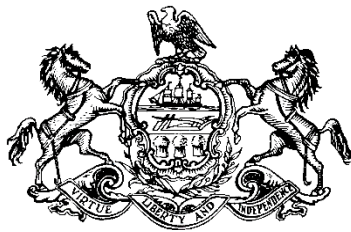


JOINT STATE GOVERNMENT COMMISSION

General Assembly of the Commonwealth of Pennsylvania

UNMANNED AIRCRAFT SYSTEMS IN PENNSYLVANIA

January 2017



*Serving the General Assembly of the
Commonwealth of Pennsylvania Since 1937*

REPORT

Unmanned Aircraft Systems in Pennsylvania

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The full report is also available on our website, <http://jsg.legis.state.pa.us>.

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The Joint State Government Commission was created in 1937 as the primary and central non-partisan, bicameral research and policy development agency for the General Assembly of Pennsylvania.¹

A fourteen-member Executive Committee comprised of the leadership of both the House of Representatives and the Senate oversees the Commission. The seven Executive Committee members from the House of Representatives are the Speaker, the Majority and Minority Leaders, the Majority and Minority Whips, and the Majority and Minority Caucus Chairs. The seven Executive Committee members from the Senate are the President Pro Tempore, the Majority and Minority Leaders, the Majority and Minority Whips, and the Majority and Minority Caucus Chairs. By statute, the Executive Committee selects a chairman of the Commission from among the members of the General Assembly. Historically, the Executive Committee has also selected a Vice-Chair or Treasurer, or both, for the Commission. There was also a Secretary during some years.

The studies conducted by the Commission are authorized by statute or by a simple or joint resolution. In general, the Commission has the power to conduct investigations, study issues, and gather information as directed by the General Assembly. The Commission provides in-depth research on a variety of topics, crafts recommendations to improve public policy and statutory law, and works closely with legislators and their staff.

A Commission study may involve the appointment of a legislative task force, composed of a specified number of legislators from the House of Representatives or the Senate, or both, as set forth in the enabling statute or resolution. In addition to following the progress of a particular study, the principal role of a task force is to determine whether to authorize the publication of any report resulting from the study and the introduction of any proposed legislation contained in the report. However, task force authorization does not necessarily reflect endorsement of all the findings and recommendations contained in a report.

Some studies involve an appointed advisory committee of professionals or interested parties from across the Commonwealth with expertise in a particular topic; others are managed exclusively by Commission staff with the informal involvement of representatives of those entities that can provide insight and information regarding the particular topic. When a study involves an advisory committee, the Commission seeks consensus among the members.² Although an advisory committee member may represent a particular department, agency, association, or group, such representation does not necessarily reflect the endorsement of the department, agency, association, or group of all the findings and recommendations published in a report.

¹ Act of July 1, 1937 (P.L.2460, No.459); (46 P.S. §§ 65 – 69).

² Consensus does not necessarily reflect unanimity among the advisory committee members on each individual policy or legislative recommendation. At a minimum, it reflects the views of a substantial majority of the advisory committee, gained after lengthy review and discussion.

Over the years, nearly one thousand individuals from across the Commonwealth have served as members of the Commission's numerous advisory committees or have assisted the Commission with its studies. Members of advisory committees bring a wide range of knowledge and experience to deliberations involving a particular study. Individuals from countless backgrounds have contributed to the work of the Commission, such as attorneys, judges, professors and other educators, state and local officials, physicians and other health care professionals, business and community leaders, service providers, administrators and other professionals, law enforcement personnel, and concerned citizens. In addition, members of advisory committees donate their time to serve the public good; they are not compensated for their service as members. Consequently, the Commonwealth of Pennsylvania receives the financial benefit of such volunteerism, along with the expertise in developing statutory language and public policy recommendations to improve the law in Pennsylvania.

The Commission periodically reports its findings and recommendations, along with any proposed legislation, to the General Assembly. Certain studies have specific timelines for the publication of a report, as in the case of a discrete or timely topic; other studies, given their complex or considerable nature, are ongoing and involve the publication of periodic reports. Completion of a study, or a particular aspect of an ongoing study, generally results in the publication of a report setting forth background material, policy recommendations, and proposed legislation. However, the release of a report by the Commission does not necessarily reflect the endorsement by the members of the Executive Committee, or the Chair or Vice-Chair of the Commission, of all the findings, recommendations, or conclusions contained in the report. A report containing proposed legislation may also contain official comments, which may be used in determining the intent of the General Assembly.³

Since its inception, the Commission has published more than 350 reports on a sweeping range of topics, including administrative law and procedure; agriculture; athletics and sports; banks and banking; commerce and trade; the commercial code; crimes and offenses; decedents, estates, and fiduciaries; detectives and private police; domestic relations; education; elections; eminent domain; environmental resources; escheats; fish; forests, waters, and state parks; game; health and safety; historical sites and museums; insolvency and assignments; insurance; the judiciary and judicial procedure; labor; law and justice; the legislature; liquor; mechanics' liens; mental health; military affairs; mines and mining; municipalities; prisons and parole; procurement; state-licensed professions and occupations; public utilities; public welfare; real and personal property; state government; taxation and fiscal affairs; transportation; vehicles; and workers' compensation.

Following the completion of a report, subsequent action on the part of the Commission may be required, and, as necessary, the Commission will draft legislation and statutory amendments, update research, track legislation through the legislative process, attend hearings, and answer questions from legislators, legislative staff, interest groups, and constituents.

³ 1 Pa.C.S. § 1939 ("The comments or report of the commission . . . which drafted a statute may be consulted in the construction or application of the original provisions of the statute if such comments or report were published or otherwise generally available prior to the consideration of the statute by the General Assembly").



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January 27, 2017

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To the Members of the General Assembly of Pennsylvania:

The Joint State Government Commission is pleased to announce the release of the report, *Unmanned Aircraft Systems in Pennsylvania*, as directed by Senate Resolution No. 238 of 2015.

The report details the use of unmanned aircraft systems within the Commonwealth, including operations performed by State and local agencies. Additionally, the report enumerates the categories of use and current federal regulations.

The report is also available at <http://jsg.legis.state.pa.us/publications>.

Respectfully submitted,

Glenn J. Pasewicz
 Executive Director

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INTRODUCTION

Senate Resolution No. 238 of 2015 directed the Joint State Government Commission to conduct a study regarding the use of unmanned aircraft systems by State and local agencies, including law enforcement, within the Commonwealth. Pursuant to the resolution, this report includes information regarding:

- the use of unmanned aircraft systems by State and local agencies;
- input from key stakeholders;
- the technological capabilities of unmanned aircraft systems;
- how and where unmanned aircraft systems can be used;
- the current and planned use of unmanned aircraft systems by State and local agencies, including law enforcement, within the Commonwealth; and
- the regulation of unmanned aircraft systems by states outside of the Commonwealth.

Unmanned aircraft, often referred to as drones or unmanned aerial vehicles, are aircraft controlled by an operator on the ground, rather than an onboard human pilot. Specifically, unmanned aircraft are the flying portion of an unmanned aircraft system (UAS). UAS refers to the entire system, which includes all equipment used in the flight, including the control station, communication links and pilot. These systems can take on a wide variety of forms, ranging from toys available in stores to large and sophisticated equipment used by the military. This variation often causes confusion and anxiety due to the range of capabilities. For the purpose of this report, emphasis will be placed on commercial and governmental use of small unmanned aircraft systems as well as clarifying the categories of operations. Military use is not included.

CAPABILITIES

UAS have widespread capabilities that can save lives, save money, and increase productivity. One of the greatest benefits of UAS is their ability to reach areas that are costly or difficult to access otherwise. UAS are being used by farmers, police officers and firefighters, and by small businesses. They are enjoyed by hobbyists who enjoy capturing beautiful scenery or simply enjoy flying. They have the ability to aid in positive governmental operations, in addition to being a catalyst to job creation in the private sector.

As with all technology, the benefits of UAS must be weighed against the costs. Reports have shown UAS being used illegally by private citizens, concerns over “peeping toms”, and abuse of use by police officers. As UAS capabilities and their legal landscape continues to evolve, it is imperative that the Commonwealth weigh the pros and cons of this technology before considering any potential legislation.

Though future capabilities remain to be seen, UAS have been used for a wide variety of applications from environmental monitoring to public safety applications in the United States. The following are further examples of UAS operations that can be conducted under current technology:

- Crop monitoring and inspection
- Research and development
- Educational and academic uses
- Pollution monitoring
- Power-line/pipeline inspection
- Antenna inspections
- Aiding rescue operations
- Bridge inspections
- Aerial photography
- Conservation efforts

UAS are typically equipped with a variety of payloads to assist in their operations. Payloads may include sensors and cameras that provide valuable information to their operators. These cameras are capable of providing instant recorded video and still images. UAS can also be equipped with more sophisticated imaging technology, including infrared thermal imaging systems.

Across the United States, farmers have begun equipping their UAS with crop dust sprayers, which can be cost saving and more ecological than traditional methods,⁴ while companies like Amazon have begun testing UAS to deliver packages to consumers in 30 minutes or less.⁵ UAS have been used by the World Wide Fund for Nature to monitor and protect tigers and rhinoceroses in Nepal⁶ and by the U.S. National Oceanic and Atmospheric Administration to monitor and understand the global environment, including enhancing their ability to predict tropical storms and other weather events.⁷ The current and future capabilities of UAS are endless.

UAS are advancing at a rapid pace. Current technology is quickly becoming outdated and replaced with more sophisticated and capable devices. Due to this swift progression the Commonwealth should remain up-to-date with UAS advancement to both encourage industry growth and protect the citizens it governs.

⁴ Spraying Drone, *A Cost Effective Solution* (Jan. 18, 2016). <http://sprayingdrone.com/index.html>

⁵ Amazon, *Amazon Prime Air* (Jan. 18, 2017). <https://www.amazon.com/Amazon-Prime-Air/b?ie=UTF8&node=8037720011>

⁶ World Wide Fund for Nature, *Unmanned Aerial Vehicle to aid Nepal's Conservation Efforts* (June 18, 2012). <http://wwf.panda.org/?205266/Unmanned-Aerial-Vehicle-to-aid-Nepals-Conservation-Efforts>.

⁷ U.S. National Oceanic and Atmospheric Administration, *NOAA Unmanned Aircraft Systems Program* (Jan. 18, 2017). <https://uas.noaa.gov/>

UAS OPERATIONS

The Federal Aviation Administration (FAA) divides UAS operations into two broad categories, flying for fun (recreation or hobby) and flying for work/business (non-recreational). Each category is discussed briefly below. As the focus of this report, non-recreational UAS operations and their recent authorization will be discussed in detail.

Recreational Use

All hobbyists must register their UAS with the FAA. Once registered, operators must label their UAS with its registration number and ensure that they have read and understood all safety guidelines. General safety guidelines include:

- Fly at or below 400 feet;
- Keep your UAS within sight;
- Never fly near other aircraft, especially near airports;
- Never fly over groups of people;
- Never fly over stadiums or sports events;
- Never fly near emergency response efforts such as fires;
- Never fly under the influence; and
- Be aware of airspace requirements.⁸

Those wishing to operate as a hobbyist have two options to fly within the law and/or FAA regulations. Although these requirements do not necessitate permission from the FAA to fly, operators are obliged to fly safely and abide by the above guidelines.

The first and simplest option requires operators to fly in accordance with the *Special Rule for Model Aircraft*.⁹ Under this rule, there are no pilot requirements; however, operators must:

- Fly for hobby or recreational purposes only;
- Follow a community-based set of safety guidelines;
- Fly the UAS within visual line-of-sight;
- Give way to manned aircraft;

⁸ FAA, *Flying for Fun* (Dec. 14, 2016). https://www.faa.gov/uas/getting_started/fly_for_fun/

⁹ Special Rule for Model Aircraft, Pub. L. No. 112-95, § 336.

- Provide prior notification to the airport and air traffic control tower, if one is present, when flying within 5 miles of an airport;
- Fly UAS that weigh no more than 55 lbs. unless certified by a community-based organization; and
- Register the aircraft.¹⁰

The second option hobbyists have is to fly in accordance with the FAA's Small Unmanned Aircraft Systems Rule (Part 107), which will be discussed in detail within the report. However, if the operator is strictly adhering to the *Special Rule for Model Aircraft*, this option need not apply to those flying for fun. This option requires operators to:

- Obtain a remote pilot certificate or be under the direct supervision of someone who holds such a certificate;
- Register the aircraft as a non-modeler; and
- Follow all operating rules in accordance with the regulation.¹¹

Hobbyist operators are encouraged to download the FAA's safety application, B4UFLY. The app, which is available for free in the App Store for iOS and Google Play store for Android, is easy-to-use and provides real-time information about airspace restrictions and other flying requirements based on the users GPS location. Features include:



- A status indicator informing the operator about the current or planned location. (e.g. operations in the Special Flight Rules Area around Washington, D.C. are prohibited);
- Information regarding the rationale for the status indicator;
- Informative, interactive maps with filtering options; and
- Links to other FAA UAS resources and regulatory information.¹²

According to the FAA, as of May 2016, over 17,000 individual UAS were registered in Pennsylvania. This places Pennsylvania near the top for UAS registrants in the United States. As a whole, there have been nearly 46,000 individual UAS registered with the FAA.¹³

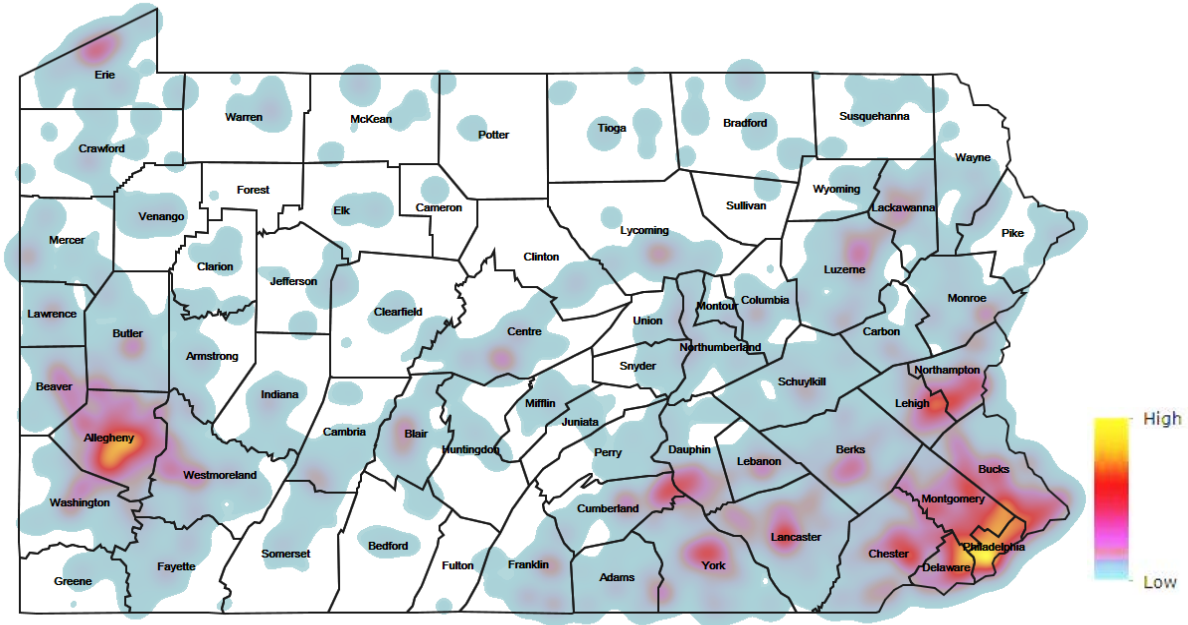
¹⁰ UAS over 0.55 lbs. and less than 55 lbs. can be registered online at registermyuas.faa.gov; UAS 55 lbs. or greater must be registered through the FAA's paper-based process.

¹¹ FAA, *Fly for Fun* (Dec. 14, 2016). https://www.faa.gov/uas/getting_started/fly_for_fun/

¹² FAA, *B4UFLY Smartphone App* (June 14, 2016). https://www.faa.gov/uas/where_to_fly/b4ufly/

¹³ FAA, *FAA Releases Drone Registration Location Data* (July 1, 2016). <https://www.faa.gov/news/updates/?newsId=85548>

Hobbyist Registration Across the Commonwealth



Source: Compiled by JSGC staff from FAA, “Drone Registration Location Data” (July 1, 2016). <https://www.faa.gov/news/updates/?newsId=85548>

Hobbyist UAS Registration Across the United States



Source: Compiled by JSGC staff from FAA, “Drone Registration Location Data” (July 1, 2016). <https://www.faa.gov/news/updates/?newsId=85548>

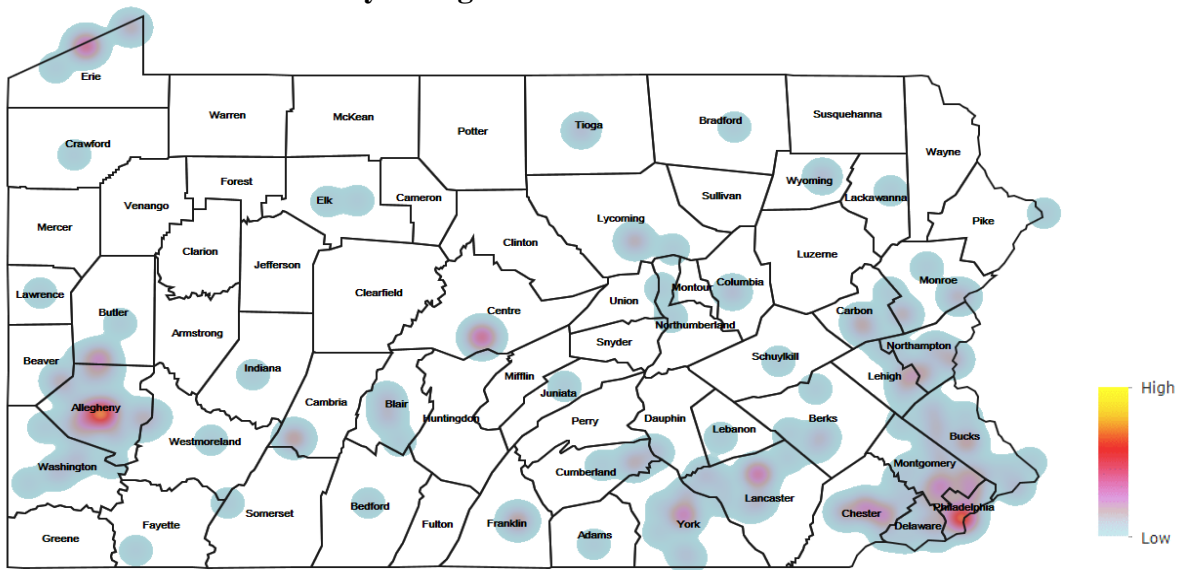
Non-Recreational Use

Operations that are not conducted strictly for hobby or recreational purposes qualify as non-recreational operations. Any UAS flown to receive compensation qualifies as a non-recreational operation. As such, operators are required by law to abide by the Small Unmanned Aircraft Rule (Part 107). Operators who previously received a Section 333 grant of exemption¹⁴ may continue to operate under the exemption until it expires. Operators may also obtain an airworthiness certificate for the aircraft.

Under Part 107, operators flying for business or work are required to register their UAS with the FAA's online registration if it weighs over 0.55 lbs. Aircraft flown under this category must weigh less than 55 lbs. and must also undergo a pre-flight check to ensure UAS is in condition for safe operation. UAS weighing 55 lbs. or more are required to go through the Section 333 exemption process.¹⁵

As of May 2016 there were approximately 250 non-hobbyist individual UAS registered in Pennsylvania. As with hobbyist registration, this places Pennsylvania near the top for UAS registrants for non-hobbyist use in the United States. There are over 8,000 UAS registered for non-hobbyist at last count.¹⁶

Non-Hobbyist Registration Across The Commonwealth



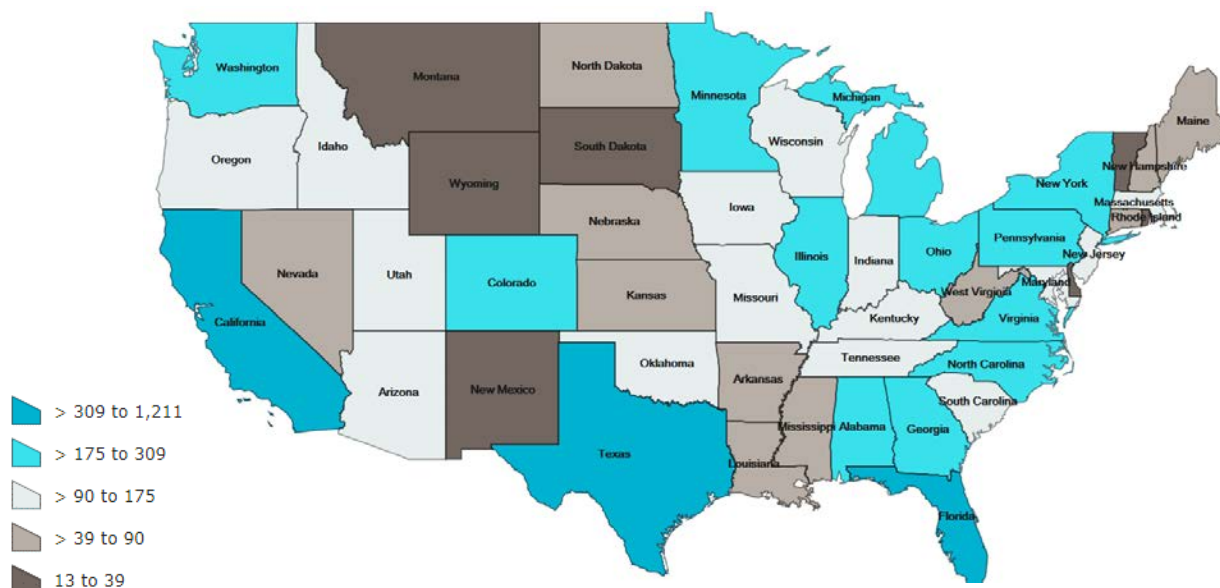
Source: Compiled by JSGC staff from FAA, "Drone Registration Location Data" (July 1, 2016). <https://www.faa.gov/news/updates/?newsId=85548>

¹⁴ Section 333 of Public Law 112-95, Special Rules for Certain Unmanned Aircraft Systems, provided the FAA authority to authorize certain UAS operations. This incremental step provided a pathway for safe and legal civil operations in the NAS and was the primary UAS authorization process until the implementation of Part 107.

¹⁵ FAA, *Fly for Work/Business* (Dec. 14, 2016). https://www.faa.gov/uas/getting_started/fly_for_work_business/

¹⁶ FAA, FAA Releases Drone Registration Location Data (July 1, 2016). <https://www.faa.gov/news/updates/?newsId=85548>

Non-Hobbyist UAS Registration Across the United States



Source: Compiled by JSGC staff from FAA, “Drone Registration Location Data” (July 1, 2016).
<https://www.faa.gov/news/updates/?newsId=85548>

Government Entities

With the creation of Part 107, government entities, such as law enforcement agencies, public universities, state governments, and local municipalities, gained greater flexibility in their ability to operate UAS. However, public operations must abide by the rule.

Alternatively, government entities may obtain a blanket public Certification of Waiver or Authorization (COA). This permits nationwide flights in Class G airspace, which is uncontrolled, at or below 400 feet, self-certification of the UAS pilot, and the option to obtain emergency COAs (e-COAs) under special circumstances.¹⁷

¹⁷ FAA, *Beyond the Basics* (Aug. 29, 2016). https://www.faa.gov/uas/beyond_the_basics/

UAS Registration

All UAS weighing more than 0.55 lbs. must be registered with the FAA. For hobbyists, UAS weighing less than 55 lbs. can be registered through the FAA's small UAS Registration Service,¹⁸ which costs \$5 and is valid for three years. UAS weighing more than 55 lbs. must be submitted via paper request.¹⁹ Operating rules and aircraft requirements are the same as or similar to operations flying under the small UAS rule. Pilot requirements will be evaluated on a case-by-case basis. Operators who do not meet the criteria to register an unmanned aircraft and do not register will be subject to civil and criminal penalties.

¹⁸ FAA, *Small Unmanned Aircraft System (sUAS) Registration Service* (Jan. 18, 2017). <https://registermyuas.faa.gov/>

¹⁹ FAA, *Aircraft Registry* (June 22, 2016).

https://www.faa.gov/licenses_certificates/aircraft_certification/aircraft_registry/UA/

SMALL UNMANNED AIRCRAFT RULE (PART 107)

As popularity of UAS grew, the FAA was tasked with integrating non-recreational small UAS safely into the National Airspace System (NAS). Initiated by Congress through the passage of the FAA Modernization and Reform Act of 2012, the FAA began the long process of integration. This led to the creation of the Small Unmanned Aircraft Rule (Part 107).²⁰

In June of 2016, the FAA released its amended regulations allowing the operation of non-hobby small UAS in the NAS. The rule, which went into effect on August 29, 2016, permits civil operations, as well as public operations that elect to operate as civil. The rule addressed the operation and limitations of UAS, as well as the certification of their remote pilots. The rule also provided safety regulations to prevent model aircraft from endangering the safety of the NAS.

Operational Limitations

The final rule includes numerous operational limitations and restrictions regarding where and how UAS can be operated. The official summary of Part 107 can be found in Appendix I and enumerates all operational limitations. Key operational limitations include:

- UAS must weigh less than 55 lbs., including payloads;
- Aircraft must remain within the visual line-of-sight of the remote pilot in command or the visual observer;
- Operations must take place during daylight or civil twilight only; and
- Operations may not take place over any persons not directly participating in the operations.²¹

Prior to the implementation of Part 107, the FAA did not permit non-hobby UAS operations without specific authorization. This included the Certificate of Waiver or Authorization (COA)

²⁰ 14 C.F.R. pt. 107.

²¹ FAA, *Summary of Small Unmanned Aircraft Rule (Part 107)* (June 21, 2016).
https://www.faa.gov/uas/media/Part_107_Summary.pdf

process, which was often time consuming. This process, however, will still be used for operations that cannot be conducted under Part 107.

Pilot Requirements

Individuals wishing to operate a UAS under Part 107 must either hold a remote airman certificate with a small UAS rating or be under the direct supervision of a person who holds a remote pilot certificate. In order to qualify for a remote pilot certificate a person must:

- Demonstrate aeronautical knowledge by either:
 - Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or
 - Hold a Part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA;
- Be vetted by the Transportation Security Administration; and
- Be at least 16 years old.

Furthermore, the remote pilot in command must:

- Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the rule.
- Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500.
- Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation.
- Ensure that the small unmanned aircraft complies with the existing registration requirements specified in 14 C.F.R. § 91.203(a)(2).²²

Exemptions

As previously mentioned, operators who wish to operate outside of Part 107 may apply for a COA. Waivers are issued by the FAA on a case-by-case basis, which may authorize certain UAS operations not covered under the new rule. Waivable sections of part 107 include:

²² *Ibid.*

- Operation from a moving vehicle or aircraft (§ 107.25);
- Daylight operation (§ 107.29);
- Visual line of sight aircraft operation (§ 107.31)
- Visual observer (§ 107.33);
- Operation of multiple small unmanned aircraft systems (§ 107.35);
- Yielding the right of way (§ 107.37(a));
- Operation over people (§ 107.39);
- Operation in certain airspace (§ 107.41); and
- Operating limitations for small unmanned aircraft (§ 107.51).²³

Classes of Airspace

The FAA divides the NAS into various classes, which includes controlled airspace (A, B, C, D, and E) and uncontrolled airspace (G). The graphic below depicts the different classifications of airspace and defines dimensions that governs flight within the NAS.

Airspace Classification



Source: FAA, *Classes of Airspace* (Dec. 12, 2016)

https://www.faa.gov/gslac/ALC/course_content.aspx?cID=42&sID=505&preview=true.

²³ FAA, *Waivers to Certain Small UAS Operating Rules* (Aug. 29, 2016). https://www.faa.gov/uas/beyond_the_basics/

Operators who want to fly in Class G airspace do not need FAA authorization as long as operations are within Part 107. However, operations in Class B, C, D, and E airspace require air traffic control permission, which can be applied for through the Certificate of Waiver process.²⁴

On August 29, 2016, when the small UAS Rule went into effect, the FAA began issuing Part 107 waivers and airspace authorizations for flights in Class D and Class E. As of October 24, 2016 there have been 81 authorizations for flights in these classes. The FAA began accepting applications for waivers into Class C airspace after October 31, 2016 and for Class B airspace after December 5, 2016.²⁵

Airspace Restrictions

To protect the NAS, the FAA developed the “No Drone Zone” campaign to promote the responsible use of UAS. Common UAS restrictions include stadium and sporting events, wildfires, and airports. For example, operators are required to give notice of flights within five miles of an airport to both the operator and air traffic control tower.

UAS operators should be aware of Temporary Flight Restrictions (TFRs). TFRs define a specific area of airspace where travel is limited due to temporary hazardous conditions or security-related events. TFRs include details of the restriction, including the size, altitude, and time period of the restriction.



NO DRONE ZONE



Furthermore, operators should be aware that the airspace surrounding Washington, D.C. is the most restricted in the U.S. The National Capital Region is governed by a Special Flight Rules Area (SFRA) within a 30-mile radius of Ronald Reagan Washington National Airport, which restricts all flights in the greater metropolitan area.²⁶

²⁴ FAA, *Small Unmanned Aircraft System (sUAS) Waiver and Airspace Authorization Application Instructions* (Aug. 26, 2016). https://www.faa.gov/uas/request_waiver/media/instructions.pdf

²⁵ FAA, *FAA Issues Part 107 Waivers, Airspace Authorization* (Oct. 25, 2016). <https://www.faa.gov/news/updates/?newsId=86707>

²⁶ FAA, *Airspace Restrictions* (Sept. 19, 2016). https://www.faa.gov/uas/where_to_fly/airspace_restrictions/

PRIVACY CONCERNS

UAS have the potential to help law enforcement and other Commonwealth agencies provide better service to the citizens of the Commonwealth. However, many people are suspicious of their use and the potential for abuse of citizens' rights, and in particular, citizens' privacy interests. The Fourth Amendment to the United States Constitution safeguards citizens' privacy interests and prevents excessive government intrusion by providing as follows:

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.²⁷

Courts have interpreted the Fourth Amendment numerous times over the course of two centuries as technology and the understanding of privacy have evolved. In general, the Fourth Amendment applies not to all government actions, but only to those that qualify as a Fourth Amendment "search".

Originally, courts focused on the specific area being investigated. In *Olmstead v. United States*, the Supreme Court held that police wiretaps of Olmstead's telephone did not constitute a "search" because they did not trespass on his property to install the wiretaps.²⁸ Eventually, the Supreme Court shifted its focus from tangible property to an abstract privacy interest. In *Katz v. United States*, the Supreme Court held that an FBI agent's use of a device to listen to a private telephone conversation Katz had in a telephone booth violated his Fourth Amendment rights because, although he was in a public telephone booth and there was no physical invasion, Katz had a reasonable expectation of privacy.²⁹ The Supreme Court noted in *United States v. Jones* that the reasonable expectation of privacy test augmented, but did not replace, the property-based test.³⁰

While the home receives the most Fourth Amendment protection, it is not absolutely protected from government searches. In *Katz*, Justice Harlan emphasized in his concurrence that "a man's home is, for most purposes, a place where he expects privacy, but 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."³¹ Therefore, police may use their natural senses to

²⁷ U.S. CONST. amend IV.

²⁸ *Olmstead v. United States*, 277 U.S. 438, 466 (1928).

²⁹ *Katz v. United States*, 389 U.S. 347, 351, 361 (1967); *see also* *Oliver v. United States*, 466 U.S. 170 (1984).

³⁰ *United States v. Jones*, 132 S. Ct. 945, 950 n.3 (2012).

³¹ *Katz v. United States*, 389 U.S. 347, 361 (1967).

conduct “searches” of a home under what is known as the “plain view” doctrine, but the police must be in a lawful vantage point when they conduct the “search”.³²

In *Kyllo v. United States*, the Supreme Court held that the use of thermal imaging to determine heat patterns inside Kyllo’s home constituted a “search” because government agents obtained information about the inside of the home that could not otherwise be obtained except by entering the home through the use of technology not in “general public use”.³³ Furthermore, in *Florida v. Jardines*, the Supreme Court held that using a trained dog on the front porch of a home to detect the presence of drugs was a violation of the Fourth Amendment.³⁴

Areas outside of the home, yet on a citizen’s private property, may be considered “curtilage” or “open fields”.³⁵ Curtilage is the area immediately surrounding the home, which the Supreme Court has granted similar protections as the inside of the home.³⁶ To determine if an area is curtilage, the court will look at several factors, including: how close the area is to the home; whether the area is within a fence surrounding the home; how the area is used; and whether the area is protected from observation by passersby.³⁷ The area outside the curtilage is sometimes considered “open fields”, which is not granted Fourth Amendment protections similar to the inside of the home.³⁸

Notable cases involving manned aerial surveillance have relied on the concepts of curtilage and open fields. In *California v. Ciralolo*, the Supreme Court held that the police did not violate the Fourth Amendment when they flew a fixed-wing aircraft at a low altitude (1,000 feet) over Ciralolo’s backyard and spotted marijuana plants with their naked eyes because Ciralolo had no reasonable expectation of privacy in his backyard being viewed from FAA-regulated airspace, just as there is no reasonable expectation of privacy in a backyard viewable from a public street.³⁹

In *Florida v. Riley*, the Supreme Court held that police did not violate the Fourth Amendment when they flew a helicopter at 400 feet and observed marijuana plants inside a greenhouse located 10 to 20 feet away from Riley’s mobile home through openings in the roof because the helicopter was in FAA-regulated airspace and any member of the public could have viewed the plants.⁴⁰

³² See *United States v. Hammett*, 236 F.3d 1054, 1061 (9th Cir. 2001), where police observation of marijuana plants through a crack in the house’s siding did not constitute an unlawful search; *United States v. Taylor*, 90 F.3d 903, 909 (4th Cir. 1996), where the court held that the police officer’s observation of contraband through the front dining room window was not unlawful; and *Coolidge v. New Hampshire*, 403 U.S. 443, 466 (1971).

³³ *Kyllo v. United States*, 533 U.S. 27, 29-31, 34 (2001).

³⁴ *Florida v. Jardines*, 133 S.Ct. 1409 (2013).

³⁵ See *United States v. Hester*, 365 U.S. 57 (1924).

³⁶ Curtilage is “the area to which extends the intimate activity associated with the ‘sanctity of a man’s home and the privacies of life.’” *Oliver v. United States*, 466 U.S. 170, 180 (1984), quoting *Boyd v. United States*, 116 U.S. 616, 630 (1886).

³⁷ *United States v. Dunn*, 480 U.S. 294, 301 (1987).

³⁸ *Dow Chemical Co. v. United States*, 476 U.S. 227, 234-35 (1986).

³⁹ *California v. Ciralolo*, 476 U.S. 207 (1986).

⁴⁰ *Florida v. Riley* 488 U.S. 445 (1989).

In *Dow Chemical v. United States*, the Supreme Court similarly held that the EPA did not violate the Fourth Amendment when it contracted with an aerial photographer to fly at 1,200, 3,000, and 12,000 feet and provide images of the Dow Chemical facility because the 200 acres of open area around the facility were more like an open field than like the curtilage of a home.⁴¹ Furthermore, the altitudes were within FAA-regulated airspace and although the EPA used photographs rather than naked eye observation, the technology was publicly and commonly available.

The Supreme Court has not yet decided any cases involving UAS, and it is not clear how it may apply Fourth Amendment jurisprudence. While the aerial surveillance cases seem most on point, UAS differ from manned aerial surveillance in several ways. Specifically, UAS are required to operate well below public, navigable airspace, one common factor in all existing case law. Furthermore, while thermal imaging and drug-sniffing dogs remain relatively specialized and unavailable to the general public, UAS are available in a wide range of sizes, capabilities, and prices to everyone from children to police and military organizations.

FAA's Privacy Policy

The FAA remains a partner in efforts to protect the privacy interests of public. As part of their privacy education campaign, the FAA provides UAS operators with recommended privacy guidelines and safety protocols through the registration process and the B4UFLY mobile app. All commercial UAS pilots will be educated on privacy concerns during their pilot certification process. Further, operators are advised to check local and state laws before gathering information through remote sensing technology or photography.⁴²

These efforts build on existing guidelines, including “Voluntary Best Practices for UAS Privacy, Transparency, and Accountability,” which the National Telecommunications and Information Administration published in 2016 as the result of a year-long outreach initiative with privacy advocates and industry. This document outlines and describes voluntary best practices that UAS operators could take to advance UAS privacy, transparency, and accountability for the private and commercial use of UAS. See Appendix II for guidelines.

Although the FAA provides operational guidelines, privacy issues surrounding UAS use and regulations of how UAS can gather data on people or property lie outside of the FAA's core mission. Therefore, the FAA did not specifically address privacy issues in the Small UAS Rule. They do, however, encourage states to engage with policy makers, industry, advocacy groups, and members of the public to determine how to address privacy concerns.⁴³

⁴¹ *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986).

⁴² U.S. Department of Transportation: Federal Aviation Administration, *Advisory Circular re: Small Unmanned Aircraft Systems* (June 21, 2016) https://www.faa.gov/uas/media/AC_107-2_AFS-1_Signed.pdf

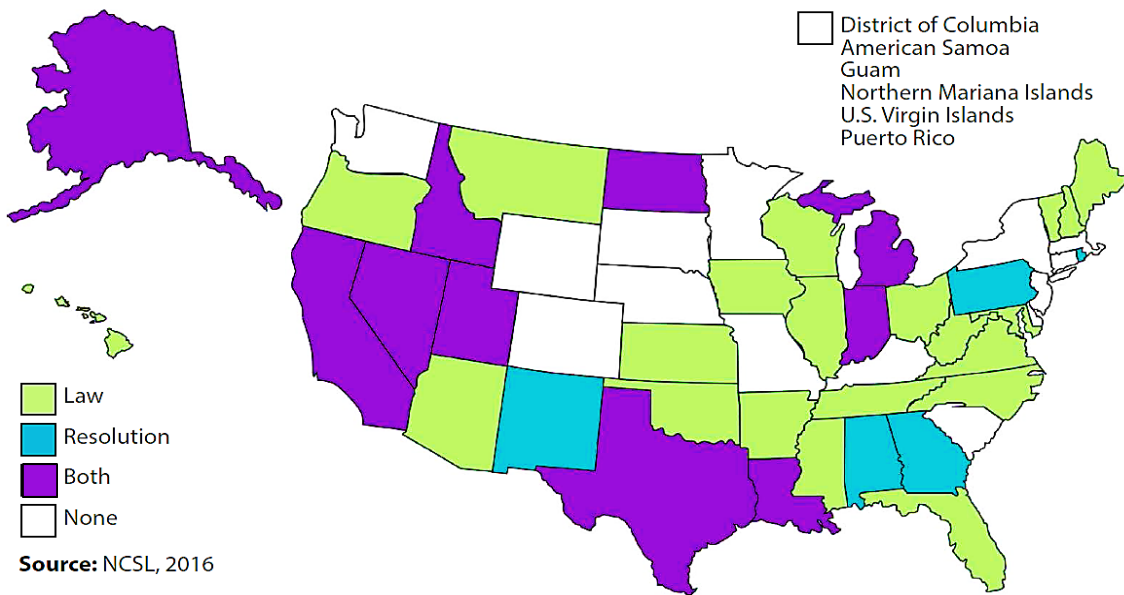
⁴³ FAA, *Press Release-DOT and FAA Finalize Rules for Small Unmanned Aircraft Systems* (June 21, 2016) https://www.faa.gov/news/press_releases/news_story.cfm?newsId=20515

NATIONWIDE RESPONSES

The uncertainty surrounding UAS has raised concerns for legislatures around the country, specifically regarding the future of Fourth Amendment privacy interests. In response, 43 states considered UAS-related legislation in 2013,⁴⁴ 35 states considered UAS-related legislation in 2014,⁴⁵ 45 states considered UAS-related legislation in 2015, and at least 38 states considered UAS-related legislation in 2016.⁴⁶ For 2016, 18 of those states enacted 32 pieces of legislation, while other states adopted resolutions. In total, 32 states have enacted laws specific to UAS and five have adopted resolutions. The governors of Georgia and North Dakota issued executive orders related to UAS.⁴⁷

Moreover, some states have implemented laws to prohibit localities from regulating UAS.⁴⁸ This prohibition aims to prevent a regulatory patchwork that could be confusing for operators and make it difficult for industries to advance their use of UAS.

UAS LAWS AND RESOLUTIONS



⁴⁴ Nat'l Conf. of State Legislatures, *2013 State Unmanned Aircraft Systems (UAS) Legislation* (July 2, 2015) <http://www.ncsl.org/research/transportation/2013-state-unmanned-aircraft-systems-uas-legislation.aspx>.

⁴⁵ Nat'l Conf. of State Legislatures, *2014 State Unmanned Aircraft Systems (UAS) Legislation* (July 2, 2015) <http://www.ncsl.org/research/transportation/2014-state-unmanned-aircraft-systems-uas-legislation.aspx>.

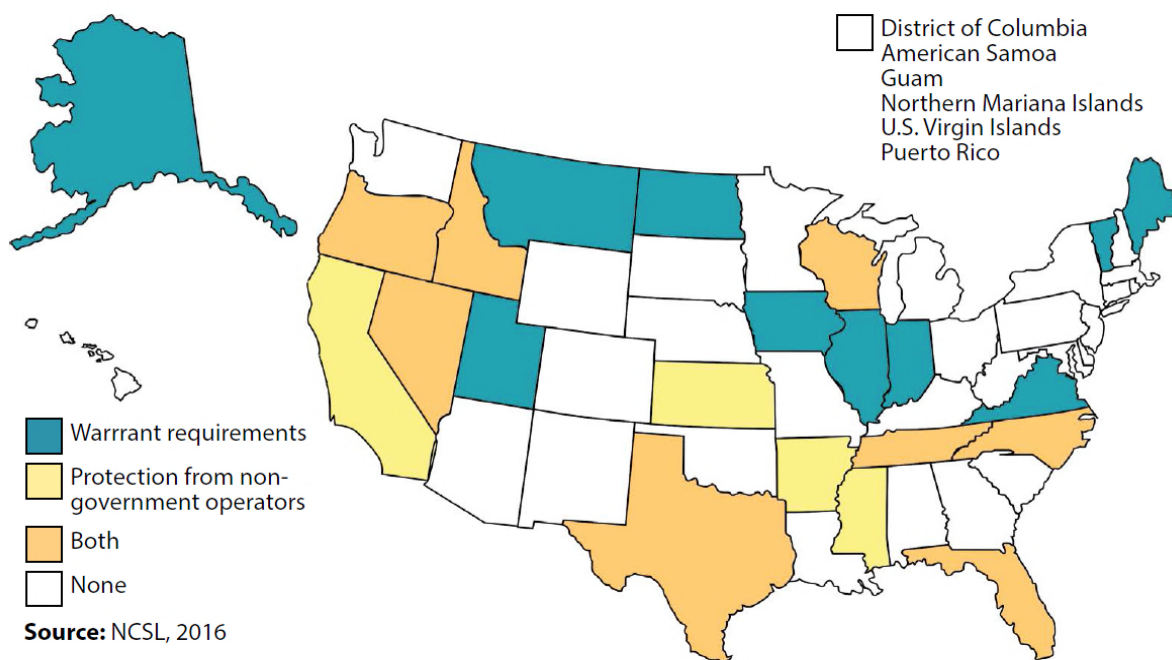
⁴⁶ Nat'l Conf. of State Legislatures, *Current Unmanned Aircraft State Law Landscape* (Aug. 16, 2016) <http://www.ncsl.org/research/transportation/current-unmanned-aircraft-state-law-landscape.aspx>.

⁴⁷ *Ibid.*

⁴⁸ See OR. REV. STAT. § 837.385; MD. CODE, ECON. DEV. § 14-301; VA. CODE § 15.2-926.3; ARIZ. REV. STAT. § 13-3729.

At least 18 states have enacted legislation specifically aimed at addressing privacy concerns, including requiring law enforcement agencies to obtain search warrants prior to the use of UAS for surveillance or search purposes.⁴⁹ For example, Vermont’s governor signed Senate Bill 155 into law in June of 2016, which regulates the use of UAS by law enforcement and requires them to annually report on the use of UAS by the department.⁵⁰ It also prohibits the weaponization of UAS.⁵¹ Louisiana’s governor signed Senate Bill 73, effective August 8, 2016, which adds intentionally crossing a police cordon using a UAS to the crime of obstructing an officer.⁵² It also allows law enforcement or fire department personnel to disable the UAS if it endangers the public or an officer's safety.⁵³ The following map shows current UAS-related privacy protections.

UAS PRIVACY PROTECTIONS



The effects of these efforts to prospectively address privacy concerns are uncertain in this new and evolving intersection of technology and law.

⁴⁹ Amanda Essex, “Taking Off: State Unmanned Aircraft Systems Policies,” Nat’l Conf. of State Legislatures, June 2016, http://www.ncsl.org/Portals/1/Documents/transportation/TAKING_OFF-STATE_%20UNMANNED_%20AIRCRAFT_SYSTEMS_%20POLICIES_%20%28004%29.pdf, p. 14.

⁵⁰ 20 V.S.A. §§ 4621-4624.

⁵¹ 13 V.S.A. § 4018.

⁵² R.S. 14:108(B)(1)(e).

⁵³ *Ibid.*

PENNSYLVANIA UAS

The rapid growth of UAS and their numerous capabilities have attracted interest across Pennsylvania. Although many Commonwealth agencies have considered utilizing the technology, most have not begun operations. Local government agencies, however, seem to be more eager to adopt the new technology.

State Government Agencies

Few State agencies have confirmed ownership and/or operation of UAS within the Commonwealth. At this time, the Pennsylvania Game Commission (PGC) is the sole State agency with confirmed ongoing operations. PGC owns and operates two UAS: the Phantom 1, which is typically used for training purposes, and the Phantom 2, their primary UAS. The Phantom 2 has a remote controller and has an attached Go Pro Hero 4 camera unit.

PGC's primary use is for video productions and still photos for educating the public about game lands, habitat, and wildlife. Currently, the PGC has one employee who is registered with the FAA to operate UAS. The operator has been using the UAS for low level habitat video on their 1.5 million acres, flying only on PGC property. PGC has confirmed that they follow all guidelines set forth by FAA and do not typically fly higher than 200 ft. in elevation and never fly around people.⁵⁴

In addition, the Pennsylvania Department of Transportation (PennDOT) is in ownership of a Dragon Flyer X-4 (pictured below) which uses Pix4D software to produce images. However, PennDOT is not currently operating it at this time.⁵⁵ Prior to grounding operations, PennDOT used their UAS to evaluate rockslides and sinkholes.⁵⁶

Dragon Flyer X-4



⁵⁴ E-mail from Joshua Zimmerman, Legislative Liaison, Pennsylvania Game Commission, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (March 28, 2016).

⁵⁵ E-mail from John G. Melville, Aviation Safety and Licensing Supervisor, Pennsylvania Bureau of Aviation, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Oct. 24, 2016).

⁵⁶ Anthony J. McCloskey, Director, Bureau of Aviation, Senate Majority Policy Committee Hearing on the Use of Unmanned Aerial Vehicles (March 15, 2016). <http://policy.pasenategop.com/030916/>

Many more State agencies are considering and/or taking steps to utilize UAS technology within their fields of work. According to an anonymous survey conducted by PennDOT's Bureau of Aviation, there are at least six State agencies reporting they anticipate future UAS use.⁵⁷ At this time, there are two known agencies who have confirmed they plan to operate UAS in the future: the Fish and Boat Commission, which is considering use for boating accident searches⁵⁸, and the Pennsylvania Department of Corrections, which is putting together a proposal to have UAS available in each region for critical incidents, facility mapping, damage assessments, vulnerability analyses, aerial photography, and to assist other agencies (e.g. searches for missing persons).⁵⁹

The survey conducted by PennDOT's Bureau of Aviation received the following responses for potential UAS operations:⁶⁰

- Aerial mapping (4 responses);
- Recording and/or documenting events (4 responses);
- Augment internal operations (3 responses);
- Document project work and completion (3 responses);
- Educational purposes (3 responses);
- Law enforcement related activities (1 response); and
- Assisting other agencies (missing person searches, police manhunts, etc.) (1 response).

The Pennsylvania State Police responded that they do not operate, nor do they have plans to operate at this time; however, they “remain very interested in the subject and have been closely monitoring legislation that has been introduced relating to the use of UAS.”⁶¹ Additionally, neither the Pennsylvania Department of Education nor the Pennsylvania School Boards Association have a policy on this topic. Instead, the Pennsylvania Department of Education foresees this issue being addressed by the districts themselves.⁶²

⁵⁷ E-mail from John G. Melville, Aviation Safety and Licensing Supervisor, Pennsylvania Bureau of Aviation, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Dec. 9, 2016).

⁵⁸ E-mail from Tim Schaeffer, Director of the Bureau of Policy, Planning and Communications, Pennsylvania Fish & Boat Commission, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Feb 26, 2016).

⁵⁹ E-mail from Diana Woodside, Director of Policy & Legislative Affairs, Pennsylvania Department of Corrections, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Jan. 10, 2017).

⁶⁰ E-mail from John G. Melville, Aviation Safety and Licensing Supervisor, Pennsylvania Bureau of Aviation, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Dec. 9, 2016).

⁶¹ E-mail from Captain Sean T. McGinley, Dir., Legislative Affairs & Policy Office, Pennsylvania State Police, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Sept. 27, 2016).

⁶² E-mail from Angela P. Fritterer, Director of Government Relations, Pennsylvania Department of Education, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (July. 7, 2016).

While the majority of State agencies have not begun operations, some have adopted policies regarding their use. For example, the Pennsylvania Department of Conservation and Natural Resources allows UAS operations at certain locations within the following six State Parks: Beltzville, Benjamin Rush, Hillman, Lackawanna, Prompton, and Tuscarora. Those planning to operate must contact the office of the park they plan to operate in ensure compliance with all rules and regulations. The operation of UAS is restricted at all other State Park locations.⁶³

Local Government Agencies

Local government entities have also been employing UAS to enhance their work. For example, the Bradford County Conservation District has been utilizing UAS technology for two years. Their UAS, which is a DJI Phantom 2 Vision +, is used primarily to gain an aerial perspective on the various projects they work on, as well as for educational purposes for students.⁶⁴

Typically, operators fly over a stream project before any best management practices are installed and then again afterward to see the difference. In addition, we use UAS during high water events to make sure things are working properly and if they aren't we are able to see and document that. We also use it on farms to get documentation of the land before and after best management practices are installed. We always provide a copy of the footage to the farmer because in a lot of instances, they haven't seen their own farm from the air. It's a good way to see conservation in action. We have also taken it to educational youth field days at our neighboring districts to teach kids how the drone works and what it is used for in our line of work.⁶⁵

The success of the Bradford County Conservation District has sparked interest from other Conservation Districts in the Commonwealth. Many are now considering the investment into UAS to enhance their conservation efforts.

Conservation is just one of the many areas that are benefiting from UAS technology across the Commonwealth. Several county coroners have been employing UAS to enhance their work. The Cumberland County Coroner operates a DJI Phantom Professional Drone equipped to take video and still photos. These operations are typically used as an aerial photography platform at fatal auto accidents.⁶⁶

⁶³ Pennsylvania Department of Conservation and Natural Resources, *Unmanned Aerial Systems (UAS) and Drone Use* (Nov. 15, 2016) <http://www.dcnr.state.pa.us/stateparks/rulesandregulations/dronesanduas/index.htm>.

⁶⁴ E-mail from Cathy Yeakel, District Manager, Bradford County Conservation District, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Jan. 11, 2017).

⁶⁵ *Ibid.*

⁶⁶ E-mail from Charles Hall, Cumberland County Coroner, to Kathleen Wojtowicz, Public Policy Analyst, Joint State Government Commission (Jan. 11, 2017).

Additionally, there have been reports of local law enforcement agencies and district attorneys' offices operating UAS. In 2015, the Mount Carmel Township Police Department was the first police department in Pennsylvania to be certified by the FAA to operate a UAS program. Their UAS is equipped with infrared cameras. This technology allows the Department to respond to emergency situations, such as searching for a missing person or pinpointing forest fire locations.

At a Senate Majority Policy Committee Hearing on March 15, 2016, the Cumberland County District Attorney shared information regarding their use of UAS. Their ability to operate UAS has been "extremely helpful" for crime investigations, using it to photograph and map crime scenes. They also alluded to their ability to deter crime.⁶⁷

In large part, the Commonwealth and its various State and local agencies have not caught up with the rapid growth of the UAS industry. It is imperative the General Assembly considers all factors and stakeholders when considering any legislative action. This should include economic impact, safety, privacy, and existing legal framework.

⁶⁷ David Freed, Cumberland County District Attorney, Senate Majority Policy Committee Hearing on the Use of Unmanned Aerial Vehicles, March 15, 2016. <http://policy.pasenategop.com/030916/>

RECOMMENDATIONS

With the publication of the new Small UAS Rule (Part 107), Commonwealth agencies are increasingly interested in utilizing UAS. However, without a common set of guidelines for the use of this new technology, State agencies are at risk of FAA violations and the consequences associated with UAS operators who deviate from FAA regulations or operate in a way that alarms the general public.

A central Commonwealth agency to establish common operating standards for State agencies is the next logical step to assure the safe and effective use of UAS. PennDOT's Bureau of Aviation's mission is to provide expertise and assistance in the development, promotion, and preservation of aviation, in partnership with government, business and community, to provide a safe and reliable air system. Ensuing, the Bureau of Aviation is the natural leader for UAS within the Commonwealth.

Bureau personnel have the aeronautical knowledge and networking relationships with both the FAA and the aeronautical community to manage these operational requirements. By providing common operational standards, state operator training and certification, FAA coordination, operator accreditation, UAS support to Commonwealth agencies, and facilitating public outreach efforts, an oversight center will ensure safety as the Commonwealth adapts to the new and advanced technology.

Therefore, the Commonwealth should establish a UAS Management Center, as a subsection within the Bureau of Aviation, to provide a central coordinating office for all State agencies. The UAS Management Center would establish and oversee standards for all agencies conducting UAS operations and work to enhance UAS safety within the Commonwealth. The UAS Management Center should:

- Develop standard operating guidelines for State UAS operators and State contractors;
- Require formal certification of all State UAS operators by the UAS Management Center;
- Require completion of a UAS training program for State operators (facilitated by the State UAS Management Center); and
- Offer UAS Management Center support to local municipalities for UAS operator training and certification.

Additionally, the Bureau of Aviation has provided the following recommendations regarding the use of UAS within the Commonwealth. The General Assembly should enact legislation to:

- Prohibit municipalities from regulating UAS activities within their boundaries;
- Prohibit the use of UAS in State and municipal parks without permission;
- Prohibit the use of UAS for hunting and fishing; and
- Prohibit the use of UAS for photography or surveillance of an individual without permission (law enforcement agencies excluded).

Summary of Small Unmanned Aircraft Rule
(PART 107)

FAA News



Federal Aviation Administration, Washington, DC 20591

June 21, 2016

SUMMARY OF SMALL UNMANNED AIRCRAFT RULE (PART 107)

<p>Operational Limitations</p>	<ul style="list-style-type: none">• Unmanned aircraft must weigh less than 55 lbs. (25 kg).• Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer.• At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.• Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.• Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting.• Must yield right of way to other aircraft.• May use visual observer (VO) but not required.• First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways.• Maximum groundspeed of 100 mph (87 knots).• Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure.• Minimum weather visibility of 3 miles from control station.• Operations in Class B, C, D and E airspace are allowed with the required ATC permission.• Operations in Class G airspace are allowed without ATC permission.• No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time.• No operations from a moving aircraft.• No operations from a moving vehicle unless the operation is over a sparsely populated area.• No careless or reckless operations.• No carriage of hazardous materials.
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Summary of Small Unmanned Aircraft Rule (PART 107)
(pg. 2 of 3)

	<ul style="list-style-type: none"> • Requires preflight inspection by the remote pilot in command. • A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS. • Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375. • External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft. • Transportation of property for compensation or hire allowed provided that- <ul style="list-style-type: none"> ○ The aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total; ○ The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and ○ The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession. • Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.
<p>Remote Pilot in Command Certification and Responsibilities</p>	<ul style="list-style-type: none"> • Establishes a remote pilot in command position. • A person operating a small UAS must either hold a remote pilot airman certificate with a small UAS rating or be under the direct supervision of a person who does hold a remote pilot certificate (remote pilot in command). • To qualify for a remote pilot certificate, a person must: <ul style="list-style-type: none"> ○ Demonstrate aeronautical knowledge by either: <ul style="list-style-type: none"> ▪ Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or ▪ Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA. ○ Be vetted by the Transportation Security Administration. ○ Be at least 16 years old. • Part 61 pilot certificate holders may obtain a temporary remote pilot certificate immediately upon submission of their application for a permanent certificate. Other applicants will obtain a temporary remote pilot certificate upon successful completion of TSA security vetting. The FAA anticipates that it will be able to issue a temporary remote pilot certificate within 10 business days after receiving a completed remote pilot certificate application. • Until international standards are developed, foreign-

Summary of Small Unmanned Aircraft Rule (PART 107)
(pg. 3 of 3)

	<p>certificated UAS pilots will be required to obtain an FAA-issued remote pilot certificate with a small UAS rating.</p> <p>A remote pilot in command must:</p> <ul style="list-style-type: none"> • Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the rule. • Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least \$500. • Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation. • Ensure that the small unmanned aircraft complies with the existing registration requirements specified in § 91.203(a)(2). <p>A remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency.</p>
<p>Aircraft Requirements</p>	<ul style="list-style-type: none"> • FAA airworthiness certification is not required. However, the remote pilot in command must conduct a preflight check of the small UAS to ensure that it is in a condition for safe operation.
<p>Model Aircraft</p>	<ul style="list-style-type: none"> • Part 107 does not apply to model aircraft that satisfy all of the criteria specified in section 336 of Public Law 112-95. • The rule codifies the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS.

National Telecommunications and Information Administration

*Voluntary Best Practices for
UAS Privacy, Transparency, and Accountability*

I. INTRODUCTION

The benefits of commercial and private unmanned aircraft systems (UAS) are substantial. Technology has moved forward rapidly, and what used to be considered toys are quickly becoming powerful commercial tools that can provide enormous benefits in terms of safety and efficiency. UAS integration will have a significant positive economic impact in the United States. Whether UAS are performing search and rescue missions, allowing farmers to be more efficient and environmentally friendly, inspecting power lines and cell towers, gathering news and enhancing the public's access to information, performing aerial photography to sell real estate and provide insurance services, surveying and mapping areas for public policy, delivering medicine to rural locations, providing wireless internet, enhancing construction site safety, or more—society is only just beginning to realize the full potential of UAS. UAS technology is already bringing substantial benefits to people's daily lives, including cheaper goods, innovative services, safer infrastructure, recreational uses, and greater economic activity. Inevitably, creative minds will devise many more UAS uses that will save lives, save money and make our society more productive.

However, the very characteristics that make UAS so promising for commercial and non-commercial uses, including their small size, maneuverability and capacity to carry various kinds of recording or sensory devices, can raise privacy concerns. As a result, individuals may be apprehensive about the adoption of this technology into everyday life. In order to ensure that UAS and the exciting possibilities that come with them live up to their full potential, operators should use this technology in a responsible, ethical, and respectful way. This should include a commitment to transparency, privacy and accountability.

The purpose of this document is to outline and describe voluntary Best Practices that UAS operators could take to advance UAS privacy, transparency and accountability for the private and commercial use of UAS.¹ UAS operators may implement these Best Practices in a variety of ways, depending on their circumstances and technology uses, and evolving privacy expectations. In some cases, these Best Practices are meant to go beyond existing law and they do not—and are not meant to—create a legal standard of care by which the activities of any particular UAS operator should be judged. These

¹ The National Telecommunications and Information Administration (NTIA) has convened a series of multi-stakeholder efforts as a way to increase privacy protections based upon the Administration's framework for consumer information privacy. On February 15, 2015, President Obama issued a Presidential Memorandum instructing NTIA to convene such a process to develop and communicate best practices for privacy, accountability, and transparency issues regarding commercial and private UAS use in the National Airspace System. These Voluntary Best Practices are the result of that multi-stakeholder engagement process.

Best Practices are also not intended to serve as a template for future statutory or regulatory obligations, in part because doing so would make these standards mandatory (not voluntary) and could therefore raise First Amendment concerns.

II. APPLICABILITY

These voluntary Best Practices for UAS focus on data collected via a UAS, which includes both commercial and non-commercial UAS. The only section applicable to newsgatherers and news reporting organizations is Section V considering that their activity is strongly protected by the First Amendment to the Constitution of the United States. There is also an Appendix entitled, “Guidelines for Neighborly Drone Use” that is intended to be a quick and easy reference guide for recreational UAS operators.

These Best Practices do not apply to data collected by other means—for instance, a company need not apply these Best Practices to data collected via the company’s website. These Best Practices do not apply to the use of UAS for purposes of emergency response, including safety and rescue responses.

Nothing in these Best Practices shall:

- Be construed to limit or diminish freedoms guaranteed under the Constitution;
- Replace or take precedence over any local, state, or federal law or regulation;
- Take precedence over contractual obligations or the representations of entities contracting UAS operators. However, entities contracting UAS operators should consider these Best Practices when setting the terms of a contract for UAS use, and UAS operators should consider these Best Practices when choosing to accept a contract for UAS use; or
- Impede the safe operation of a UAS.

UAS operators should comply with all applicable laws and regulations. These Best Practices are intended to encourage positive conduct that complements legal compliance. Operators who are aware of other best practices that may apply specific guidance to technologies deployed on or through UAS should consider how to incorporate that guidance into their privacy and security policies and practices.

These Best Practices are also not intended to serve as a template for future statutory or regulatory obligations, in part because doing so would raise First Amendment issues.

III. DEFINITIONS

The term “*consent*” means words or conduct indicating permission. Consent must be informed and conduct indicating permission may be express or implied, depending on the context.

“*Covered data*” means information collected by a UAS that identifies a particular person. If data collected by UAS likely will not be linked to an individual’s name or other personally identifiable information, or if the data is altered so that a specific person is not recognizable, it is not covered data.

The term “*data subjects*” refers to the individuals about whom covered data is collected.

The terms “*where practicable*” and “*reasonable*” depend largely on the circumstances of the UAS operator, the sensitivity of data collected, and the context associated with a particular UAS operation.

IV. VOLUNTARY BEST PRACTICES

1. INFORM OTHERS OF YOUR USE OF UAS

1(a) Where practicable, UAS operators should make a reasonable effort to provide prior notice to individuals of the general timeframe and area that they may anticipate a UAS intentionally collecting covered data.²

1(b) When a UAS operator anticipates that UAS use may result in collection of covered data, the operator should provide a privacy policy for such data appropriate to the size and complexity of the operator, or incorporate such a policy into an existing privacy policy. The privacy policy should be in place no later than the time of collection and made publicly available. The policy should include, as practicable:

- (1) the purposes for which UAS will collect covered data;³

² What qualifies as a practicable and reasonable effort to provide prior notice will depend on operators’ circumstances and the context of the UAS operation. For example, delivery UAS operators may provide customers with an estimated time of delivery. Real estate professionals using UAS may provide a home seller (and possibly immediate neighbors) with prior notice of the estimated date of UAS photography of the property. Hobbyist UAS operators may not need to notify nearby individuals of UAS flight in the vicinity.

- (2) the kinds of covered data UAS will collect;
- (3) information regarding any data retention and de-identification practices;⁴
- (4) examples of the types of any entities with whom covered data will be shared;
- (5) information on how to submit privacy and security complaints or concerns;
- and
- (6) information describing practices in responding to law enforcement requests.

Material changes to the above should be incorporated into the privacy policy.

2. SHOW CARE WHEN OPERATING UAS OR COLLECTING AND STORING COVERED DATA

2(a) In the absence of a compelling need to do otherwise, or consent of the data subjects, UAS operators should avoid using UAS for the specific purpose of intentionally collecting covered data where the operator knows the data subject has a reasonable expectation of privacy.

2(b) In the absence of a compelling need to do otherwise, or consent of the data subjects, UAS operators should avoid using UAS for the specific purpose of persistent and continuous collection of covered data about individuals.

2(c) Where it will not impede the purpose for which the UAS is used or conflict with FAA guidelines, UAS operators should make a reasonable effort to minimize UAS operations over or within private property without consent of the property owner or without appropriate legal authority.

2(d) UAS operators should make a reasonable effort to avoid knowingly retaining covered data longer than reasonably necessary to fulfill a purpose as outlined in § IV.1(b). With the consent of the data subject, or in exceptional circumstances (such as legal disputes or safety incidents), such data may be held for a longer period.

2(e) UAS operators should establish a process, appropriate to the size and complexity of the operator, for receiving privacy or security concerns, including requests to delete,

³ These Best Practices recognize that UAS operators may not be able to predict all future uses of data. Accordingly, these Best Practices do not intend to discourage unplanned or innovative data uses that may result in desirable economic or societal benefits.

⁴ If it is not practicable to provide an exact retention period, because, for example, the retention period depends on legal hold requirements or evolving business operations, the UAS operator may explain that to data subjects when disclosing its retention policies.

de-identify, or obfuscate the data subject's covered data. Commercial operators should make this process easily accessible to the public, such as by placing points of contact on a company website.⁵

3. LIMIT THE USE AND SHARING OF COVERED DATA

3(a) UAS operators should not use covered data for the following purposes without consent: employment eligibility, promotion, or retention; credit eligibility; or health care treatment eligibility other than when expressly permitted by and subject to the requirements of a sector-specific regulatory framework.

3(b) UAS operators should make a reasonable effort to avoid using or sharing covered data for any purpose that is not included in the privacy policy covering UAS data.

3(c) If publicly disclosing covered data is not necessary to fulfill the purpose for which the UAS is used, UAS operators should avoid knowingly publicly disclosing data collected via UAS until the operator has undertaken a reasonable effort to obfuscate or de-identify covered data —unless the data subjects provide consent to the disclosure.

3(d) UAS operators should make a reasonable effort to avoid using or sharing covered data for marketing purposes unless the data subject provides consent to the use or disclosure. There is no restriction on the use or sharing of aggregated covered data as an input (*e.g.*, statistical information) for broader marketing campaigns.

4. SECURE COVERED DATA

4(a) UAS operators should take measures to manage security risks of covered data by implementing a program that contains reasonable administrative, technical, and physical safeguards appropriate to the operator's size and complexity, the nature and scope of its activities, and the sensitivity of the covered data.

Examples of appropriate administrative, technical, and physical safeguards include those described in guidance from the Federal Trade Commission, the National Institute of Standards and Technology (NIST) Cybersecurity Framework, and the International Organization for Standardization's 27001 standard for information security management.

For example, UAS operators engaging in commercial activity should consider taking the following actions to secure covered data:

⁵ This may be as simple as talking to an individual who approaches the UAS operator with a concern.

- Having a written security policy with respect to the collection, use, storage, and dissemination of covered data appropriate to the size and complexity of the operator and the sensitivity of the data collected and retained.⁶
- Making a reasonable effort to regularly monitor systems for breach and data security risks.
- Making a reasonable effort to provide security training to employees with access to covered data.
- Making a reasonable effort to permit only authorized individuals to access covered data.

5. MONITOR AND COMPLY WITH EVOLVING FEDERAL, STATE, AND LOCAL UAS LAWS

5(a) UAS operators should ensure compliance with evolving applicable laws and regulations and UAS operators' own privacy and security policies through appropriate internal processes.

V. BEST PRACTICES FOR NEWSGATHERERS AND NEWS REPORTING ORGANIZATIONS

Newsgathering and news reporting are strongly protected by United States law, including the First Amendment to the Constitution. The public relies on an independent press to gather and report the news and ensure an informed public.

For this reason, these Best Practices do not apply to newsgatherers and news reporting organizations. Newsgatherers and news reporting organizations may use UAS in the same manner as any other comparable technology to capture, store, retain and use data or images in public spaces. Newsgatherers and news reporting organizations

⁶ As with the privacy policy referenced in § IV.1(b), UAS operators may modify a broader existing security policy to incorporate data collected via UAS. A security policy should include, at minimum, such basic steps as keeping software up to date and downloading security patches for known vulnerabilities.

Voluntary Best Practices for UAS Privacy, Transparency, and Accountability

should operate under the ethics rules and standards of their organization, and according to existing federal and state laws.

APPENDIX

Guidelines for Neighborly Drone Use

Drones are useful. New, fairly cheap drones are easy to use. But just because they are cheap and simple to fly doesn't mean the pictures and video they take can't harm other people. The FAA and partner organizations have put safety guidance online at <http://knowbeforeyoufly.org>. But even safe flight might not respect other people's privacy. These are voluntary guidelines. No one is forcing you to obey them. Privacy is hard to define, but it is important. There is a balance between your rights as a drone user and other people's rights to privacy. That balance isn't easy to find. You should follow the detailed "UAS Privacy Best Practices", on which these guidelines are based, especially if you fly drones often, or use them commercially. The overarching principle should be peaceful issue resolution.

1. If you can, tell other people you'll be taking pictures or video of them before you do.
2. If you think someone has a reasonable expectation of privacy, don't violate that privacy by taking pictures, video, or otherwise gathering sensitive data, unless you've got a very good reason.
3. Don't fly over other people's private property without permission if you can easily avoid doing so.
4. Don't gather personal data for no reason, and don't keep it for longer than you think you have to.
5. If you keep sensitive data about other people, secure it against loss or theft.
6. If someone asks you to delete personal data about him or her that you've gathered, do so, unless you've got a good reason not to.
7. If anyone raises privacy, security, or safety concerns with you, try and listen to what they have to say, as long as they're polite and reasonable about it.
8. Don't harass people with your drone.

Senate Resolution No. 238 of 2015

THE GENERAL ASSEMBLY OF PENNSYLVANIA

SENATE RESOLUTION

No. 238 Session of
2015

INTRODUCED BY WILLIAMS, NOVEMBER 13, 2015

REFERRED TO STATE GOVERNMENT, NOVEMBER 13, 2015

A RESOLUTION

1 Directing the Joint State Government Commission to conduct a
2 study regarding the use of unmanned drones by State and local
3 agencies, including law enforcement agencies.

4 WHEREAS, In order to protect the Fourth Amendment rights of
5 the residents of this Commonwealth, knowledge of the use of
6 unmanned drones by State and local agencies, including law
7 enforcement agencies, is necessary; therefore be it

8 RESOLVED, That the Senate direct the Joint State Government
9 Commission to conduct a study regarding the use of unmanned
10 drones by State and local agencies, including law enforcement
11 agencies; and be it further

12 RESOLVED, That in conducting the study, the Joint State
13 Government Commission solicit input from all key stakeholders,
14 including, but not limited to, all State agencies authorized
15 under the executive branch, all county and municipal agencies,
16 including law enforcement agencies and school districts; and be
17 it further

18 RESOLVED, That the study include information on all of the
19 following:

1 (1) Unmanned aerial systems technology, including its
2 availability and capability.

3 (2) Drone technology, including how and where it can be
4 used.

5 (3) The current and planned use of drone technology by
6 State and local agencies, including law enforcement agencies,
7 within this Commonwealth.

8 (4) The use of drone technology by other state and local
9 agencies, including law enforcement agencies, outside of this
10 Commonwealth;

11 and be it further

12 RESOLVED, That the Joint State Government Commission submit
13 its findings to the General Assembly no later than January 1,
14 2017.

