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The New Privacy Battle: How the Expanding Use of Drones Continues to Erode Our Concept of Privacy and Privacy Rights

Chris Schlag



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The New Privacy Battle: How the Expanding Use of Drones Continues to Erode Our Concept of Privacy and Privacy Rights

Chris Schlag*

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INTRODUCTION

Throughout 2012 and early 2013, a major discussion developed over possible domestic drone use. In 2012, the United States planned for and approved the use of over 30,000 drones in domestic airspace.¹ Due to the drastic evolution occurring in drone technologies, law enforcement agencies such as the Environmental Protection Agency (“EPA”), Department of Homeland Security (“DHS”), and State Police Departments have all expressed interest in utilizing drones for surveillance, investigations, and arrests.² As drone technology continues to develop at an overwhelming rate, drones are quickly becoming available for domestic use. Presently, there are no specific legislative limitations on domestic drone use. Consequently, drones can be used in a manner that drastically invades individual privacy.

The Federal Aviation Administration (FAA) is tasked with ensuring the safe and orderly operation of aircrafts. Currently, the FAA controls domestic licensing of drone operations and is ultimately responsible for determining where domestic drones can be used.³ Although the FAA is certainly capable of overseeing drone technology from a technical perspective, the agency is drastically ill equipped to prevent invasions of privacy of the magnitude posed by domestic drone use. Furthermore, the ubiquity of drone technology requires a more unified and consistent approach than the various state legislative proposals that detail drone surveillance.

Part I of this article discusses the development of drone technology and analyzes the ongoing integration of drones into domestic airspace. Part II evaluates Fourth Amendment privacy issues arising out of domestic drone use, specifically within the context of surveillance and technology development. Part III examines current regulatory schemes, administrative controls, and available judicial protections. Part IV considers potential solutions to the privacy concerns raised by

¹ For the purposes of this article, the term “drone” will be used collectively to refer to both Unmanned Aerial Vehicles (UAVs) and Unmanned Aerial Systems (UASs) systems. UAVs will also be used interchangeably with drones. Naomi Wolf, *The Coming Drone Attack on America: Drones on Domestic Surveillance Duties Are Already Deployed in Police and Corporations. In Time They Will Likely Be Weaponized*, THE GUARDIAN (Dec. 21, 2012, 2:36 PM), <http://www.guardian.co.uk/commentisfree/2012/dec/21/coming-drone-attack-america>.

² RICHARD M. THOMPSON II, R42701, DRONES IN DOMESTIC SURVEILLANCE OPERATIONS: FOURTH AMENDMENT IMPLICATIONS AND LEGISLATIVE RESPONSES (2012), available at <http://www.fas.org/sgp/crs/natsec/R42701.pdf>.

³ 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, 674 (2009).

domestic drone use. Additionally, Part IV argues that the FAA and state legislative enactments alone fail to guard against privacy invasions from both publically and privately operated domestic drones. Finally, Part V concludes the Note by summarizing the necessity of a baseline federal consumer protection law. Such legislation would ensure drone-use practices by law enforcement agencies or private parties do not violate reasonable expectations of privacy.

I. DRONE USE: THEN AND NOW

Drones are aircraft uniquely designed to operate without a pilot by either a platform system or remote computer system.⁴ Drones are hardly a novel concept, as they have trended in design and utilization since World War I.⁵ Since the 1930s, a variety of drone designs have developed emphasizing different shapes, sizes and technological purposes.⁶ Although drones were primarily developed for military use, the confluence of changing technology, relatively inexpensive products, and ease of licensing has led to drone use expanding into civilian applications.⁷

A. Historical Drone Use

In 1935, technologists developed the first operational remote pilot vehicle (RPV) in response to the significant population loss and high rates of injury that occurred during close combat missions in World War I.⁸ The first RPV showed

⁴ *Unmanned Aerial Vehicles*, THE UAV, <http://www.theuav.com> (last visited Mar. 11, 2013) (The UAV, as defined, is capable of being controlled in sustained flight. Powered flight is generally obtained using a jet or reciprocating engine. While technically a cruise missile could be considered a UAV under this definition, missiles are treated separately because the vehicle itself is a weapon. UAV has expanded in many cases to the new acronym of UAVS (Unmanned Aircraft Vehicle System) to replicate the idea that often entire systems are setup around the use of the drone.); *see also Unmanned Aircraft System Questions and Answers*, THE FED. AVIATION ADMIN. (FAA) (Oct. 14, 2011, 11:08 AM), http://www.faa.gov/about/initiatives/uas/uas_faq/ (The FAA has adopted the acronym UAS (Unmanned Aircraft System) to specifically show that these complex systems often include grounding stations, remote controls, ports, and other elements besides the actual air vehicles).

⁵ For example, one of the first jet-powered target drones, developed for surveillance and reconnaissance during war efforts, was developed by Ryan Aeronautical in the early 1950s. *See Historical Overview*, RYAN AERONAUTICAL, <http://www.ryanaero.org/history.html> (last visited Feb. 18, 2013).

⁶ *See, e.g., Sarah Wilson, Advanced Technology Includes Spy Drones the Size of Bumblebees and Shape of Mosquitoes*, UNEXPLAINABLE.NET (Mar. 8, 2013), <http://www.unexplainable.net/info-theories/advanced-technology-includes-spy-drones-the-size-of-bumblebees-and-shape-of-mosquitos.php> (discussing how drone technology has advanced beyond aircraft sized drones to include drones the size of bumblebees).

⁷ Harley Geiger, *The Drones Are Coming*, CENTER FOR DEMOCRACY & TECH. (Dec. 21, 2011), <https://www.cdt.org/blogs/harley-geiger/2112drones-are-coming>.

⁸ *Advancement of the Unmanned Aerial Vehicles (UAV) and Their Role in the U.S. Military*, MILPAGES (July 28, 2011), <http://www.milpages.com/blog/582>. *See also* Martin E. Dempsey, *Eyes of*

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considerable potential in a wide array of military applications. Therefore, airplane military technologists continued to develop RPVs through World War II.⁹ To prevent loss of life during contentious attack missions over enemy land, these RPVs were designed with anti-aircraft guns.¹⁰ After World War II, private companies took over drone technology development and created model remote-controlled airplanes.¹¹ Despite the new and unsophisticated nature of remote control technology, the United States military used remote controlled airplanes in tactical missions well in advance of the Vietnam War.¹²

In 1959, the United States Air Force planned its first unmanned flights over hostile territory.¹³ After several missions in the Soviet Union during the 1960s, a highly-classified UAV program developed.¹⁴ Thereafter, the United States routinely deployed UAVs for combat missions during the Vietnam War.¹⁵ Approximately 3,434 UAV missions were flown during the Vietnam War.¹⁶ While the majority of these missions were successful, the military suffered an expensive loss through the destruction of 554 UAVs.¹⁷ Even though the loss of UAVs was significant, military leaders viewed drone use positively because their use prevented a potentially extensive loss of human life.¹⁸ At the conclusion of the

the Army—U.S. Army Roadmap for Unmanned Aircraft Systems 2010–2035, UNITED STATES ARMY, Historical Background Section 2.3, <http://www-rucker.army.mil/usaace/uas/US%20Army%20UAS%20RoadMap%202010%202035.pdf> (last visited Mar. 11, 2013).

⁹ *Advancement of the Unmanned Aerial Vehicles (UAV) and Their Role in the U.S. Military*, *supra* note 8.

¹⁰ Dempsey, *supra* note 8, at Goals and Objectives Section 2.8 (discussing how drones have been developed specifically for the goal of preventing military casualties).

¹¹ *See generally supra* note 9.

¹² *Id.* Remote controlled airplanes and RPVs are now commonly referred to as drones. *See* Jeff Prestridge, *UAVs Unmanned Aerial Vehicles*, EMPOWER NETWORK (Nov. 11, 2012), <http://www.empowernetwork.com/jeffssuccess/uavs-unmanned-aerial-vehicle>. *See also* RC Airplane, *The World of Aerospace*, <http://theknowledgeworld.com/world-of-aerospace/RC-Airplane.htm> (last visited Apr. 17, 2013) (describing remote controlled airplanes).

¹³ *Unmanned Vehicles—Aerial—UAV*, UNMANNED VEHICLES, <http://www.unmannedvehicles.co.uk/unmanned-vehicles-aerial-ua/> (last visited Apr. 17, 2013) (discussing the interest of the United States Air force in using drones to limit loss of life during critical missions over hostile territory).

¹⁴ WILLIAM WAGNER, *LIGHTNING BUGS AND OTHER RECONNAISSANCE DRONES: THE CAN-DO STORY OF RYAN'S UNMANNED SPY PLANES 78–79* (Armed Forces Journal Int'l with Aero Publishers, Inc. 1982).

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.* at 208.

Vietnam War, the United States' participation in drone development decelerated.¹⁹ Still, during the 1960s and 1970s, the United States participated in an estimated 34,000 surveillance flights using the AQM-34 Ryan Firebee.²⁰ In addition to their use in Vietnam, the United States also used UAVs for missions in China throughout the 1970s.²¹

In 1973, Israel assumed a leading role in drone technology development by introducing the first modern UAV.²² Israel pioneered UAV use for “real-time surveillance, electronic warfare and decoy[s]” with the development of both predator and scout drones.²³ Employing the recently developed predator drone, Israel neutralized Syrian air defenses in the Yom Kippur War and simultaneously spurred global interest in drone technology development.²⁴

During the 1980s and 1990s, the United States renewed its interest in drone technologies.²⁵ By this time, drones had begun to mature, miniaturize, and expand in potential applications.²⁶ The evolution of predator and scout drones led to new applications for drones in military settings.²⁷ Recognizing the expanding technological potential of drones, the United States Department of Defense (“DOD”) spent more than \$3 billion on UAV research during the 1990s.²⁸ With this investment, the DOD hoped to create a drone capable of efficient surveillance, imaging, and aerial attacks.²⁹ During the Kosovo Conflict in 1999, the military’s

¹⁹ *Warplanes: Russia Buys a Bunch of Israeli UAVs*, STRATEGY PAGE (Apr. 9, 2009), <http://www.strategypage.com/htmw/htairfo/articles/20090409.aspx>.

²⁰ *Id.* (The firebee is a small UAV that is launched by a host plane and then controlled by that plane’s operators).

²¹ *Id.*

²² Charles Levinson, *Israeli Robots Remake Battlefield*, WALL ST. J. (Jan. 13, 2010), <http://online.wsj.com/article/SB126325146524725387.html> (discussing Israel’s interest in developing drones for the specific purpose of finding Syrian forces during the Yom Kippur War).

²³ Pierre Klochendler, *Drone Technology Takes Off*, INTER PRESS SERVICE NEWS AGENCY (Mar. 29, 2012), <http://www.ipsnews.net/2012/03/drone-technology-takes-off/>. See also *MQ-1B Predator Drone Fact Sheet*, U.S. AIR FORCE (Jan. 12, 2012), <http://www.af.mil/information/factsheets/factsheet.asp?fsID=122> (describing the technical aspects of the MQ-1B Predator drone).

²⁴ Levinson, *supra* note 22.

²⁵ WAGNER, *supra* note 14, at 208.

²⁶ *Id.*

²⁷ William Matthews, *Smaller, Lighter, and Cheaper: New Missiles Are ‘Absolutely Ideal’ for Irregular Warfare*, DEFENSE NEWS (May 31, 2010, 6:00 AM), <http://www.defensenews.com/article/20100531/DEFBEAT01/5310311/Smaller-Lighter-Cheaper>.

²⁸ *Id.*

²⁹ *Id.*

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use of UAVs flourished.³⁰ More than one dozen drones were relentlessly utilized for surveillance operations.³¹ Following the Kosovo Conflict, the United States' drone use greatly increased. As part of the U.S. War on Terror, drones have become a common tool for surveillance, reconnaissance, remote attacks, and targeting in Iran, Afghanistan, and Pakistan.³²

B. Drone Technological Developments

UAVs are now widely recognized as an efficient and affordable military tool because of their successful use in the Vietnam War, Yom Kippur War and the War on Terror.³³ With demonstrated success in military applications, drone technologists have focused on expanding drone capabilities to perform more diverse functions.³⁴ Consequently, UAVs are now available in a variety of sizes, ranging from extremely small Nano drones to the considerably large aircraft sized drones.³⁵ Drones can also be modified to include various technological features, each meant for a specific purpose, such as reconnaissance or surveillance.³⁶ Drone technologies have developed in several different purpose areas, which include: remote sensing, aerial surveillance, transportation, scientific research, weaponry, and search and rescue.³⁷ The multitude of drone capabilities has spurred an interest in using drones domestically.

³⁰ *Id.*

³¹ *Id.*

³² Andrew Callam, *Drone Wars: Armed Unmanned Aerial Vehicles*, 18 INT'L AFF. REV. 3 (Winter 2010), available at <http://www.iar-gwu.org/node/144>.

³³ *Id.*

³⁴ U.S. DEPARTMENT OF DEFENSE, FY2011–2036, UNMANNED SYSTEMS INTEGRATED ROADMAP (2010), available at <http://www.defenseinnovationmarketplace.mil/resources/UnmannedSystemsIntegratedRoadmapFY2011.pdf>.

³⁵ See JEREMIAH GERTLER, CRS R42136, U.S. UNMANNED AERIAL SYSTEMS (2012), available at <http://www.fas.org/sgp/crs/natsec/R42136.pdf>.

³⁶ *Id.* See also King Aeronautics & Astronautics Consulting, *Study for the Advancement of Unmanned Aircraft Systems in Southern New Jersey*, SOUTH JERSEY ECON. DEV. DISTRICT, <http://www.sjedd.com/pdf/unmannedStudy.pdf> (last visited Feb. 17, 2013).

³⁷ See generally Mitch Joel, *The Booming Business of Drones*, HARV. BUS. REV. (Jan. 4, 2013 9:00 AM), http://blogs.hbr.org/cs/2013/01/the_booming_business_of_drones.html.

1. Remote Sensing

Remote sensing has been a primary focus in drone technological development because it has both military and civil applications.³⁸ Remote sensors can detect certain biological, chemical or physical factors in a specific area from extreme distances.³⁹ Specific types of remote sensors include: electromagnetic spectrum sensors, gamma ray sensors, biological sensors, or chemical sensors.⁴⁰ Utilizing one or multiple methods of sensory detection, remote sensing drones can perceive light changes on the visual spectrum, take pictures using infrared or near infrared cameras, identify airborne microorganisms and biological factors, and detect chemical atmospheric changes.⁴¹

2. Aerial Surveillance and Transportation

Aerial surveillance is a principal function of drones in both military and civil operations.⁴² Therefore, development of aerial surveillance technology is a primary focus.⁴³ Drone surveillance features include technologies such as automated object detection, GPS surveillance, gigapixel cameras,⁴⁴ and enhanced image resolution.⁴⁵

³⁸ See generally U.S. Department of State, *Technology Alert List*, U.S. DEPT. OF STATE (Aug. 2002), available at <http://www.bu.edu/isso/forms/tal.pdf> (describing specific technological developments that can be used for both military and civil applications).

³⁹ Andrea S. Laliberte et al., *Multispectral Remote Sensing from Unmanned Aircraft: Image Processing Workflows and Applications for Rangeland Environments*, REMOTE SENS., Nov. 18, 2011, available at http://www.mdpi.com/journal/remotesensing/special_issues/uav. The size variation, purpose and capabilities of the specific drone technology used will significantly impact the distance from which a drone can detect remote factors. For example, depending on the technological capabilities of the remote sensor, a drone could be over a mile away and still obtain clear data on the physical environment of a targeted location. See generally Javier Irizarry et al., *Usability Assessment of Drone Technology as Safety Inspection Tools*, J. INFO. TECH. IN CONSTRUCTION (Sept. 2012), available at http://www.itcon.org/data/works/att/2012_12.content.09869.pdf.

⁴⁰ Robert Sanderson, *Introduction to Remote Sensing*, N.M. SPACE GRANT CONSORTIUM, ftp://ftp.wsl.ch/downloads/babst/Fernerkundung_WS2012/literatur/remote_sensing.pdf (last visited Feb. 17, 2013).

⁴¹ Susan Karlin, *NOVA's "Rise of the Drones" Looks at the Troubling World of Unmanned Flight*, CO.CREATE, Jan. 23, 2013, <http://www.fastcreate.com/1682269/nova-s-rise-of-the-drones-looks-at-the-troubling-world-of-unmanned-flight#1>.

⁴² See *Unmanned Aerial Vehicles*, *supra* note 4.

⁴³ See *id.*

⁴⁴ Joshua Kopstein, *DARPA's 1.8 Gigapixel drone camera is a high-res Fourth Amendment lawsuit waiting to happen*, THE VERGE, <http://www.theverge.com/2013/2/1/3940898/darpa-gigapixel-drone-surveillance-camera-revealed> (Gigapixel cameras are high definition cameras, which can be employed to obtain "real-time" video streams. A drone that is equipped with a gigapixel camera can track up to sixty-five different targets across a distance of sixty-five square miles. Gigapixel cameras can also be modified with infrared sensors, GPS, movement detectors, and automated license plate readers. Continued technological development of gigapixel cameras is expected to result in the ability to obtain facial recognition).

Due to its relative cost effectiveness, drone aerial surveillance has quickly become the most efficient tool for monitoring livestock movements, mapping wildlife habitats, maintaining property security, performing road patrols, and combating piracy, among others.⁴⁶ Aerial surveillance drones are also commonly able to transport objects.⁴⁷ The configuration and size of the drone determines the size of the object that can be transported.⁴⁸ Many drone models permit transportation of objects through enclosing the item in a small compartment on the drone, attaching an object to the frame, or through an external attachment of an aerodynamic pod.⁴⁹

3. Weaponry

Drones originally evolved to provide a cost effective military tool that would permit easy elimination of military targets without undue loss of life.⁵⁰ Developing weaponry capable of achieving this goal has been a crucial focus.⁵¹ The most commonly known weaponized military drone is the MQ-1 Predator.⁵² This drone comes equipped with missiles for both aerial and ground based missions.⁵³ Building on the successful application of missile use with MQ-1 Predator model, technologists have developed drone weapons for closer combat such as guns, tear gas holder cells, rubber bullets, and lasers.⁵⁴ Drones armed with close combat

⁴⁵ For an example of a cheap aerial surveillance drone, see Hack N' Mod, *Aerial Surveillance Drone Launched from a Mailbox*, HACK N'MOD, <http://hacknmod.com/hack/aerial-surveillance-copter-launched-from-a-mailbox/> (last visited Mar. 11, 2013) (This helicopter drone is capable of autonomous launch, flight and landing all from a mailbox sized hangar. The battery-operated drone has navigation, landing and real time surveillance footage capabilities).

⁴⁶ *Domestic Unmanned Aerial Vehicles (UAVs) and Drones Technical Capabilities*, ELECTRONIC PRIVACY INFO. CENTER, <http://epic.org/privacy/drones/#tech> (last visited Mar. 11, 2013) [hereinafter ELECTRONIC PRIVACY INFO. CENTER].

⁴⁷ *Id.*

⁴⁸ *Unmanned Aerial Vehicles*, *supra* note 4.

⁴⁹ *Id.*

⁵⁰ Sal Bommarito, *Domestic Drones in America: 5 Reasons the FBI Should Use Drones*, POLICYMIC, <http://www.policymic.com/articles/10894/domestic-drones-in-america-5-reasons-the-fbi-should-use-drones> (last visited Mar. 11, 2013) (expressing preference for drones in combat situations because they reduce American casualties).

⁵¹ *Id.*

⁵² See *MQ-1B Predator Drone Fact Sheet*, *supra* note 23.

⁵³ *Id.*

⁵⁴ Roy Carroll, *Drone Warfare: A New Generation of Deadly Unmanned Weapons*, THE GUARDIAN (Aug. 2, 2012, 11:40 PM), <http://www.guardian.co.uk/world/2012/aug/02/drone-warfare-unmanned-weapons>.

weapons permit crowd control, riot prevention, and security.⁵⁵ Weaponized drones are the preferred military tool for overseas operations, because of the many weaponized modifications that can be employed.⁵⁶ In just ten years, the Pentagon increased its fleet of military-grade-drones from fewer than 50 to over 7,000.⁵⁷

4. Search and Rescue

UAVs recently have become a popular tool for search and rescue operations, as UAVs can be equipped with optical sensors, infrared cameras, synthetic aperture radars, all weather sensors, cameras, laser radar (LADAR), license plate readers, and GPS devices.⁵⁸ UAVs are uniquely capable of penetrating areas that may be too dangerous for a piloted craft or individuals on foot.⁵⁹ For this reason, UAVs are ideal for search and rescue operations over the ocean, during extreme atmospheric storms, and in thick wilderness settings.⁶⁰

C. Domestic Drone Use

The many utilities and relative cost of drones has led federal, state, and local departments to express an interest in using drones domestically.⁶¹ Within the past six years, DHS has spent over \$250 million purchasing ten surveillance Predators

⁵⁵ Judith Scherr, *Drones Come Home, to U.S. Privacy Activists' Dismay*, INTER PRESS SERVICE NEWS AGENCY (Dec. 7, 2012), <http://www.ipsnews.net/2012/12/drones-come-home-to-u-s-privacy-activists-dismay/> (Noting drones equipped with tear gas and rubber bullets can be used for crowd control, security purposes and riot control). See also Naomi Wolf, *The Coming Drone Attack on America: Drones on Domestic Surveillance Duties are Already Deployed in Police and Corporations. In Time They Will Likely Be Weaponized*, THE GUARDIAN (Dec. 21, 2012 2:36 PM), <http://www.guardian.co.uk/commentisfree/2012/dec/21/coming-drone-attack-america>.

⁵⁶ Paul Rosenzweig et al., *Drones in U.S. Airspace: Principles for Governance*, THE HERITAGE FOUNDATION (Sept. 20, 2012), available at <http://www.heritage.org/research/reports/2012/09/drones-in-us-airspace-principles-for-governance>.

⁵⁷ *Id.*

⁵⁸ See *Search and Rescue Drone: AeroVironment and Search and Rescue Drone*, AEROVIRONMENT, http://www.avinc.com/glossary/search_and_rescue_drone (last visited Mar. 11, 2013).

⁵⁹ See generally Air University, *Leveraging the Infosphere: Surveillance and Reconnaissance in 2020*, AIRPOWER J. (Summer 1995), available at http://www.airpower.au.af.mil/airchronicles/apj/apj95/sum95_files/spacast1.htm.

⁶⁰ Drones can also be effective tools for scientific research during storms, in volcanoes and in arctic work because they can be designed with temperature shields, which withstand changes in barometric pressure and changes in weather conditions. See generally *id.*

⁶¹ Sara Sorcher, *Why Americans—and everyone else—will want drones in the skies*, QUARTZ (Mar. 8, 2013), <http://qz.com/60760/drones-in-the-skies/>.

specifically equipped with video cameras, infrared cameras, sensors, and radar.⁶² These drones will be used for patrol operations of U.S. borders and for prevention of international smuggling.⁶³

Other agencies have followed DHS's lead and considered purchasing drones for agency operations. The Federal Bureau of Investigation ("FBI"), DOD, Immigrations and Customs Enforcement ("ICE"), the United States Secret Service, and EPA have all introduced proposals for drones to be integrated into agency operations.⁶⁴

Many state departments and local law enforcement offices have also purchased or financed drones for various purposes.⁶⁵ For example, state departments in Virginia and Florida have expressed an interest in purchasing small drone vehicles for surveillance missions.⁶⁶ Additionally, local law enforcement offices in Montgomery, Texas; Seattle, Washington; and Gadsden, Alabama; have already implemented drones in some enforcement operations.⁶⁷ Although the majority of police departments intend to use the drones for surveillance and reconnaissance missions only, one police department in North Dakota has already raised the bar by using a drone for assistance during an arrest.⁶⁸ Additionally, some police departments have expressed an interest in using drones for search and rescue operations, and traffic accident scene mapping.⁶⁹ Drones are certainly an affordable

⁶² Trevor Timm, *DHS to Double US Drone Fleet*, ELECTRONIC FRONTIER FOUND. (Nov. 22, 2012), <http://readersupportednews.org/news-section2/335-156/14672-dhs-to-double-us-drone-fleet>.

⁶³ *Id.* See also Andrew Becker, *U.S. Border Drones Deal with General Atomics Aeronautical Systems Inc., Draws Criticism*, CALIFORNIA WATCH (Nov. 19, 2012 11:46 AM), http://www.huffingtonpost.com/2012/11/19/us-border-drone-deal-wit_n_2159255.html.

⁶⁴ THOMPSON II, *supra* note 2.

⁶⁵ Geiger, *supra* note 7.

⁶⁶ *Drones in the United States—An Analysis*, BEAR WITNESS CENTRAL (Feb. 10, 2013), <http://bwcentral.org/2013/02/drones-in-the-united-states-an-analysis/>.

⁶⁷ *Id.*

⁶⁸ Mark Brunswick, *Spies in the sky signal new age of surveillance*, STARTRIBUNE (July 22, 2012, 6:26 AM), available at <http://www.startribune.com/local/163304886.html?refer=y>. Some state and local officials have expressed interest in employment of drones for public safety and law enforcement purposes. See, e.g., Brianna Carter, *Gov. Bob McDonnell supports drones policing Virginia*, ABC NEWS (May 30, 2012), available at <http://www.wjla.com/articles/2012/05/gov-bob-mcdonnell-supports-drones-policing-virginia-76464.html>.

⁶⁹ Kevin Johnson, *Police Chiefs urge Limits on Use of Drones*, USA TODAY (Sept. 7, 2012, 12:45 AM), <http://usatoday30.usatoday.com/news/nation/story/2012-09-06/cop-%20drones/57639048/1>.

option for these departments because drones are cheaper, easier to purchase, and easier to maintain than the usual resource of helicopters.⁷⁰

Domestic drone use is not limited to the public sphere. Many privately owned companies already use or have expressed interest in obtaining drones for security, loss prevention, and other various purposes.⁷¹ For example, Google currently uses drones to obtain map data, build GPS databases, and develop Internet-based street view maps.⁷² Multiple commercial media agencies have also tried to acquire drones to collect private information, video images, and pictures of celebrities.⁷³ Private detective agencies, lawyers, bail bondsmen, insurance companies, and media groups such as National Geographic, have all staked a claim in the development of affordable drone technology.⁷⁴ This is due to the enhanced imaging capabilities, affordable surveillance options, GPS tracking, and targeting of drones, which would allow for the collection of information useful to these trades in a relatively inconspicuous way.⁷⁵

While presently, domestic drone use is seen as inconsequential because the technology is relatively unfamiliar and infrequently used, domestic drone use is projected to drastically increase in upcoming years.⁷⁶ The drone industry is

⁷⁰ *Id.* (States that the benefits of police using drones come from the possible weight being as little as five pounds with a cost around \$30,000 to \$50,000, instead of the more expensive \$3 million helicopter).

⁷¹ See generally Ann Zaniewski, *As Drone Use Grows, So Do Privacy, Safety Concerns*, USA TODAY (Mar. 7, 2013 1:00 AM), <http://www.usatoday.com/story/news/nation/2013/03/07/drone-use-raises-privacy-safety-concerns/1969653/>.

⁷² ELECTRONIC PRIVACY INFO. CENTER, *supra* note 46. See also *GIS and Geoweb Aggregator*, GOOGLE MAPIFY, http://gmapify.fr/blogs_aggregator.php5 (last visited Mar. 11, 2013).

⁷³ ELECTRONIC PRIVACY INFO. CENTER, *supra* note 46.

⁷⁴ *Id.* See also Bryan McKenzie, *McKenzie: Drones are Here, and Not too Expensive*, THE DAILY PROGRESS (Feb. 17, 2013 7:01 PM), http://www.dailyprogress.com/news/columnists/article_4f810398-795e-11e2-b598-0019bb30f31a.html (demonstrating that a private citizen and corporation can easily purchase an autonomous and radio-controlled drone equipped with both video cameras and equipment starting out at just \$500.00); John Hollenhorst, *Eye in the Sky: Military Drones Technology Application in Civilian World*, DESERET NEWS (May 5, 2012, 10:15 PM), <http://www.deseretnews.com/article/765573959/Eye-in-the-Sky-Military-drones-technology-has-application-in-civilian-world.html?pg=all> (noting National Geographic, Hollywood, Google Earth and the Summer Olympic Games series have already looked at drone use for obtaining photographs and real time video footage of events).

⁷⁵ McKenzie, *supra* note 74.

⁷⁶ *Id.* (The FAA has had to increase staffing in order to keep up with the mounting demand for government licenses. In late 2010, there were 273 active government licenses, nearly 100 more than the previous year. Reports in 2012 demonstrate that the FAA has issued more than 300 drone licenses. Only minimal information has been released on the nature and function of these drones).

currently a \$6 billion industry and is expected to double in the next 10 years.⁷⁷ In February 2012, Congress enacted the FAA Modernization and Reform Act, which specifically calls for the acceleration and integration of drones into United States national airspace by 2015.⁷⁸ As a result of the FAA's initiative under the Act and the significant push from federal and state agencies to use drones domestically, the FAA is expected to approve an additional 30,000 licenses for domestic drone operation by 2020.⁷⁹

II. FOURTH AMENDMENT PRIVACY ISSUES RAISED BY DOMESTIC DRONE USE

The unique size, agility, surveillance capabilities, and cost effectiveness of drones, makes them an incredibly appealing tool for surveillance and the prevention or prosecution of a crime in both the private and public sphere. Furthermore, because drones are often quiet and can fly at significant heights, often remaining invisible to the naked eye, drone use raises concerns of individual privacy violations.

A. *The Fourth Amendment's Protection of Privacy Rights*

Under the Fourth Amendment, Americans are guaranteed a certain degree of privacy through the right “to be secure in their persons, houses, papers, and effect against unreasonable searches and seizures.”⁸⁰ This constitutional right to privacy prevents excessive government intrusion by prohibiting law enforcement from implementing “unreasonable searches and seizures” in the course of investigations or police operations.⁸¹

The Fourth Amendment's applicability to emerging technologies has long been the subject of debate.⁸² This debate has been particularly volatile over technologies developed in the twentieth century, for which the Constitutional

⁷⁷ Bommarito, *supra* note 50.

⁷⁸ FAA Modernization and Reform Act of 2012, *Conference Report to Accompany H.R. 658* (Feb. 1, 2012), available at <http://www.gpo.gov/fdsys/pkg/CRPT-112hrpt381/pdf/CRPT-112hrpt381.pdf>.

⁷⁹ See generally Geiger, *supra* note 7.

⁸⁰ U.S. CONST. amend. IV.

⁸¹ *Id.*

⁸² See, e.g., *Olmstead v. United States*, 277 U.S. 438 (1928) (Brandeis, J., dissenting) (“Subtler and more far-reaching means of invading privacy have become available to the government. Discovery and invention have made it possible for the government, by means far more effective than stretching upon the rack, to obtain disclosure in court of what is whispered in the closet.”).

founders could not have envisioned a protection.⁸³ Although drones can certainly be used beneficially in society, their use raises monumental privacy concerns.⁸⁴ These Fourth Amendment privacy concerns should be addressed prior to domestic drone implementation.

The Supreme Court has outlined the protection of an individual's privacy in several influential cases. In a 1967 case, *Katz v. United States*, the Court outlined the parameters of an unreasonable search.⁸⁵ In determining the action of wiretapping a telephone booth was an actual search, the Court ruled that a search occurs when a person has an expectation of privacy in the thing searched.⁸⁶ The Court reasoned because the Fourth Amendment protects people and not property, and Charles Katz expected his phone booth conversation to be private, the police had performed a search of Katz's conversation in violation of his Fourth Amendment right to privacy.⁸⁷

Following *Katz*, the Supreme Court evaluated the first aerial surveillance case in *California v. Ciarolo*.⁸⁸ In *Ciraolo*, the Supreme Court held the warrantless aerial observation of a fenced-in backyard within the curtilage of the home was a reasonable search under the Fourth Amendment.⁸⁹ In determining the homeowner did not have a reasonable expectation of privacy from air surveillance the Court considered the observed area's location.⁹⁰ The Court determined the search was reasonable because even though the homeowner had a privacy fence, the marijuana foliage in his backyard was clearly visible and regularly exposed to overhead flights.⁹¹

In *Dow Chemical v. United States*, the Supreme Court extended authority to law enforcement officers flying over private commercial areas.⁹² The Court held that the EPA had statutory authority to use aerial photography to perform "site

⁸³ See, e.g., *Kyllo v. United States*, 533 U.S. 27, 37 (2001).

⁸⁴ The beneficial uses of drones include agricultural monitoring, search and rescue, and scientific development. See Bommarito, *supra* note 50.

⁸⁵ *Katz v. United States*, 389 U.S. 347 (1967).

⁸⁶ *Id.* at 352.

⁸⁷ *Id.*

⁸⁸ *California v. Ciraolo*, 476 U.S. 207 (1986).

⁸⁹ *Id.*

⁹⁰ *Id.*

⁹¹ *Id.* at 212–13.

⁹² *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986).

inspections” under the Clean Air Act.⁹³ The Court further held that aerial photography of a chemical company’s industrial complex was not a “search” for Fourth Amendment purposes.⁹⁴ While a warrant would have been required for a physical search of the industrial complex, the Court determined a warrant to photograph the openly visible area of the complex was unnecessary.⁹⁵ As the industrial complex was more comparable to an open field, visibly observable from public airspace, the Court reasoned the company did not have a reasonable expectation of privacy.⁹⁶

In *Kyllo v. United States*, the Supreme Court held that the use of sense-enhancing technology to gather information regarding the interior of the home, which could not be obtained without an intrusion into a constitutionally protected area, was a “search” under the Fourth Amendment.⁹⁷ The Court further held use of thermal imaging to measure heat emanating from the home was a search.⁹⁸ Applying the *Katz* test, the Court determined the use of radars and sense-enhancing technology to gather information about activities occurring within the home was an invasion of an individual’s reasonable expectation of privacy.⁹⁹ In reaching this conclusion, the Court specifically noted heightened privacy interests surrounding the home.¹⁰⁰ The Court reasoned because sense enhancing technology was not available for general public use, individuals could not reasonably expect that they would need to protect their privacy interests from this type of technology.¹⁰¹

Most recently in *United States v. Jones*, the Supreme Court modified the *Katz* standard by holding the attachment of a Global Positioning System (GPS) tracking device to a vehicle, and subsequent use of the GPS to monitor the vehicle’s movements on public streets, was a search within the meaning of the Fourth Amendment.¹⁰² The Court determined the attachment of the GPS device to Jones’ car without his consent was not only a trespass but also a search of personal

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.* at 239.

⁹⁶ *Id.*

⁹⁷ *Kyllo v. United States*, 533 U.S. 27, 37 (2001).

⁹⁸ *Id.*

⁹⁹ *Id.* at 28.

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² *United States v. Jones*, 132 S. Ct. 945 (2012).

property.¹⁰³ Without rejecting *Katz* or the reasonable expectation to privacy inquiry, the Court relied on property rights as a basis for Fourth Amendment privacy protection.¹⁰⁴ As Jones had a personal property right attached to his vehicle, the Court reasoned a physical intrusion of that property through attachment of a GPS constituted a search.¹⁰⁵

B. Applying the Privacy Protections Outlined by the Supreme Court to Domestic Drones

The essence of Fourth Amendment privacy protection arises out of the requirement that a search or seizure be “reasonable.” The main question then becomes: what exactly is reasonable? With issues of emerging technologies, the answer is not readily apparent. A significant problem that blurs the analysis of what is reasonable is the prevalence and understanding of technology in society. In application, *Katz*’s reasonable expectation of privacy test leaves a significant gap between society’s understanding of existing technology and the technology’s availability for use.¹⁰⁶ The Supreme Court even discussed this gap in *Kyllo* by emphasizing that because sense-enhancing technology used to peer inside the home was “not in general public use,” individuals could not have expected the technology to be used for that purpose.¹⁰⁷

While the general public does not necessarily engage in drone use, drones can be purchased relatively easily.¹⁰⁸ The public is also clearly aware of the military’s extensive use of drones.¹⁰⁹ Applying the *Katz* test and *Kyllo* reasoning to the issue of domestic drone use, an important question surfaces: has the availability of drones for general use, combined with public knowledge of drone operation destroyed society’s privacy expectations to the degree that individuals have no reasonable expectation of privacy from drone surveillance?

The largest privacy concern arising out of drone use is the drone’s ability to operate as a powerful, inconspicuous, and autonomous surveillance tool. Just as the

¹⁰³ *Id.*

¹⁰⁴ *Id.* at 949. *Cf.* *Katz v. United States*, 389 U.S. 347, 361 (1967) (holding “the Fourth Amendment protects people, not places”).

¹⁰⁵ *Id.*

¹⁰⁶ *See supra* Part II-A. *See also* *Katz v. United States*, 389 U.S. 347, 360 (1967) (Harlan, J., concurring).

¹⁰⁷ *See supra* Part II-A.

¹⁰⁸ *See supra* Part I-C.

¹⁰⁹ Hollenhorst, *supra* note 74 (“The public is well aware of unmanned aerial drones, those military eyes in the sky that can pick out targets and track down terrorists”).

sense-enhancing technology in *Kyllo* was used to peer through walls, UAVs can be easily modified to carry high-megapixel cameras, infrared cameras, and thermal imaging; thereby making a wall completely inconsequential.¹¹⁰ As these technologies are not necessarily in general public use, law enforcement's use of them would likely trigger Fourth Amendment protections under *Kyllo*.¹¹¹ However, because the general public can actually purchase the technology relatively easily, drone technology may be considered more pervasive than originally believed.¹¹² Furthermore, even if drones cannot be used to obtain information about a person's in-home activities, surveillance drones flying in open view or in public airspace would likely not be protected under the Fourth Amendment, because the Supreme Court has already said there is no reasonable expectation of privacy in these areas.¹¹³ Similarly, use of drones equipped with low-powered cameras or other unsophisticated technology for surveillance purposes would also not raise privacy concerns under the Fourth Amendment, as items in "plain view" do not trigger privacy protection.¹¹⁴

The inconspicuous, efficient, and cheap surveillance method that drones provide raises a very similar issue to that seen in *United States v. Jones*. In *Jones*, the Supreme Court expressed concern over the availability and reduced pricing of GPS monitoring, which would allow for easier GPS tracking of individuals without their knowledge.¹¹⁵ Drones also provide long-term GPS capabilities that can be performed without actually coming in contact with an individual's person or property.¹¹⁶ Furthermore, drones pose a huge concern to individual privacy rights because drones are inexpensive, come equipped with real-time recording, and

¹¹⁰ See THOMPSON II, *supra* note 2.

¹¹¹ *Id.* (stating that surveillance drones, which have the capacity and ability to see through walls and ceilings, would likely trigger Fourth Amendment protections).

¹¹² See, e.g., *GSM Drone Remote Surveillance Sys. DRN-DRNSYS1*, AMAZON.COM, <http://www.amazon.com/GSM-Drone-Remote-Surveillance-DRN-DRNSYS1/dp/B009OE3FSW> (last visited Mar. 12, 2013) (Example of a remote control drone, which can be purchased online by anyone for only \$599.99. This drone comes with the following specifications: "60 foot capture range, NO GLO night vision IR's emit no visible light source, 8MP CAMERA Burst Mode shoots 1-9 images per trigger, Time/date/moon/temp stamp on files, GPS ENABLED, Engineered to withstand the elements with an IP54 durability rating.").

¹¹³ See *California v. Ciraolo*, 476 U.S. 207 (1986); *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986).

¹¹⁴ See *Kyllo v. United States*, 533 U.S. 27, 42 (2001).

¹¹⁵ See *United States v. Jones*, 132 S. Ct. 945, 964 (2012) (Alito, J., concurring).

¹¹⁶ See generally Barry Neild, *Not Just for Military Use, Drones Turn Civilian*, CNN (Dec. 22, 2012 1:35 PM), <http://www.cnn.com/2012/07/12/world/europe/civilian-drones-farnborough> (discussing how drones can be modified specifically for long term surveillance operations).

various types of cameras; drone surveillance permits the collection of intimate and detailed information about an individual.¹¹⁷ Left unrestrained, drone technology will develop faster than a sufficiently controlling framework can effectively manage, and take advantage of unsuspecting individuals. Equipped with cameras, GPS tracking, targeting, video surveillance, endurance scoping, infrared networking, and satellite positioning, drones can obtain pictures, videos, technological transfers,¹¹⁸ and more, all without the knowledge of the individual.¹¹⁹ As many Americans are unaware of changing drone technology use and applications in the United States, they can hardly have formulated sufficient protections to potential privacy invasions that could result from drone use.

III. LEGISLATIVE TOOLS IN PLACE TO COMBAT PRIVACY INVASIONS

The United States does not have a baseline privacy law or specific federal regulation that addresses privacy implications of domestic drone use.¹²⁰ Numerous political figures, administrative bodies, and privately interested parties, however, have proposed technology bills that, if passed, would encompass at least some of the privacy concerns raised by drones in domestic airspace.

A. Federal Legislative Protection of Privacy

The current requirements for drone operations in the United States are minimal and largely perfunctory. The only major piece of federal legislation controlling domestic drone use is the FAA Modernization and Reform Act of 2012.¹²¹ The FAA's requirements on drone use focus mainly on the safety of the aircraft itself while in a national airspace setting.¹²² Before a drone can be deployed in the United States, it must be certified as airworthy through the FAA or Department of Defense.¹²³ The FAA does, however, maintain exceptions to the

¹¹⁷ See *United States v. Jones*, 132 S. Ct. 945, 955 (2012) (Sotomayor, J., concurring) (stating that short-time surveillance of an individual may reveal very little information about them, while longer term surveillance could “reflect a wealth of detail”).

¹¹⁸ Technological transfers include transfer of cell phone data, calls, and text messages.

¹¹⁹ See *supra* Part I-B.

¹²⁰ Sorcher, *supra* note 61.

¹²¹ *Id.* See also H.R. 658.

¹²² See H.R. 658.

¹²³ *Id.* (As part of the FAA's responsibilities, the Agency must develop and implement all necessary safety studies for determining the appropriate integration of drones into national airspace. It is important to note the wording and context of the FAA Modernization and Reform Act is on drone safety, not managing privacy or civil liberties.).

general requirement of certification.¹²⁴ For example, recreational drone operators, those operating drones below 400 feet, are not required to obtain certification and are held only to a “good judgment” standard.¹²⁵

Following the enactment of the FAA Modernization and Reform Act of 2012, multiple civil rights and liberties groups raised concerns about the privacy impact of domestic drones.¹²⁶ Their efforts were not ignored, as many domestic drone use proposals were initiated for federal legislation. Under the proposed bill, Preserving Freedom from Unwarranted Surveillance Act of 2013, federal law enforcement must obtain a warrant before using a drone for surveillance purposes.¹²⁷ Another proposed bill, the No Armed Drones Act (NADA), would modify the FAA Modernization and Reform Act of 2012 to prevent armed drones from being used in national airspace.¹²⁸ Some bills, such as the National Security and Federal Lands Protection Act, ease environmental restrictions so drones can be more easily used for surveillance and border control purposes.¹²⁹ Other bills have been designed to limit and control specific agency uses. For example, the Farmers Privacy Act of 2012 restricts the EPA’s ability to use surveillance drones in agricultural monitoring.¹³⁰

Though a significant number of federal laws have been proposed to address drone use, the primary focus of these bills concerns law enforcement’s receipt of a

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ See *Groups Concerned Over Arming of Domestic Drones*, CBS (May 23, 2012 1:18 PM), <http://washington.cbslocal.com/2012/05/23/groups-concerned-over-arming-of-domestic-drones/> (discussing the ACLU’s recent statement in opposition to domestic drone use).

¹²⁷ Preserving Freedom from Unwarranted Surveillance Act of 2013, H.R. 972, 113th Cong. (2013), available at <http://www.govtrack.us/congress/bills/113/hr972/text>.

¹²⁸ Pete Kasperowicz, *House Republican proposes ban on use of armed drones in the US*, THE HILL’S FLOOR ACTION BLOG (06/18/12 10:07 AM), <http://thehill.com/blogs/floor-action/house/233175-house-republican-proposes-ban-on-use-of-armed-drones-in-the-us>.

¹²⁹ National Security and Federal Lands Protection Act, H.R.1505, 112th Cong. (2011), available at <http://www.gpo.gov/fdsys/pkg/BILLS-112hr1505rh/pdf/BILLS-112hr1505rh.pdf>. See also K.C. Mehaffey, *The National Security and Federal Land Protection Act Attacks Public Land*, THE WENATCHEE WORLD (June 19, 2012), <http://www.wenatcheeworld.com/news/2012/jun/19/national-security-bill-takes-aim-at-environmental/> (stating “The National Security and Federal Land Protection Act would allow the U.S. Border Patrol and the Department of Homeland Security to bypass 16 environmental laws—from the Endangered Species Act and the Wild and Scenic Rivers Act to the National Historic Preservation Act and the National Environmental Policy Act—within 100 miles of the U.S. border.”).

¹³⁰ David A. Fahrenthold, *Reining in the Rumors About EPA ‘Drones’*, WASH. POST (June 18, 5:05 PM), available at http://www.washingtonpost.com/politics/reining-in-the-rumors-about-epa-drones/2012/06/16/gJQAwwjkhV_story.html.

warrant prior to initiating surveillance and limiting the scope of drone use. Importantly, none of the federal bills currently proposed fully address privacy concerns. Under each of aforementioned bills, drones could still be used for surveillance purposes when there is an open and visible area, and even if to a certain degree the monitored individual has an expectation of privacy in that area. Furthermore, none of the proposed bills address private use of drones to surreptitiously collect information about individuals.

B. State Legislative Protection of Privacy

Many states have taken the initiative to propose state specific legislation about drone use within state borders.¹³¹ Florida, Montana, and Virginia were some of the first states to propose legislation in 2013, with the majority of their proposed state legislation just waiting to be signed into law.¹³² Though the states differ in their focus and goals of proposed legislation, the majority of states have proposed legislation at this time.¹³³

The argument has been made that drones are no more invasive to privacy than the standard helicopter surveillance.¹³⁴ However, a survey of proposed legislation clearly suggests that privacy during drone surveillance is actually a major concern. In a majority of proposed state bills, states want to implement, at a minimum, a probable cause requirement before law enforcement can obtain a warrant for the use of drones to collect evidence against an individual.¹³⁵ Some states' proposed legislation would ban weaponization of drones owned and operated within the state,¹³⁶ other states have focused their bills on limiting aerial surveillance of groups such as farmers and ranchers, or for specific types of crimes, such as

¹³¹ Miranda Green, *On the Home Front, Drones Are Quickly Shot Down by States*, THE BEAST (Mar. 9, 2013 4:45 AM), <http://www.thedailybeast.com/articles/2013/03/09/on-the-home-front-drones-are-quickly-shot-down-by-states.html>.

¹³² Allie Bohm, *Drone Legislation: What's Being Proposed in the States?*, ACLU (May 6, 2013, 3:15 PM), <http://www.aclu.org/blog/technology-and-liberty-national-security/drone-legislation-whats-being-proposed-states>.

¹³³ *Id.* (stating that "Drone legislation has been proposed in at least 30 states so far.").

¹³⁴ THOMPSON II, *supra* note 2.

¹³⁵ *Id.* (stating that bills in "Arizona, California, Florida, Georgia, Idaho, Illinois, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, Montana, New Hampshire, New Mexico, North Dakota, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Texas, Washington, and Wyoming" would require probable cause before drones could be used for surveillance purposes).

¹³⁶ *See, e.g.*, S.B. 200, 98th Gen. Assembly (Ga. 2013), *available at* <http://legiscan.com/GA/text/SB200/id/755795>; S.B. 1587, 98th Gen. Assembly (Ill. 2013), *available at* <http://www.ilga.gov/legislation/fulltext.asp?DocName=&SessionId=85&GA=98&DocTypeId=SB&DocNum=1587&GAID=12&LegID=72407&SpecSess=&Session>; H.B. 1556, 54th Leg. (Okla. 2013), http://webserver1.lsb.state.ok.us/cf_pdf/2013-14%20INT/hB/HB1556%20INT.PDF.

felonies.¹³⁷ Additionally, two states, Massachusetts and North Dakota, have explicitly limited drone surveillance when that surveillance implicates an individual's First Amendment protected activities.¹³⁸

State proposed legislation is a step in the right direction but is still largely insufficient in protecting all of an individual's privacy interests. Currently, none of the proposed state legislation fully addresses privacy nor provides sufficient privacy checks on third party use of drones for surveillance purposes. Under many of the proposed bills, drones can still be used by law enforcement to obtain information available in "plain view" or open space without a warrant, regardless of any existing individual expectation of privacy. Additionally, privately owned drones used for security and/or scientific purposes by third parties are not even discussed under the proposed bills.

IV. POSSIBLE SOLUTIONS TO THE DRONE CONUNDRUM

Drones create an incredibly sticky problem because, while drone technology is new, exciting, and capable of benefiting society,¹³⁹ the very nature of drones means there will always remain a potential for harm. Many proposed methods for dealing with drones only scratch the surface of necessary controls required to ensure individual privacy rights are protected.

One common theme in the federal and state legislative proposals is the requirement that law enforcement obtain area warrants or specific probable cause based warrants prior to the use of drones for aerial surveillance.¹⁴⁰ Often, the caveat to this type of legislative proposal is that a warrant is only necessary if the information collected will be used in court proceedings or criminal charges.¹⁴¹ As this requirement only prohibits surveillance by drones in a law enforcement setting, when evidence collected will be used in criminal or court proceedings, the

¹³⁷ See S.B. 1051, 62d Leg. (Idaho 2013), available at <http://legislature.idaho.gov/legislation/2013/S1051.pdf#xml=http://http://legislature.search.ida>; S.B. 196, 63rd Leg., (Mo. 2013), available at <http://data.opi.mt.gov/bills/2013/billhtml/SB0196.htm> (limiting drone surveillance of ranches and farms). See also S.B. 200, *supra* note 136 (banning drone use for misdemeanor offenses).

¹³⁸ Bohm, *supra* note 132 (providing the example that under the Massachusetts and North Dakota bills, drones could not be parked over a Mosque, an Occupy protest, or Tea Party rally, unless a warrant for the surveillance had been obtained first).

¹³⁹ See *supra*, Part I-B (discussing how drones can be an effective tool in search and rescue operations, and scientific research). See also Sorcher, *supra* note 61.

¹⁴⁰ See Preserving Freedom from Unwarranted Surveillance Act of 2013, *supra* note 127; Bohm, *supra* note 132.

¹⁴¹ See Bohm, *supra* note 132.

protection of an individual's privacy is still severely limited. Individuals may still be observed during surveillance operations that do not seek admissible evidence or by privately operated drones. This form of protection therefore provides little defense to an individual's expectation of privacy because most individuals would likely expect any long-term aerial surveillance would require a warrant, regardless of the admissibility of collected information.

Another common theme in federal and state legislative proposals is the prohibition of certain technological capabilities, such as arming drones with weapons.¹⁴² While banning the weaponization of drones would address some safety concerns related to drone use in domestic airspace, it does not address privacy concerns. In fact, the simple ban on weaponized drones may actually deteriorate the general public's understanding of acceptable drone use, to the extent that individuals fail to take precautions to safeguard their privacy interests. For example, if individuals know weaponized drones are prohibited, they may expect a drone equipped with infrared lasers would be banned, but because infrared lasers are not technically considered a weapon, a drone equipped with them would be permissible. The individual's failure to recognize the continued application of infrared cameras on drones because of the expected ban could result in a failure to understand and take precautions against infrared cameras being used to take night-time photographs, perform heat sensing functions, or peer through physical barriers.

A solution to the overall privacy concerns raised by drones, which has not been proposed in either federal or state legislation, would be to develop a baseline consumer protection law that details permissible uses of drones in domestic airspace by both law enforcement agencies and private parties. A specifically developed consumer protection agency or a created body within the FAA dedicated solely to drone technology would be responsible for implementing and overseeing compliance with the law. A baseline consumer protection law would need to address drone surveillance, data collection, and the various drone technological capabilities. While it would be impossible to develop a strong baseline law detailing all of the technological capabilities of the drone, as drone technology is extensive and continually changing, a baseline law would give an accurate depiction of current expectations of privacy. This would ensure both governmental and private parties were not using drones in a manner that would violate an individual's privacy. Similarly, a federally enacted baseline law would ensure baseline privacy expectations are consistent between states while also creating a way for private parties to comply more easily with privacy laws. Absent some

¹⁴² See Kasperowicz, *supra* note 128. See also S.B. 200, 98th Gen. Assembly, *supra* note 136.

baseline mechanism for control, drone use may become so commonplace that it dissolves current privacy expectations to the degree that individuals will have no reasonable expectation to privacy. A baseline drone use consumer protection law would be the best and most proactive way to establish strong privacy protection prior to drone implementation and privacy invasions. Following enactment of the baseline law, states could then build on its protections.

A final proposal has been to allow for studies by DOT and FAA, as part of the initiative of the FAA Modernization and Reform Act of 2012, to assess the privacy impact from the integration of drones into national airspace.¹⁴³ While FAA and DOT together have already initiated multiple studies on privacy impacts, resulting in the FAA delaying the naming of several drone-testing sites,¹⁴⁴ studies do not protect against current privacy invasions and cannot replace proactive controls in privacy protection. Furthermore, DOT and FAA are administrative agencies tasked with the protection and safety of vehicles in our national airspace. These agencies are not equipped with the necessary expertise to protect individual rights or individual privacy. While there is a definite benefit in the DOT and FAA assessing drones' impact on privacy during the incorporation of additional drones into national airspace, this benefit should not deter the enactment of additional controls that would more assertively protect individual privacy rights.

V. CONCLUSION

Drone technology is an exciting and quickly evolving technology that has created a modern tool capable of a variety of positive applications. Like many other technologies developed in the twentieth and twenty-first centuries, drones have many positives and many negatives associated with their use. Therefore, proactive steps should be taken by both the Legislature and the Judiciary to ensure individual privacy rights are not eroded with the incorporation of this new technology into our daily lives. The best way to ensure that our reasonable expectation of privacy is maintained is for Congress to enact a baseline consumer protection law that manages both governmental and private party use of drones in national airspace. Following the development of a baseline federal law, states could further protect individual rights by adding state specific legislation to the baseline protection.

¹⁴³ FAA Modernization and Reform Act of 2012, *supra* note 78.

¹⁴⁴ Alan Levin, *FAA Going Slow on Drones as Privacy Concerns Studied*, BLOOMBERG (Nov. 26, 2012, 12:31 PM), <http://go.bloomberg.com/political-capital/2012-11-26/faa-going-slow-on-drones-as-privacy-concerns-studied/>.