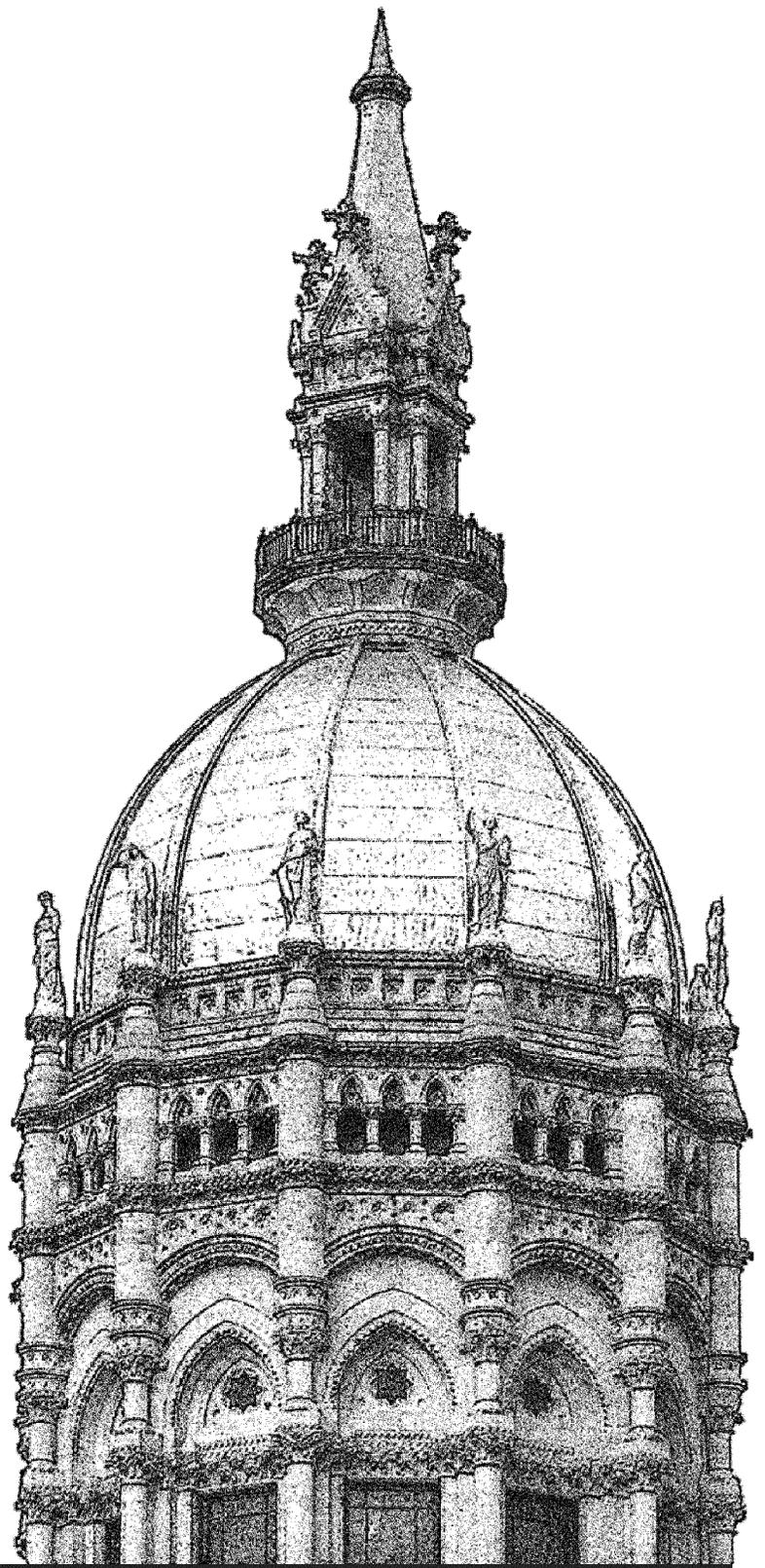


# Drone Use Regulation

December 2014



**PRI**

**Legislative Program Review and  
Investigations Committee**

Connecticut General Assembly

**CONNECTICUT GENERAL ASSEMBLY  
LEGISLATIVE PROGRAM REVIEW AND INVESTIGATIONS COMMITTEE**

The Legislative Program Review and Investigations Committee is a bipartisan statutory committee of the Connecticut General Assembly. It was established in 1972 to evaluate the efficiency, effectiveness, and statutory compliance of selected state agencies and programs, recommending remedies where needed. In 1975, the General Assembly expanded the committee's function to include investigations, and in 1985, it gave the committee the authority to raise and report bills. In 1977, the committee also acquired responsibility for “sunset” (automatic program termination) performance reviews. The state’s sunset law, however, was amended in 2012; PRI is still involved, but the legislature’s subject matter committees have roles as well.

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LEGISLATIVE PROGRAM REVIEW  
& INVESTIGATIONS COMMITTEE

Drone Use Regulation

DECEMBER 2014

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## Drone Use Regulation

### Background

In June 2014, the program review committee authorized a study of drone use regulation. The study focused on current and potential drone use regulation in Connecticut. Drones are any unmanned, powered aircraft that sustain flight through remote operation, autonomous control, or some combination of the two.

The 2012 Federal Aviation Authority (FAA) Modernization Act distinguishes between three different types of drones – civil, public, and model aircraft. These drone types are defined by their physical characteristics and by the purpose for which they are being used.

The federal distinction between unmanned aerial systems (UAS) and model aircraft is problematic, as the same aircraft can be considered model aircraft or not depending on the use, user, or location of the drone in proximity to the user. Model aircraft are exempt from most FAA regulation, while non-model aircraft and their users are subject to FAA certification requirements.

Within the last two years, 20 states have passed legislation directly dealing with drones, while almost all states have considered some legislative action. Because of the recency of state regulatory efforts, no determination of the efficacy of the regulations was possible at this time.

Program review staff relied on data from the National Conference of State Legislators for review of legislative efforts in other states. Drone laws adopted or considered by other states were examined through primary examination and review of stakeholder and academic criticisms of the laws. Stakeholders representing a variety of interests, including drone users, law enforcement agencies, legal experts, and privacy advocates were interviewed as part of a study process. A panel discussion regarding law enforcement interaction with drones was held on October 8, 2014.

### Main Findings

**Connecticut stakeholder concerns about drone use are primarily about privacy and safety.** Some Connecticut stakeholders expressed interest in commercial use of drones, and are concerned that lack of timely FAA regulations limits the potential positive economic impact of drones.

**Most jurisdiction for aircraft regulation is at the federal level**, including authority regarding: regulation of the navigable airspace; aircraft operation; setting airworthiness standards; and, pilot licensing or certification requirements. Draft federal regulations for use of small drones (i.e., under 55 pounds) for commercial purposes are expected to be made public sometime in 2015. Commercial drone use is regulated federally and is currently prohibited by FAA, with a few exceptions.

**State or local attempts at regulating non-governmental flight or aircraft directly are preempted by federal authority.** However, states have authority over aircraft owned or used by state and local governments.

**Most types of criminal drone use can be addressed through existing state law**, but some statutory clarification may be helpful. The same is true for civil actions.

As is existing practice for manned craft, **state and local governmental safety protocols for drones should be at least as stringent as FAA requirements for non-governmental aircraft.**

### PRI Recommendations

**State statutes should be reviewed and revised to reflect the existence and capabilities of drones.** Statutes regarding aeronautics, in particular, should be revised to address possible federal preemption issues.

**Remote operation of weapons, including via drones, should be prohibited.** This prohibition should be applied to both governmental and non-governmental drone users.

**Law enforcement use of drones for targeted surveillance should be limited in duration unless there is probable cause and a warrant.** This limitation is intended to reduce possible violation of an individual's fourth amendment rights, while allowing law enforcement access to possible beneficial uses of drones. **The legislature should adopt a drone-based data retention policy for all state and local law enforcement agencies.**

**All state and local governmentally-owned drones should register with the Office of Policy and Management (OPM).** Registration data on governmentally-owned drones should be publicly published on a regular basis. **Governmental drone use should be recorded, summarized, and publicly reported in an aggregate format annually.**

## Acronyms

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CAA	Connecticut Airport Authority
COA	Certificate of waiver or authorization
FAA	Federal Aviation Authority
NCSL	National Conference of State Legislatures
NTSB	National Transportation Safety Board
UAS	Unmanned aerial system
UAV	Unmanned aerial vehicle

# Executive Summary

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## Drone Use Regulation

In June 2014, the Legislative Program Review and Investigations Committee authorized a study of drone use regulation, with a focus on current and potential drone use regulation in Connecticut. Drones are unmanned aircraft, which are also referred to as unmanned aircraft systems (UAS) or unmanned aerial vehicles (UAV). Typically, drones are operated via remote-control using radio frequencies, but can also operate semi-autonomously via internal computer. Varying in size, drones may be small enough to fit in a hand or have wingspans that rival passenger airplanes.

## Regulatory Authority

Most jurisdiction for aircraft regulation is at the federal level within the Federal Aviation Authority (FAA), including authority regarding: the navigable airspace; aircraft operation; airworthiness standards; and, pilot licensing or certification requirements. The 2012 FAA Modernization Act lays the groundwork for federal regulation of drones and distinguishes between three different types of drones – civil, public, and model aircraft. These drone types are defined by their physical characteristics and by the purpose for which they are being used.

The federal distinction between UAS and model aircraft is problematic, as the same aircraft can be considered model aircraft or not depending on the use, user, or location of the drone in proximity to the user. Model aircraft are exempt from most FAA regulation, while non-model aircraft and their users are subject to FAA certification requirements.

Within the 2012 Modernization Act, commercial use of drones is regulated differently than either governmental use or recreational use. As of late 2014, commercial use is currently prohibited by FAA, with a few exceptions. Draft federal regulations regarding small drones used for commercial purposes were expected to be made public sometime in late 2014 or early 2015.

**State authority.** State or local attempts at regulating non-governmental flight or aircraft directly are preempted by federal authority. However, states have authority over aircraft owned or used by state and local governments. Since the start of 2013, 20 states have passed legislation directly dealing with drones, while almost all states have considered some legislative action regarding drones.

Of the 20 states that have adopted legislation, 15 states have passed laws attempting to regulate drone use in some way. Of those 15, all but one have limited law enforcement use in some manner. The other five states that have passed drone laws have done so to fund drone test sites, drone research, or both.

Though Connecticut's current statutes do not directly refer to drones, there are instances where drone use seems to be covered under existing law, especially for statutes pertaining to aircraft more generally. Some aeronautics statutes have been made obsolete through a combination of changes in aviation technology and reorganization of state government.

*Recommendations 1, 2, and 3 address revision of Connecticut law to recognize and address drones or otherwise clarify when existing law applies to drones.*

## **Stakeholder Concerns**

The most commonly expressed concerns about drone use in the state are issues of privacy and safety, which can be at odds. Program review staff interviewed representatives of several stakeholder groups in an effort to understand the range of concerns that exist surrounding drone use.

**Criminal use of drones.** One prominent theme is worry about the use of drones by private individuals to invade the personal privacy of others – namely, use of drones to capture images and videos of others without their consent or knowledge. Most types of criminal drone use can be addressed through existing state law, but some statutory clarification may be helpful. There is also some concern that drones can be used to remotely control weapons to intentionally harm persons or property. In the course of this study, the risks and dangers of drones being used to control weapons were deemed by stakeholders to far outweigh any potential benefits of allowing the public such a practice. *Recommendations 4, 5, and 6 address potential criminal use of drones.*

**Commercial use of drones.** Some Connecticut stakeholders expressed interest in commercial use of drones. They are concerned that lack of timely FAA regulations limits the potential positive economic impact of drones. Some states have passed laws restricting certain commercial uses, most commonly prohibiting the capture and distribution of certain images produced with the assistance of a drone. In some cases, these laws, like FAA rules, distinguish between commercial use and private use. Such laws seem overly difficult to enforce, as determining whether a drone is being used for recreation or commercial activity is difficult at the time of the activity and may change after the actual drone use (e.g., a hobbyist takes pictures with a drone and later decides to sell an image).

Based on staff interviews and literature review, there appears to be consensus between various stakeholder groups that any state restrictions on non-governmental use of drones should be neutral to the type of drone user (i.e., commercial or hobbyist). For instance, the state could choose to restrict the launching, landing, or operation of drones in the direct proximity of active crime scenes. If a restriction like this were adopted by a state, it should apply to private citizens and commercial uses (e.g., journalists) alike, and not just one group or the other. *Recommendation 7 discourages state level commercial-only drone laws, at least until federal regulations are developed.*

**Governmental use of drones.** Another aspect of the stakeholder privacy concern is that drones may erode society's expectations of an individual's right to privacy more generally, especially with regard to enabling law enforcement greater access to personal information. Several regulatory framework options address different aspects of drone-related concerns. Two extreme options (i.e., taking no legislative action or placing a moratorium on governmental drone use) are considered, as well as more moderate regulatory paths. There are many permutations of these and other policies that might also address the underlying balance of privacy and safety concerns. Some regulatory efforts immediately provide specific legislative direction to potential

governmental drone users, sometimes at the cost of future flexibility – an important consideration when dealing with emerging and evolving technologies.

Given that there are many potential beneficial uses of drones by law enforcement (e.g., search and rescue) or other governmental agencies (e.g., surveying of properties), there does not appear to be a need to institute a general moratorium on use. Likewise, taking no legislative action largely leaves the decision making on these issues to the judicial system. Adopting regulation through precedent via the judicial system will take considerable time and will be reactionary – only producing new law after a potential misuse is challenged.

The report concludes that two general approaches are viable: broadly prohibiting drone use, then allowing specific uses; or broadly allowing drone use and prohibiting specific uses. Both can address the perceived need for regulatory action to maintain an individual’s freedom from unreasonable search or seizure while permitting certain law enforcement efforts that should make the same individual safer. However, a broad prohibition on drone use with exceptions would potentially stifle the development of new, potentially beneficial uses that may not be specifically addressed within the exceptions.

The program review committee concludes that the best option is to specifically prohibit those governmental actions or uses that seem likely to tip the balance between privacy and safety past the point where most stakeholders feel the tradeoff of one for the other may be worthwhile. In particular, the uses that were recommended to be limited or prohibited were targeted surveillance efforts and weaponization of drones. *Regulation of governmental drone use, including registration, use reporting, and drone-based data collection and retention policies, is addressed by recommendations 8 through 13.*

### **List of Recommendations**

- 1. The statutory definition of “aircraft” in C.G.S. Sec. 15-34 (5) shall be amended to indicate that the term includes both manned aircraft and unmanned aircraft. Definitions of both manned and unmanned aircraft shall be adopted within statute, to allow proper differentiation when the term “aircraft” is found to be overly broad. Also, a subset of unmanned aircraft shall be defined as “small unmanned aircraft” when such unmanned aircraft weigh less than 55 pounds.**
- 2. The Connecticut Law Revision Commission shall review all state aircraft- and aeronautic-related statutes. The review shall include a determination of whether the statutes continue to be useful to the state, particularly for safety, privacy, or financial reasons. The review shall also determine when and if certain statutes should pertain only to a subset of aircraft, such as manned aircraft or small unmanned aircraft. The review should prioritize repealing statutes that are preempted by federal authority.**
- 3. Unmanned aircraft shall be exempt from the aircraft registration requirements of C.G.S. Secs. 13b-39a to 13b-39d inclusive for a period of ten years.**
- 4. The term “in plain view” as used in C.G.S. Sec. 53a-189a shall be defined to exclude any view obtained through the use of technology, including drones.**

5. Remote operation, including through the use of drones, of deadly or dangerous weapons shall be prohibited.
6. The presence of restricted items (e.g., weapons or controlled substances) on, in, or otherwise attached to unmanned aircraft shall be presumptive evidence of the possession of said items by the unmanned aircraft operator.
7. No laws specific just to commercial drone activity should be adopted in the state until at least such time as relevant federal unmanned aircraft regulations are adopted and can be reviewed.
8. The use of drones by Connecticut law enforcement agencies for surveillance of a specific individual or a privately-held property is prohibited except with the person or property owner's consent or when the duration of such drone-based surveillance is limited to the following conditions:

**Drone-based surveillance of a specific individual or a privately-held property:**

- a) with reasonable suspicion of criminal activity, but without the combination of probable cause and a valid warrant, shall be limited to 24 hours total cumulative duration within a 30-day time period; and
- b) with probable cause and a valid warrant, shall be limited to the terms of the warrant.

A person or privately-held property shall not be considered the target of such surveillance unless the person or property is identifiable via the drone's imaging or other information-gathering device or is otherwise acknowledged as the intended target of such surveillance.

9. A drone-based data retention policy shall be established for all law enforcement agencies within the state, as follows. Data collected via drone outside the terms of a warrant (either when no warrant was involved or when the data collected was incidental to the terms of a valid warrant) shall be reviewed within three months of collection.

If such data contains identifiable images of persons or property about whom there is no reasonable suspicion of criminal activity, the data shall be destroyed as soon as reasonably possible following the review.

If the data contains identifiable images of persons or property about whom there is a reasonable suspicion of criminal activity, the data may be retained for up to five years from the date of collection, unless a valid search or arrest warrant is issued in connection with the criminal activity captured in the data, in which case the data may be retained under the terms of the warrant.

If data is collected that contains identifiable images of persons or property across several classification (e.g., target of the warrant or a person about whom there is no reasonable suspicion), modifying the data to remove or otherwise make unidentifiable

**just those images of persons of property for which there is no reasonable suspicion shall fulfill the terms of this policy.**

- 10. All state and local government-owned drones shall be registered with the Office of Policy and Management. The registration shall include the name of the government agency that owns the drone, the name(s) and contact information of those individuals who may operate the drone, and identification of the aircraft (at minimum make, model, and serial number). Such information shall be made available on the agency's website and updated monthly if additional aircraft are registered.**
- 11. All non-law enforcement state use of drones, including drones operated for the benefit of the state that are not owned by the state, shall be recorded and reported to the Office of Policy and Management annually. Such reports shall include the location, time, duration, and purpose of each drone use. The Office of Policy and Management shall publish aggregate summaries of these reports within 90 days of the annual reporting deadline, including identifying those agencies with drone ownership or past drone use that have failed to report on drone use.**
- 12. All state and local law enforcement use of drones, including drones operated for the benefit of the law enforcement activities that are not owned by the law enforcement agencies, shall be recorded and reported to the Office of the Chief State's Attorney annually.**

**Such reports shall include the location, time, duration, and purpose of each drone use, along with whether the drone use was conducted within the limits of a warrant. Law enforcement agencies shall report the frequency with which data obtained from a drone was deemed to provide evidence of reasonable suspicion of criminal activity, how often data was reviewed and destroyed under the data retention policy recommended above, and how often data was destroyed without being reviewed.**

**The Office of the Chief State's Attorney shall publish aggregate summaries of these reports within 90 days of the annual reporting deadline, including identifying those agencies with drone ownership or past drone use that have failed to report on drone use.**

- 13. Law enforcement use of drones to remotely operate weapons shall be prohibited.**



# Introduction

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## Drone Use Regulation

In June 2014, the Legislative Program Review and Investigation Committee approved a study of drone use regulation. This report completes that study, with a focus on examining how drones are regulated under current law and how they might be regulated by the state.

The most common concerns about drone use in the state are issues of privacy and safety, which at times can be at odds. Program review staff interviewed representatives of several stakeholder groups in an effort to understand the range of concerns that exist surrounding drone use. One prominent theme is worry about the use of drones by private individuals to invade the personal privacy of others – namely, use of drones to capture images and videos of others without their consent or knowledge. An extension of this is concern that drones may erode society’s expectations of an individual’s right to privacy more generally, especially with regard to enabling law enforcement greater access to private information.

Drones may provide some benefit through safer working and living conditions, as well as possible assistance in life-threatening situations. For example, drones may be used in: helping to find missing persons more swiftly; providing information from an area or viewpoint that would be inaccessible without a drone; or keeping law enforcement officers out of harm’s way when dealing with potentially dangerous circumstances.

However, safety is also a concern when it comes to the operation of the drones themselves. Some people are worried about drones as falling hazards, while others fear drones may be used in actively harmful ways (e.g., bomb delivery). There is also concern over the possible negative interaction between drones and manned aircraft.

Stakeholders have also brought up issues about the economics of drones. There is the possibility that the manufacture of drones could bring jobs or money to the state economy. Various stakeholders see the potential for drones to make current services better, quicker, or cheaper, and do not want those options taken away (from the public or government). As with many technological developments, there is also the potential that drones replace some duties of certain jobs, ultimately leading to fewer jobs in those areas.

Connecticut is one of the majority of states that has yet to pass a regulatory drone law. There have been a few high-profile incidents regarding private use of drones in the state, including local news coverage of a handful of uses. At the time of this study, no drones are currently owned or being used for state government or law enforcement functions within Connecticut at this time. While drones have been used to aid in emergency situations on a couple of occasions, the drones used were not owned by state or local governmental organizations.

In the 2014 legislative session, a bill was raised that addressed some aspects of drone regulation. Specifically, the 2014 bill (H.B. 5217) limited law enforcement use of drones to emergencies or when use is authorized by a warrant. It added penalties for certain uses of drones

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more generally, and also clarified criminal penalties for certain drone uses. Response to the bill, as demonstrated in the testimony received by the Judiciary Committee, was mixed, depending on the stakeholder group viewpoint. Some of the testimony called for deliberately-paced development of any regulations, including further study of the issue. This study is intended to help address those concerns, as well as determine what actions may be necessary to regulate drones in the state, what the legislature can do without crossing into federal authority, and what, if anything, the legislature should do to ensure concerns over drone use are mitigated.

**Methodology.** Program review staff, with assistance from the Office of Legislative Research and the Legislative Commissioners' Office, interviewed several different stakeholders and stakeholder groups within the state, reviewed legislation adopted in other states, examined a sample of proposed recommendations in other states, and reviewed some of the testimony and media reports about legislative proposals from outside of Connecticut. On October 8, 2014, the program review committee held a drone demonstration at the Capitol, followed by a panel discussion of drone use stakeholders and an informational public hearing.

**Report organization.** This report contains six chapters. The first chapter discusses drone definitions and types. Federal regulatory authority and actions are described in Chapter II. Chapter III provides an examination of how drones might be addressed under current law. Chapter IV describes other states' legislative efforts regarding drones. The fifth chapter describes and proposes certain legislative actions regarding non-governmental drone use, while the final chapter does the same regarding governmental drone use.

## Drone Descriptions and Definitions

Drone is the most common name used for unmanned aerial systems (UAS) or unmanned aerial vehicles (UAV). This class of vehicle refers broadly to any unmanned, powered aircraft that sustains flight through remote operation, autonomous control, or some combination of the two. This chapter provides further description of the range of drone types, capabilities, and definitions.

## Drone Styles and Uses

Drones come in many different forms and span a vast range of size. Drones can be as large as commercial airliners or small enough to fit in the palm of one’s hand. Similarly, the weight of small drones can be less than a pound whereas large drones can go up to several tons.

Styles of drones generally fall into two basic categories – fixed wing and helicopter. Fixed wing craft have the same basic design as manned airplanes. Helicopter type drones, often called quad-copters when they use four separate propellers, are generally capable of vertical takeoff and landing. To get a better sense of the range of drone types, Table I-1 provides some details of a few examples of common drones:

Drone Name	MQ-1 Predator	Phantom 2 Vision	Hubsan X4 (H107c)	ShadowHawk
Manufacturer	General Atomics	DJI	Hubsan	Vanguard Defense Industries
Type	Fixed wing	Quadcopter	Quadcopter	Helicopter
Target Users	Military	Hobbyist/ Commercial	Hobbyist	Military/ Law Enforcement
Dimensions	55 ft. wingspan 27 ft. long	~ 16" wingspan 14" diagonal	less than 3" x 3"	86" L x 17" W x 30" H
Weight	2550 lbs.	~ 3 lbs.	~ 1 lbs.	49 lbs.
Payload Capacity	450 lbs. int./ 300 lbs. ext.	< 2 lbs.	-	22 lbs.
Non-flight equipment	Weapons/Camera	HD Video Recorder	SD/HD Video Recorder	Weapons/Camera (military only)
Flight Time Estimate	40 hours	25 minutes	~ 7 minutes	45 - 180 minutes
Source: PRI analysis of manufacturers’ technical information and reviews				

At their core, drones are substantially similar to manned aircraft in their wide array of designs, uses, and users. While there are not yet unmanned equivalents to every type of manned aircraft, automated control technology, such as those currently being tested and used in self-

driving cars, is expected to quickly advance to greatly reduce many disadvantages to using unmanned aircraft.

## **Drone Definitions**

While this study uses the term drone inclusive of the entire range of unmanned powered aircraft, federal law includes several different terms for different subsets of the broader category of drones. The FAA Modernization and Reform Act of 2012 defines unmanned aircraft as “an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft” and unmanned aircraft system as “an unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system.”

Generally, all drones fit the basic FAA definition of unmanned aircraft. However, the 2012 law distinguishes between three subgroups of unmanned aircraft for federal regulatory purposes: governmental unmanned aircraft systems, commercial/private unmanned aircraft systems, and model aircraft. The definitions of drone subgroups include provisions based on the purpose the drone is being used for, rather than exclusively on technical specifications or characteristics of the equipment itself. The distinction between subgroups of drones is noteworthy, as each group is regulated differently by the FAA.

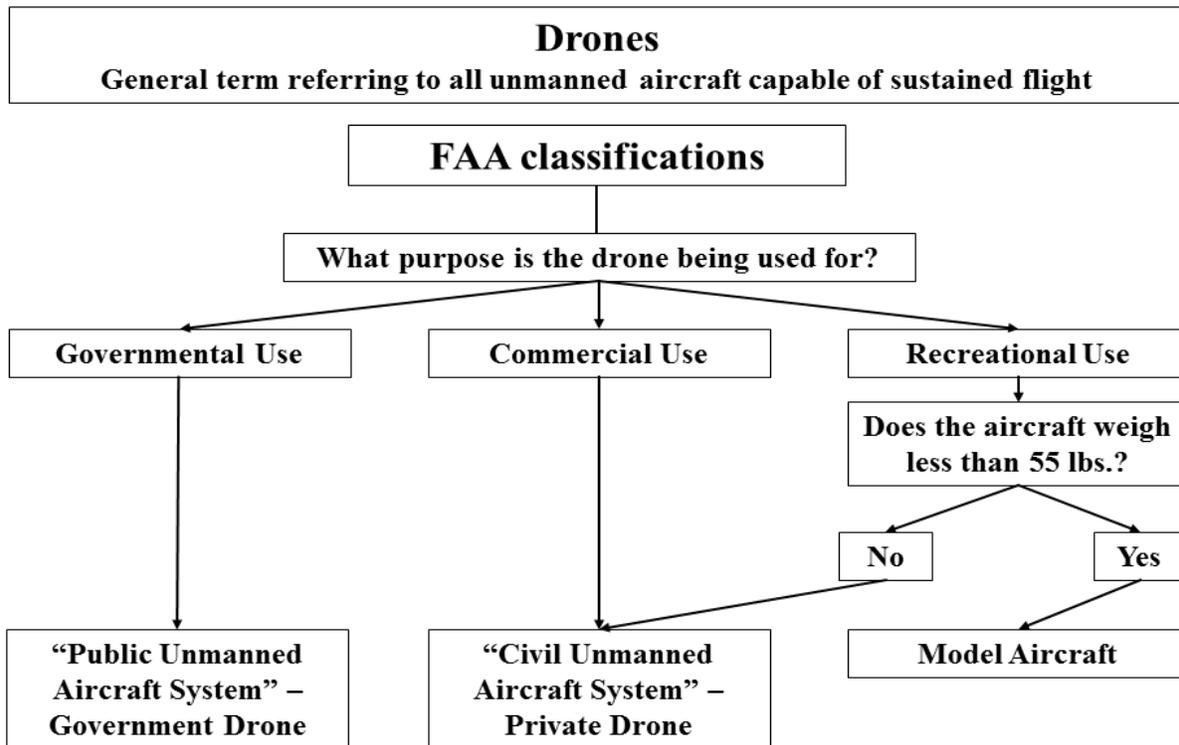
If a drone is used for a governmental or commercial purpose, it is classified by that purpose, regardless of the size, shape, or capabilities of the drone itself. The FAA definition of governmental drones includes any drone being used while performing a governmental function. The commercial group includes any drone being used for monetary benefit.

Though not differentiated by the Federal Aviation Authority (FAA), there are two main subgroups of commercial users: 1) those using drones exclusively on private property (e.g., a realtor using a drone to capture images of a client’s house, or a camera operator using drones to film a particular shot of a movie on a privately owned set); and 2) those using drones in public space or across multiple private/public boundaries (e.g., journalists using drones to capture video of newsworthy events, or drone package delivery). Figure I-1 provides a flowchart for FAA drone classification.

The FAA defines model aircraft as a drone that “is capable of sustained flight in the atmosphere, flown within visual line of sight of the person operating the aircraft, and flown for hobby or recreational purposes.” Model aircraft have additional guidelines, typically including a 55 pound weight maximum.

Concerns have been raised with the federal definition of model aircraft, as it excludes some vehicles from the classification because of how or where the device is used. This can create confusion within the definitions, as the same model drone with the exact same specifications can be considered by the FAA to be both a model aircraft, exempt from most FAA restrictions, when used by one person or for one purpose (i.e., recreationally) or a UAS, subject to strict FAA regulation, when used by another person or for another purpose (i.e., commercially).

**Figure I-1 FAA Drone Classifications**



Source: PRI staff

**State definitions of drones.** At least four states have adopted their own statutory definition of drones (or a synonymous term), though each definition is limited to the context of each state’s statutes. Those definitions are:

- Florida (Chapter 2013-33): “Drone” means a powered, aerial vehicle that:
  1. Does not carry a human operator;
  2. Uses aerodynamic forces to provide vehicle lift;
  3. Can fly autonomously or be piloted remotely;
  4. Can be expendable or recoverable; and
  5. Can carry a lethal or nonlethal payload.”
- Illinois (Chapter 170): “Drone” means any aerial vehicle that does not carry a human operator.”
- Montana (Chapter 377): “Unmanned aerial vehicle” means an aircraft that is operated without direct human intervention from on or within the aircraft. The term does not include satellites.”
- Oregon (Chapter 686): “Drone” means an unmanned flying machine. “Drone” does not include a model aircraft as defined in section 336 of the FAA Modernization and Reform Act of 2012 (P.L. 112-95) as in effect on the effective date of this 2013 Act.”



### **Drone Regulatory Authority**

Most jurisdiction for aircraft regulation is under the FAA, excepting some aspects of state and local governmental aircraft. This includes authority regarding: regulation of the navigable airspace; operation of aircraft; setting airworthiness standards; and, establishing pilot licensing or certification requirements. State or local attempts at regulating flight or aircraft directly are generally preempted by federal authority over national airspace. States have authority over aircraft owned or used by state and local governments, including the ability to place limits on drone use for governmental purposes and/or by government employees in the course of their job responsibilities. This chapter provides information on current federal regulatory authority and efforts, and outlines areas where states are most likely to be able to act.

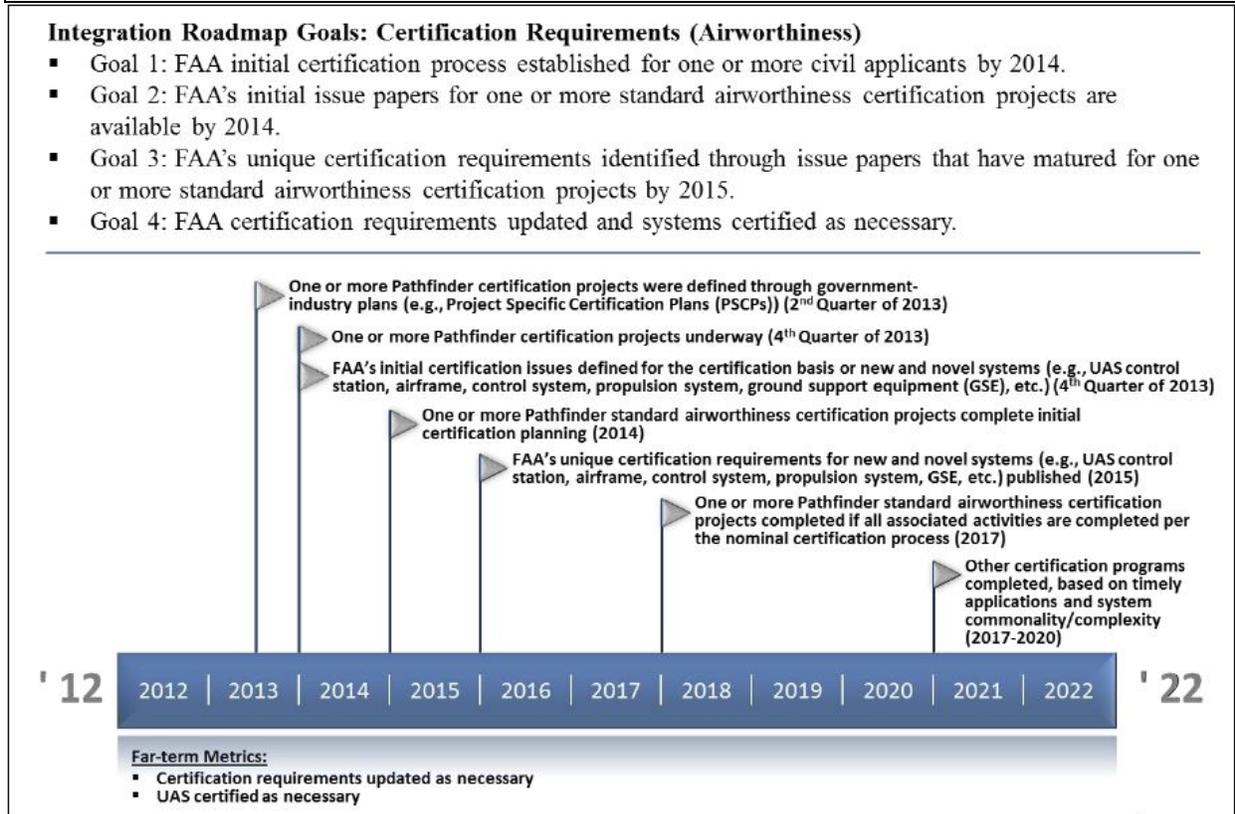
### **Federal Regulation of Drones**

Regulation of drones primarily falls to the FAA, but some drone-related areas are outside FAA jurisdiction. Restrictions and requirements about flight, most aircraft, and most operators are controlled by the FAA. A major exception is that the FAA does not certify the airworthiness of governmental aircraft, as it does with commercial or private commercial aircraft.

As part of the 2012 FAA Modernization Act, the FAA was directed to “develop a plan to accelerate the safe integration of unmanned aircraft systems (UAS) into the national airspace system” no later than September 30, 2015. As part of this charge, in 2013 the FAA developed a roadmap and comprehensive plan to achieve such purposes. The plan details the goals of the agency to set up various aspects of drone regulation (e.g., certification requirements for drones and drone operators). One aspect of this, certification requirements of airworthiness, is summarized in the timeline presented in the document, shown in Figure II-1 (next page).

While pursuing the 2015 deadline, the FAA has been changing, updating, and implementing various drone-related policies. The agency has worked with multiple public partners to set up six drone test sites throughout the country – Alaska, North Dakota, Nevada, New York, Texas, and Virginia. These test sites were created to inform the drone regulations being developed by the FAA while allowing the drone industry to test drones, or components of drones, in a controlled setting.

**Figure II-1 FAA 2013 Comprehensive -Plan Certification Requirements Timeline (page 13)**



**Federal drone use waivers.** While regulations are pending, use of non-model aircraft is prohibited, except when users have obtained a certificate of authorization (COA) for governmental use or a “special airworthiness certification” for private or commercial use. The number of governmental users is strictly limited, though much higher than the number of allowed commercial uses. Governmental uses are currently only allowed under the terms of a certificate of waiver or authority (COA) issued by the FAA to a governmental sponsor for a particular use. The COAs themselves are generally issued for a limited duration. In a January 2014 fact sheet on FAA drone regulation, the FAA indicated there were 545 active COAs as of December 4, 2013. The total number of COAs issued by year is shown in Table II-1. Program review staff obtained information from the FAA showing that at least eight COAs were approved for Connecticut higher education institutions for research purposes, all of which were sponsored by either Central Connecticut State University or the University of Connecticut.

Year	# of COAs
2009	146
2010	298
2011	313
2012	257
2013	373*
*As of October 31, 2013	
Source: FAA	

**Commercial uses.** Almost all commercial drone use is currently prohibited. By December 2014, a limited number of special airworthiness certifications have been put in place to allow commercial operation of drones. Of the eight total certificates, two are restricted to certain locations in Alaska and the others were for six filmmaking companies given FAA approval to use drones commercially in certain, controlled situations.

Once allowed more generally, drones have the potential to be used for commercial activity in many ways. There have been some high-profile examples of attempts to use drones for delivery of goods, but the most practical current use of drones is in capturing images or sound. For example, drones can help a photographer create pictures or videos from vantage points not normally accessible. Drones may also be helpful in developing house profiles for real estate transactions. There are also numerous ways in which drones may be used to help survey agricultural areas.

**Model aircraft.** Within the FAA’s drone regulatory authority comes an exemption for model aircraft. These aircraft remain under FAA jurisdiction, but the rules and laws that apply to them differ from those that apply to non-model aircraft. Historically, model aircraft were subject to guidelines based on industry best practices, rather than to specific enforceable law or regulation through the FAA, except when such aircraft interfered with non-model aircraft. The guidelines for model aircraft included rules to keep model aircraft out of the airspace used by larger, non-model craft – namely, that model aircraft need to remain below 400 feet elevation to avoid larger crafts, most of which have a 500 feet minimum elevation. Many drones on the market today, especially those available to the general public, can fall under the model aircraft exemption based on their size. However, they may be excluded from this classification, and thus subject to more strict regulation, when used for a commercial or governmental purpose.

**Current litigation.** The combination of the FAA’s broad definition of what constitutes commercial drone use and the effective prohibition on commercial use of drones has led to legal challenges on several fronts. In particular, two sets of cases have tested FAA rules interpretations.

*FAA v. Pirker.* In *FAA v. Pirker*, the FAA assessed a fine of \$10,000 on a photographer based on his having operated a drone “in a reckless manner.” The photographer, Raphael Pirker, used a drone to capture video footage of the University of Virginia, which had hired the photographer to create a promotional video for the university. The photography took place in October 2011, before the FAA Modernization Act of 2012.

In early 2014, a National Transportation Safety Board (NTSB) administrative law judge dismissed the case on the grounds that the drone used was a “model aircraft,” not a UAS as specified by the FAA, and as such its operator was only subject to the voluntary guidelines for model aircraft use. Upon FAA appeal of the initial decision, NTSB overturned the administrative decision, as a matter of statutory interpretation. NTSB came to a different statutory interpretation conclusion based on a plain language reading of the aircraft definition, and found that “model aircraft” are “aircraft” for the purposes of FAA regulation of “reckless or careless” operation.

The initial dismissal of this case was seen by some as a blow to the FAA’s authority to limit commercial use of drones prior to the pending rollout of official regulatory efforts in 2015. However, the overturned administrative decision challenges that and means that the case will be tried on its merits at some future date. It is not clear that precedent on commercial drone use will be set by this case, since one factor in the case’s dismissal was that the incident occurred before a distinction was made between model aircraft and drones within the 2012 act. It may be that a similar incident occurring today would be ruled on differently.

*Interpretation of the Special Rule for Model Aircraft.* In June 2014, the FAA issued a document entitled “Interpretation of the Special Rule for Model Aircraft.” The stated purpose of the document was to clarify that: “Model aircraft must satisfy the criteria in the Act to qualify as model aircraft and to be exempt from future FAA rulemaking action; and consistent with the Act, if a model aircraft operator endangers the safety of the National Airspace System, the FAA has the authority to take enforcement action against those operators for those safety violations.” The timing of the interpretation came after the Pirker case dismissal, so it is likely the new interpretation was informed by and related to the case.

Prior to the act and the recent rule interpretation, FAA authority over model aircraft was limited to “encourag[ing] voluntary compliance” with standards created by the model aircraft community. A strict reading of the recent rule interpretation seems to suggest that model aircraft that fail to follow the new guidelines are no longer to be considered model aircraft at all, putting them in violation of the FAA drone use policy while reclassifying them as non-model drones. This is explicitly the case for drones used for commercial activity, but users of drones not following other guidelines (e.g., the requirement to maintain line of sight contact with the drone) may find their drone reclassified, and their use thereof subject to FAA enforcement action well beyond the limited actions historically available towards model airplanes.

The rule interpretation prohibits some commercial activities that have been commonplace for model aircraft for decades. This is a major concern to some stakeholders, especially those long-time model aircraft hobbyists who routinely perform demonstrations at trade shows but can no longer receive payment for this as they may have in the past. Some universities are also concerned that the new rules may restrict research within the aeronautics field. Consequently, as of August 2014, the rule interpretation was challenged in the U.S. Court of Appeals for the District of Columbia in three different law suits. There has not yet been FAA comment on the challenge. No further action was taken during the time of this study.

**Use of drones on private property.** There remain unanswered questions about the FAA’s jurisdiction on or over private property. The FAA specifically addresses the possibility of using commercial drones on private property in a document titled “Busting Myths about the FAA and Unmanned Aircraft,” saying “[y]ou may not fly a UAS for commercial purposes by claiming that you’re operating according to the Model Aircraft guidelines (below 400 feet, 3 miles from an airport, away from populated areas.) Commercial operations are only authorized on a case-by-case basis. A commercial flight requires a certified aircraft, a licensed pilot and operating approval.” However, FAA authority to regulate flight on private property is not a settled issue.

The FAA controls the national airspace, which is deemed a “public highway.” However, there is not a clear delineation of where the public airspace ends and where private property begins. The closest thing to a demarcation of how far private property extends into the sky comes from the U.S. Supreme Court ruling on *United States v. Causby*, 328 U.S. 256 (1946), which held that flying aircraft at 83 feet from the ground was so low as to have a material negative impact on the property owner. Use of space at and below 83 feet was deemed a taking under the fifth amendment of the U.S. Constitution and, therefore, the space below 83 feet was not part of the public highway that is the national airspace in this case. But the 83 feet line is not specifically codified elsewhere as a clear minimum or maximum of the extent of the public highway.

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While the FAA can regulate drones, including those below 400 feet, it may be limited in its oversight of flight that is strictly within the bounds of private property – that is, from ground level to some unspecified elevation. The FAA can regulate non-governmental aircraft, including drones that fall under the model aircraft exemption by the technical specifications of the vehicle, though the extent of rulemaking on model aircraft is specifically limited by the 2012 FAA Modernization Act. However, the FAA’s interpretation of what constitutes commercial use is very broad, so this aspect of the model aircraft definition is potentially problematic.

The use of drones, commercial or not, relatively near the ground strictly by people on private property they own or with the permission of the landowner (e.g., for wedding photos, real estate listings, or production of films) may eventually be regulated differently than the use of drones above multiple properties or in public spaces (e.g., for delivery of goods or survey or mapping of land). However, at this time, the FAA does not recognize a distinction between these two types of commercial use.

### **State Regulatory Authority**

State and local governments can place restrictions on use or users of their own aircraft that would be preempted by FAA authority were they applicable to non-governmental uses or users. In regard to potential state or local drone regulation, the FAA released the following as part of a January 2014 Fact Sheet:

*A number of states and municipalities have passed or are considering limitations on unmanned aircraft. The effect of such restrictions depends on the precise nature of the limitation.*

*By law, the FAA is charged with ensuring the safe and efficient use of U.S. airspace. This authority generally preempts any state or local government from enacting a statute or regulation concerning matters – such as airspace regulation – that are reserved exclusively to the U.S. Government.*

*For example, a state law or regulation that prohibits or limits the operation of an aircraft, sets standards for airworthiness, or establishes pilot requirements generally would be preempted. But state and local governments do retain authority to limit the aeronautical activities of their own departments and institutions. Under most circumstances, it would be within state or local government power to restrict the use of certain aircraft, including a UAS, by the state or local police or by a state department or university.<sup>1</sup>*

Because this is an area of emerging technology, federal regulation has been, and will continue to be, in a state of flux. Because of this, the extent to which a state may make laws regarding drone use without infringing upon federal authority is subject to some interpretation. Below is a non-exhaustive list of drone issues that states may be able to regulate:

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<sup>1</sup> FAA Fact Sheet – Unmanned Aircraft Systems.  
[http://www.faa.gov/news/fact\\_sheets/news\\_story.cfm?newsId=14153](http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=14153)

- 1) States may determine how drones are used for state and local governmental functions.
- 2) States can probably choose to prohibit or allow drone operation and takeoff/landing on state-held land. But the extent to which the state can limit the presence of drones over state land is unknown. In this case, the “operation” restriction may be limited to the physical location of the operator, not the aircraft itself.
- 3) States may be able to regulate actions performed with a drone. States may have the authority to specifically prohibit the use of drones to carry or operate weapons, but it is possible limiting such regulatory efforts to drones crosses into FAA authority regarding certification and operation of aircraft. Alternatively, states may ban all remote and/or unmanned use of certain equipment, regardless of whether such equipment is used in combination with a drone.
- 4) States may be able to limit the presence, but not the flight, of a drone on other’s private property (i.e., trespassing). It is possible, though, that current trespassing law, or related laws pertaining to harassment or voyeurism, would already be applicable to drones in some manner.

The FAA has jurisdiction on all aspects of flight of the drone, so that is not an area states can regulate themselves. Of the four listed items, the least controversial is the first, which the FAA has specifically confirmed as an area of state control. The second area, limiting use on state lands, may be an area of state control, but laws concerning this aspect could have limited effectiveness if they can be circumvented by beginning and ending drone flights outside of state lands and subsequently flying over (i.e., in FAA-controlled airspace) state lands.

The third and fourth items both deal with establishing penalties for some aspect of drone use. The FAA has jurisdiction regarding when the flight of a drone, by itself, is a criminal act. States can probably add additional penalties for criminal activity performed with a drone, but those may be duplicative of the penalties for the crime in question. Likewise, states could try to criminalize certain uses of drones by focusing on the presence of a drone on private property, rather than on the flight of the drone, but it is not yet clear whether such laws would cross into federal authority. All of these options are discussed in greater length in this reports’ final two chapters.

### Drones Under Current Connecticut Law

The term “drone” is not mentioned in Connecticut state statutes.<sup>2</sup> Still, some of the state’s laws may already apply to certain aspects of drones and drone use. This chapter looks at the current legal status for different drone uses and users under existing laws, criminal or otherwise.<sup>3</sup> Also, the chapter examines how drones may be used by law enforcement agencies given existing statutes and case law.

#### Aircraft Statutory Definitions

Chapter 266 of the Connecticut General Statutes sets out a number of provisions regarding aeronautics in the state, and the Department of Transportation (DOT) and Connecticut Airport Authority (CAA) commissioners’ responsibilities to enforce them.<sup>4</sup> These provisions include a definition of “aircraft,” along with definitions of related terms. According to statute, aircraft:

*means any contrivance used or designed for navigation of or flight in air, including (A) airplanes, meaning power-driven fixed-wing aircraft, heavier than air, supported by the dynamic reaction of the air against their wings, (B) gliders, meaning heavier than air aircraft, the free flight of which does not depend principally upon a power-generating unit, and (C) rotorcraft, meaning power-driven aircraft, heavier than air, supported during flight by one or more rotors. (C.G.S. Sec. 15-34(2))*

This definition reads as inclusive of all aircraft, as it does not specify whether aircraft are manned or unmanned. The word “aircraft” is then referenced in several other definitions, such as of “operation of aircraft.”<sup>5</sup> The current statutory definition of “operation of aircraft” does not exclude drones, as there is still an operator for drones – even when drones are automated, the person programming the automation is considered the operator.

Because drones fall under the state’s broad definition of aircraft, the regulations and restrictions already in place for aircraft would also apply to drones. In some instances, this makes the current status of certain aspects of drone regulation under state law fairly clear, but in other cases this may create restrictions not intended for unmanned aircraft. For instance, under current law any “aircraft accident” that causes substantial damage to the aircraft must be reported to the

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<sup>2</sup> Neither are other commonly used synonymous terms (e.g., unmanned aircraft, unmanned aerial systems).

<sup>3</sup> As a larger matter not completely within the scope of this study, it is possible that much of the current state law pertaining to aircraft is preempted by federal law. This issue is addressed in Chapter V.

<sup>4</sup> Much of DOT authority regarding aeronautics was transferred to CAA as part of P.A. 11-84, though current statutory language does not always reflect this change.

<sup>5</sup> C.G.S. Sec. 15-24 (20) ‘Operation of aircraft’ means the use of aircraft for the purpose of air navigation and includes the navigation or piloting of aircraft. Any person who causes or authorizes the operation of aircraft, whether with or without the right of legal control thereof, shall be deemed to be engaged in the operation of aircraft within the meaning of the statutes of this state.”

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DOT commissioner or to the state police.<sup>6</sup> Since drones are covered by the blanket term “aircraft,” it would seem drone accidents, which can end with considerable damage to the drones themselves, should be reported. However, for the purposes of the reporting requirement, an “aircraft accident” is statutorily defined as:

*an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which any person suffers death or serious injury as a result of such person being in or upon the aircraft or in direct contact with the aircraft or anything attached thereto or as a result of the operation of the aircraft, or the aircraft receives substantial damage[.]”(C.G.S. 15-71b(a))*

This definition of “aircraft accident,” which refers to persons boarding the aircraft, means that unmanned aircraft are exempt from the accident reporting requirements. Similarly, the statutes regarding aircraft registrations and aircraft use of airports or helipads both have instances where drones might be included and others where drones are excluded. As such, the current state aeronautic statutes are not clear about state requirements for drone use, as the statutes that are most applicable were largely written regarding manned aircraft exclusively and without possible use of drones in mind.

### **Criminal Use of Drones**

Criminal law intersects with drone use in two main ways – instances where the use of the drone itself may be considered criminal and other cases where a non-flight based criminal act is committed through the aid of a drone. The former should generally be dealt with federally, while the latter may be addressed at different levels of government. That is, there are laws of general application that are relevant beyond only drones or aircraft. For example, there are several different felonies (e.g., assault, murder, robbery, burglary) with statutory description that is inclusive of the possession or use of a “dangerous instrument.”<sup>7</sup> Certain uses of drones fit this description by virtue of being aircraft, regardless of any other equipment the drone might be carrying. But these laws apply beyond just aircraft or drones, as there are many other examples of non-aircraft “dangerous instruments.”

The use of a weapon, deadly weapon, or dangerous instrument in the course of many crimes is already illegal. Using a drone to enable the use of the deadly weapon is generally not any different than using it directly without a drone’s involvement. Likewise, stalking is when a person “directly, indirectly or through a third party, by any action method, device or means, (1) follows, lies in wait for, monitors, observes, surveils, threatens, harasses...” a person – use of a

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<sup>6</sup> C.G.S. Sec. 15-71a

<sup>7</sup> C.G.S. Sec. 53a-3 (7) "Dangerous instrument" means any instrument, article or substance which, under the circumstances in which it is used or attempted or threatened to be used, is capable of causing death or serious physical injury, and includes a "vehicle" as that term is defined in this section and includes a dog that has been commanded to attack, except a dog owned by a law enforcement agency of the state or any political subdivision thereof or of the federal government when such dog is in the performance of its duties under the direct supervision, care and control of an assigned law enforcement officer.

drone to stalk is covered within that definition as either “indirectly” stalking or “by action method, device, or means.”<sup>8</sup>

**Weapon possession.** Possession and use of certain weapons is already illegal, so use of such weapons via a drone is also illegal. There are also statutory items that clarify what constitutes breaking a particular law or as evidence for the same. For example, the “presence of a machine gun in any room, boat or vehicle shall be presumptive evidence of the possession or use of the machine gun by each person occupying such room, boat or vehicle.”<sup>9</sup> Drones that can carry weapons appear to fit the statutory definition of “vehicle,”<sup>10</sup> but since this particular law is based on the vehicle being occupied, it remains unclear whether the presence of an illegal weapon on a drone implicates the owner of the drone for possession.

**Remote use of firearms.** Current statute prohibits the use of remote devices to operate firearms.<sup>11</sup> This implicitly includes drones within the definition of remote devices, but this statute is limited to forbidding remote hunting via computer software and does not address any remote use of firearms outside of hunting activities.

**Trespass.** One area of criminal law with very limited applicability to drones is trespassing. All degrees of trespass are described as “a person” entering a building or an area without permission or consent. As a drone is not “a person,” it is difficult to see how current law might apply here. Likewise, trespass requires either being in a building or on the premises of a location. Even if trespass could be committed by a proxy for a person, criminal trespass with a drone would most likely be done by flying in the air above a property, rather than clearly inside a building.

Current law, state or federal, does not make clear the elevation at which private property becomes public airspace. The *United States v. Causby* (1946) decision said that flying aircraft at 83 feet from the ground was so low as to have a material negative impact on the property owner, but did not make clear that this elevation was an actual demarcation of where private property ended. Without a definition of the upper elevation limits of private property, it would be difficult to argue that a drone had entered that property criminally by flying over it.

## Civil Action

A civil action is the procedure by which a person, against whom a civil wrong has been committed by another, seeks by a lawsuit to stop the wrong or be compensated for it. Civil wrongs are distinguished from criminal laws, and can be either enacted as statutes or developed in case law. In the case of drones, it can easily be imagined that a drone could fly into property not owned by the drone operator, which could, for example, lead to a civil action for trespass (as opposed to criminal) if these elements were established:

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<sup>8</sup> C.G.S. Sec. 53a-181d

<sup>9</sup> C.G.S. Sec. 53-202(e).

<sup>10</sup> C.G.S. Sec. 14-1 (100) "Vehicle" includes any device suitable for the conveyance, drawing or other transportation of persons or property, whether operated on wheels, runners, a cushion of air or by any other means. The term does not include devices propelled or drawn by human power or devices used exclusively on tracks.

<sup>11</sup> C.G.S. Sec. 26-80b.

- (1) ownership or possessory interest in land by the plaintiff;
- (2) invasion, intrusion or entry by the defendant affecting the plaintiff's exclusive possessory interest;
- (3) done intentionally; and
- (4) causing direct injury.

On the issue of whether a civil action based on state law for a drone flying over someone's backyard would be allowed, or preempted by federal authority, the common legal reference Restatement of Torts<sup>12</sup> states in a section on "Intrusions Upon, Beneath, and Above Surface of Earth" that "a trespass may be committed on, beneath, or above the surface of the earth. Flight by aircraft in the air space above the land of another is a trespass if, but only if:

- (a) it enters into the immediate reaches of the air space next to the land, and
- (b) it interferes substantially with the other's use and enjoyment of his land."

As noted elsewhere, there is no clear formula for determining the elevation that would be considered the "immediate reaches of the air space next to the land," but appears to be a case by case determination.

### **Law Enforcement Search Warrant Requirements**

In the course of criminal investigations, law enforcement agencies have several tools to access privately held areas or information. One main tool is the search warrant, required in many law enforcement activities because both the federal and state constitutions protect the rights of citizens against "unreasonable searches and seizures."

The Fourth Amendment to the United States Constitution reads: "[t]he 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." A key concept underlying the meaning of *unreasonable search* is whether the person affected has a "constitutionally protected expectation of privacy," determined by whether: 1) the person showed a subjective expectation of privacy, and 2) society is willing to recognize that expectation as reasonable.<sup>13</sup>

There are numerous situations where search warrants may be necessary, most notably for searches of homes, cars, or other private property or in searches of persons themselves. A search warrant must be authorized upon application to a judge and a showing by law enforcement officials to the judge's satisfaction there is "probable cause" that an item of interest in a criminal investigation is being held at a specific location or by a particular individual (i.e., more likely than not). In effect, the independent judicial review and consent that is necessary for a warrant to be issued for a search helps protect a person from an unreasonable search.

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<sup>12</sup> Restatement (Second) of Torts § 159 (1965)

<sup>13</sup> Katz v. United States 389 U.S. 347 (1967)

There are exceptions to the need for a search warrant. For example, a search of a person's house (or other private property) is deemed reasonable if the owner of the property consents to the search, or if there is a reasonable belief a crime is being committed or there is an imminent threat to life or safety (i.e., exigent circumstances).<sup>14</sup> A search is also deemed reasonable if it consists of items in plain view of the non-aided human eye from an appropriate vantage point, which may also involve an expectation of privacy analysis.

Use of drones raises questions in regard to search warrants because drones are potentially capable of providing viewpoints outside of those normally available to law enforcement officials. They are also capable of carrying and operating imaging equipment at those alternative viewpoints. Both advantages have already been addressed to some degree by the judicial system, but neither has been considered specifically in the context of current (or future) capabilities of drones. In particular, numerous rulings have been made on the necessity of a warrant for searches conducted using aerial surveillance and with so-called sense-enhancing devices.

**Reasonable expectation of privacy and aerial surveillance.** Aerial searches have been ruled legal so long as the information collected was visible to the unaided human eye from a public vantage point. As the national airspace is a "public highway," views from that vantage point are allowed to the public and law enforcement agents alike (via manned aircraft). Since the public has a right to that aerial view, it does not bring with it an expectation of privacy. The result here is that items on private property that can be seen from above are potentially admissible evidence even when collected without a warrant. This is true even in situations when active precautions have been taken to prevent ground-level viewing (e.g., installing a tall fence or thick vegetation). This aspect of warrant law is commonly called the open-fields doctrine.

However, the cases that have permitted aerial surveillance by law enforcement without a warrant have not had to consider some of the advantages of small, light, unmanned aircraft – namely, that drones are able to operate safely at a much lower elevation than most manned aircraft. Some of the rulings have included specific heights at which aircraft flew as limiting the expectation of privacy.<sup>15</sup> But the static elevations mentioned in those cases have been cited because they were within FAA proper use guidelines. If FAA guidelines change, it may be that the acceptable elevations change along with them.

It is not clear whether or how the courts may view the ability of drones to operate safely and within FAA guidelines at lower elevations and how that might impact searches. If aerial surveillance is allowable from any height the FAA deems safe, then lower-elevation drone surveillance may be used in place of manned-helicopter surveillance. This could potentially lead to more effective, but also more invasive, aerial searches, if the decrease in elevation translates to more detailed imaging.

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<sup>14</sup> Per *People v. Ramey*, "'exigent circumstances' means an emergency situation requiring swift action to prevent imminent danger to life or serious damage to property, or to forestall the imminent escape of a suspect or destruction of evidence."

<sup>15</sup> *California v. Ciraolo* (1986) specified that unwarranted aerial surveillance from an altitude of 1,000 feet is reasonable. *Florida v. Riley* (1989) similarly allowed unwarranted aerial surveillance, but from the lower altitude of 400 feet.

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Another consideration is that current manned aerial surveillance efforts are typically limited to primarily overhead views due to the combination of topography and minimum safe flying elevations, but a relatively small drone would potentially be able to fly (or hover) at an elevation parallel to windows above the ground floor. This may lead to law enforcement officials being able to capture images from viewpoints they cannot currently easily get to. However, it is not clear that capturing images from this vantage point would require a warrant now. It is possible that evidence collected from that viewpoint would be admissible without a warrant in certain situations (e.g., for looking over fences or shrubs into the backyard) but not for others, depending largely on whether that viewpoint was deemed publicly accessible or not.

**Reasonable expectation of privacy and sense-enhancing devices.** Beyond “human eye” aerial surveillance, the use of technology to aid or alter what and how much can be seen from an allowable vantage point has generally not been ruled as admissible evidence. In *Kyllo v. United States* (2001), the U.S. Supreme Court ruled 5-4 that heat-sensing imaging that allowed law enforcement to effectively see certain aspects of the inside of a private home amounted to a violation of an individual’s expectation of privacy and thus was deemed an unreasonable search that is not allowable without a warrant. The other notable feature of this ruling was that the expectation of privacy had been violated not only because the technology was looking into the house through the very features the individual relied on to provide privacy (e.g., walls, roofs, or curtains), but also because the technology employed to perform the search (infrared imaging sensors) was not publicly available and/or commonly used among the public.

**Implications of current warrant law on drone use.** Both aspects of the *Kyllo* decision have potential ramifications for use of drones. Most plainly, drones can potentially be equipped with infrared technology (or other types of sensors that reveal something about the content of a home) and doing so would be an unreasonable search given current case law precedent. However, as one factor of the ruling deals with the public use of technology, it may be that eventually infrared technology (or other sensors that can give someone an image of what happens within a building) becomes so publicly pervasive that using it to look inside a house is no longer determined to be a violation of the expectation of privacy.

This factor could impact drone use; while drones may not be commonly flown just yet, their increased functions and affordability may lead to such common use that the judicial view of the expectation of privacy may conform to acknowledging the presence of drones. In particular, this is a possibility with decreasing the expectation of privacy in areas that are currently not viewable from non-aerial public viewpoints (e.g., upper story windows not near other buildings) or areas that may be shielded from overhead aerial views by overhangs. This change in the interpretation of what is a reasonable expectation of privacy is not assured to happen and may be avoided without any state action, but it does remain a possibility that should be considered as drone use increases and drone laws are developed.

### Other State Laws Summary

Within the last two years, 20 states have passed legislation directly dealing with drones.<sup>16</sup> Almost all states have considered some legislative action regarding drones.<sup>17</sup> Program review staff examined these laws in other states in order to determine what aspects of drone use have been regulated under state law elsewhere, examine the concerns about drone use and drone regulation raised and addressed in other states, and decide whether the regulatory efforts put in place in other states would be appropriate to adopt in Connecticut.

Besides looking at the laws themselves, program review staff considered the testimony and media accounts associated with the legislative actions in other states. The concerns expressed elsewhere mirrored the main concerns brought up by stakeholders in Connecticut – privacy, safety, and economics were the most frequently cited issues. Most of the legislative proposals adopted dealt with trying to find the proper balance between safety and privacy. Since the concerns elsewhere were largely the same as in Connecticut, it follows that Connecticut’s efforts at drone regulation may benefit from identifying the basic goals of laws written and adopted elsewhere.

Ultimately, all of the laws were passed so recently that no determination of effectiveness was possible for this study. Faced with extremely limited objective data, no single state method was determined to be appropriate for direct emulation in Connecticut. However, the recommendations made in Chapters V and VI of this report are informed by pieces of legislation passed or raised elsewhere, as well as by academic and stakeholder reaction to the same.

### State Regulatory Drone Laws

In total, 20 states have adopted drone-related laws other than resolutions. However, no conclusions can be drawn directly from the number of states that have passed laws, as the issue is recent enough that nearly all legislative action has been adopted within the previous two calendar years. It is probable that more states will pass legislation in the next few years, although some states may intend to wait for more information on federal regulation before addressing the issue at the state level.

Of the 20 states that have adopted legislation, 15 states have passed laws attempting to regulate drone use in some way. Of those 15, all but one have limited law enforcement use in some manner. The other five states that have passed drone laws have done so to fund drone test sites, drone research, or both. This section focuses on those state laws that regulate drone use. Table IV-1 summarizes all current state regulatory drone legislation.

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<sup>16</sup> This number does not include states passing just resolutions about drones.

<sup>17</sup> Forty-six states have considered at least one drone-related bill according to data from the National Conference of State Legislators (NCSL).

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**Table IV-1. Summary of Regulatory Drone Legislation Adopted in Other States.**

State	Bill Number	Chapter	Year	Moratorium	Criminal Penalty	Civil Remedy	Law Enforcement Restriction
Alaska	HB 255	Chapter 105	2014				Yes
Florida	SB 92	Chapter 2013-33	2013				Yes
Idaho	SB 1134	Chapter 328	2013			Yes	Yes
Illinois	SB 1587/1652*	Chapter(s) 569/402	2013		Yes	Yes	Yes
Indiana	HB 1009	Chapter 170	2014		Yes		Yes
Iowa	HF 2289	Chapter 1111	2013		pending report		Yes
Louisiana	HB 1029	Chapter 661	2014		Yes		No
Montana	SB 196	Chapter 377	2013				Yes
North Carolina	SB 402/744	Chapter(s) 2013-360/2014-100	2013/2014	Yes	Yes	Yes	Yes
Oregon	HB 2710	Chapter 686	2013		Yes	Yes	Yes
Tennessee	SB 796/1777/1892	Chapter 470/629 /876	2013		Yes		Yes
Texas	HB 912	Chapter 1390	2013		Yes		Yes
Utah	SB 167	Chapter 399	2014				Yes
Virginia	HB 2012/SB 1331	Chapter 755/796	2013	Yes			Yes
Wisconsin	SB 196	Chapter 213	2013		Yes		Yes
*Illinois also passed SB 2937, which amended existing drone law to account for use of third party drone-based data. Source: NCSL data and PRI analysis							

**Moratoriums on governmental use of drones.** To date, only two states, North Carolina and Virginia, have enacted moratoriums on some aspect of governmental drone use, though exceptions to the moratorium are allowed in each state. Virginia’s moratorium applies only to agencies “having jurisdiction over criminal law enforcement or regulatory violations” but allows for drones to be used by those agencies in response to certain emergencies, including search and rescue operation. Virginia’s moratorium, established in 2013, is scheduled to expire in mid-2015.

North Carolina passed a wider-ranging moratorium on all governmental drone use, but allows uses that are approved by the state’s Chief Information Officer on a case by case basis. North Carolina’s moratorium was scheduled to expire in summer of 2015, but was extended through the end of 2015 as part of a larger legislative effort in 2014 that restricted both governmental and non-governmental uses of drones.

## Law Enforcement Drone-Use Restrictions

Thirteen states have passed non-lapsing restrictions on law-enforcement use of drones.<sup>18</sup> All 13 have used a regulatory framework that included blanket prohibitions on law enforcement or governmental use of drones, but all include exceptions that then allow drone use in cases when the drone is operated under the conditions of a warrant or to address an emergency. Emergency use is specified to include search and rescue activities and instances where there is reasonable belief that there is an imminent threat to life or safety, but can also include situations that allow for surveying natural disasters or pursuing a suspect while a crime is in progress. Five states have also specified that drones can be used to address specific terrorist threats, though this iterated allowance is duplicative of the more general emergency allowances. Beyond these core exceptions, there is a lot of variation.

**Allowing use when a warrant is not required.** Five states (Alaska, Iowa, Montana, Utah, and Wisconsin) have exceptions that allow for law-enforcement drone use either with a warrant or in situations where a warrant would not normally be required. Without other restrictions, this type of drone regulation is simply codifying that drones can only be used within existing law and judicial precedent.

**Crime scene documentation.** Three states (Illinois, Texas, and Oregon) specifically allow drones to be used as a method of crime scene documentation. Including the five states that generally allow use outside of warrants brings the total that allow this type of activity to eight of the 13 states with law enforcement restrictions. Program review staff found no evidence of objection to use of drones for crime scene documentation in any of the states examined. Because of this, it is more likely that states overlooked this potentially beneficial, non-objectionable use when crafting legislation than that these states meant to specifically restrict this type of use.

**Data restrictions.** Drone use regulations in six states have included sections that clarify data storage and admissibility rules. The laws in Florida and Iowa state that the information collected with a drone is inadmissible unless obtained under the terms of a warrant. Montana and Alaska place similar restrictions, but allows for the admissibility of all data obtained under the broader terms of their drone laws. Since both of these states are generally permissive of use outside of a warrant, this means almost all drone-collected data is admissible.

Utah is generally permissive of law-enforcement drone use and addresses data-retention, but does so in such a permissive way that the restrictions seem, to program review staff, ineffective or unnecessary. The Utah law also specifies that data collected with a drone, but not by law enforcement agents, is allowable and should be considered admissible by the courts. Illinois has a data-retention policy that requires drone-based data to be destroyed within 30 days of collection unless there is a reasonable suspicion that data includes information regarding criminal activity.

**Reporting requirements.** Though not a direct restriction on drone use, reporting requirements can help inform policymakers and the public as to the types and frequency of drone

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<sup>18</sup> The 13 includes North Carolina, as that state has passed laws that extend beyond the moratorium, but excludes Virginia, which so far has only passed the moratorium.

uses by governmental entities. Four states (Illinois, Oregon, Texas, and Utah) require that drone ownership or use be reported on a regular basis. Illinois requires annual reporting on the number of drones owned by any governmental entity. Additionally, Illinois is one of two states (Oregon is the other) that requires emergency use of drones (i.e., drone use outside of warrants and/or criminal investigations) to be reported within 24 to 48 hours of the emergency use. Oregon and Utah require annual reporting of actual drone use, though Utah allows use related to ongoing investigations to be temporarily omitted and reported the following year. Texas requires law enforcement agencies to report drone use in odd-numbered years if the jurisdiction of the agency (local, county, or state) exceeds a population of 150,000 people.

To date, only Illinois has reached a reporting milestone. The first annual report on the number of drones owned shows that three drones are owned by governmental agencies in that state. (The Illinois report can be found in Appendix A.)

**Other notable law-enforcement restrictions.** While many features of current state drone law are common to multiple states, there are several interesting portions, clauses, or features that are only currently found in a single state's law. Wisconsin law includes a definition of drones that sometimes limits their classification as drones to those instances where the drones are recording images or sounds.

Indiana specifies that drones are defined as tracking devices. Given that use of tracking devices, especially in instances of ongoing surveillance, was recently restricted by the Supreme Court in the decision of *United States v. Jones* (2012), the Indiana law does meaningfully restrict law enforcement drone use for surveillance activities. Indiana also specifically allows drones to be used for the purposes of geographical survey, outside of criminal investigations.

Idaho drone law is relatively restrictive. Drone use by law enforcement is limited to cases where the use is done under the terms of a warrant or in the case of an emergency, except the use of drones for "marijuana eradication efforts" is also specifically allowed. Current aerial surveillance is often focused on finding where controlled substances are grown, so this allowance is fairly large. Still, limiting unwarranted drone surveillance to just operations involving marijuana seems to unnecessarily leave out operations where other controlled substances may be present.

### **Criminalization of Drone Use**

A few states have passed laws criminalizing some aspect of drone use. As of this writing, nine states have described drone uses that are specifically prohibited and one more, Iowa, passed a law looking into the need for criminal sanctions for certain types of use. Of the nine states that have adopted drone-specific criminal sanctions, eight have also passed law enforcement drone restrictions of some kind. The ninth state, Louisiana, prohibits pointing lasers at a drone or using a drone for targeted surveillance of select types of facilities (i.e., petroleum and alumina refineries, chemical and rubber manufacturing facilities, and nuclear power electric generation facilities) without consent, but has not passed legislation specific to governmental or law-enforcement use.

Four states (Indiana, North Carolina, Tennessee, and Texas) have prohibited some aspects of drone-based photography or videography, though each state's law provides exceptions for images of videos taken with the consent of the person or property owner involved. North Carolina has made an exception to its photography ban for journalists. In some cases, the photography is permitted when the persons or property being photographed is not identifiable. Additionally, some state laws specify that publishing the pictures (i.e., either posting them publicly on the internet or selling them privately) is a greater crime than possessing the pictures. In these instances, criminal charges may be avoided if the pictures are destroyed without publishing upon discovery that a person or private property was identifiable within the images.

Wisconsin has banned the weaponization of drones (i.e., equipping any drone with a weapon that can be deployed or operated remotely). Illinois passed a law that prohibits hunter interference with a drone, which also includes some potential civil penalties for the same.

Oregon, among others, has passed a drone-related criminal law that serves to protect drones, rather than protect people from drones. In particular, shooting at drones or interfering with their operation without consent, either by taking over the drone through hacking the remote connection or by pointing lasers at a drone, which might cause sensor malfunction, are both illegal.<sup>19</sup>

### **Civil Remedies for Unwanted Drone Use**

Beyond prohibiting certain governmental uses of drones and specifying criminal sanctions for other types of drone use, four states have provided civil remedies to address some unwanted aspect of drone use. As mentioned previously, Illinois adopted both criminal and civil consequences for drone use that interferes with legal hunting or fishing practices.

Oregon provides a civil course of action for drone operators to pursue if their legal drone use is interfered with, which mirrors the criminal sanctions that state put in place. Oregon also specifies that civil suit can be brought for the unwanted use of drones at less than 400 feet above a person's private property, if the property owner has warned the drone operator that the use is an unwelcome behavior at least once prior to the incident that sparks the civil suit.

Idaho also created a civil remedy that allows a person to bring suit against a drone operator if the drone operator is engaging in unwanted surveillance or otherwise photographing an individual in a private area without that person's consent. North Carolina has a similar law that allows civil suit to be brought against persons for unwanted surveillance, stating that the victims of unwanted surveillance may receive a sum of money for each unwanted image taken.

### **Drone Laws Under Consideration**

Besides those states that have passed regulatory drone laws, program review staff, with the assistance of the Office of Legislative Research and the Legislative Commissioner's Office, examined information on bills that were considered in other states. In total, drone-related laws that were passed or proposed in 34 states were analyzed.

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<sup>19</sup> Louisiana's drone law similarly prohibits use of a laser to interfere with a drone.

The aim of this analysis was to determine if a wider range of possible regulations had been considered beyond just those legislative efforts that had been successfully adopted. Staff also examined whether the issues and possible legislative fixes considered but not adopted had differed in any substantial way from the regulatory efforts that were adopted. The results indicate that the same concern areas, privacy and safety, were present in reviewed states, regardless of whether legislation had been passed. Likewise, almost all states reviewed for this study have considered or passed legislation that restricts law-enforcement use of drones in some manner, and over half of all states reviewed considered or adopted legislation that criminalizes some aspect of drone use.

Table IV-2 provides a summary of the legislation considered in 19 of the 34 states that have not adopted regulatory legislation, which includes looking at what else the five states that passed non-regulatory test site or research funding considered. This sample represents just over half of the 34 states (excluding Connecticut) that have not adopted drone regulation legislation.

<b>Table IV-2. Types of legislation considered in states without regulatory drone legislation.</b>			
State	Non-regulatory bill adopted	Types of legislation introduced or considered	
		Law enforcement limitation	Criminalization of non-law enforcement use
Alabama	No	Yes	Yes
Arizona	No	Yes	No
Arkansas	No	Yes	Yes
California	No	Yes	Yes
Delaware	No	No	No
Hawaii	Yes	Yes	Yes
Kansas	No	Yes	No
Maryland	Yes	Yes	Yes
Minnesota	No	Yes	Yes
Missouri	No	Yes	No
Nebraska	No	Yes	No
Nevada	Yes	No	No
New Hampshire	No	Yes	Yes
New Jersey	No	Yes	Yes
New Mexico	No	Yes	No
New York	No	Yes	Yes
North Dakota	Yes	Yes	No
Ohio	Yes	Yes	No
Washington	No	Yes	Yes
Number and Percent of Sample	5 of 19 (26%)	17 of 19 (89%)	10 of 19 (53%)
Source: NCSL data and PRI, OLR, and LCO analysis			

### State Options to Regulate Non-governmental Drone Use

Some drone use outside of government agency use may be regulated by the state, though certain efforts may run into federal preemption issues. This chapter examines some non-government agency drone uses and identifies areas where state action may be necessary, including some regulatory paths that might impact both governmental and non-governmental uses. In particular, this chapter provides information in several areas: review of existing statutes, drone registration, criminal use of drones, civil remedies for commercial drone use, and the economic impact of drones.

#### Statute Review

As discussed in Chapter III, current Connecticut statutes were crafted without the capabilities, and availability, of drones in mind. Because they do not need to be able to carry the weight of a pilot, drones are available at much smaller sizes and weights than manned aircraft. It is this smaller size that allows them greater maneuverability and safer operation at lower elevations. However, some drones are as big or as heavy as existing manned aircraft. As it is the smaller craft that are expected to be most prominently used going forward, and that the new features and capabilities of those craft that are most likely to exist outside the expectations of current statute for all aircraft, **the program review committee recommends:**

- 1. The statutory definition of “aircraft” in C.G.S. Sec. 15-34 (5) shall be amended to indicate that the term includes both manned aircraft and unmanned aircraft. Definitions of both manned and unmanned aircraft shall be adopted within statute, to allow proper differentiation when the term “aircraft” is found to be overly broad. Also, a subset of unmanned aircraft shall be defined as “small unmanned aircraft” when such unmanned aircraft weigh less than 55 pounds.**

Creating these new categories under the umbrella term “aircraft” should assist lawmakers to modernize existing statutes to explicitly consider unmanned aircraft and small unmanned aircraft. The demarcation of small unmanned aircraft is intended to follow the federal definition of this class of unmanned aircraft. While the federal regulations for small drones have not yet been made public, it is likely that these small craft will be regulated in a substantially different manner than heavier drones.

There has been suggestion by some drone users interviewed by committee staff that the 55-pound weight limit maximum used at the federal level is too heavy to maintain safety adequately. The legislature may eventually need to identify another subset of small drones that is significantly lighter or smaller. However, until there are more drones on the market in the 20 to 55-pound weight range or until federal small unmanned aircraft regulations are adopted, it would be easiest to use the federal 55-pound weight limit to define small unmanned aircraft in Connecticut.

Though current statutes do not directly refer to drones, there are instances where drone use seems to be covered under existing state statute, especially for statutes pertaining to aircraft more generally. Chapter 266 on Aeronautics dates back to at least the 1949 statute revisions, and it is possible that much of it is preempted by federal law. Other statutes have been made obsolete through a combination of changes in aviation technology and reorganization of state government (e.g., the creation of the Connecticut Airport Authority, the Connecticut Department of Transportation no longer has an aviation unit, current statutes still require the transportation commissioner to oversee certain aeronautic rules and regulations which may be more appropriately administered by CAA). As many of the aeronautic statutes are outdated, **the program review committee recommends:**

- 2. The Connecticut Law Revision Commission shall review all state aircraft- and aeronautic-related statutes. The review shall include a determination of whether the statutes continue to be useful to the state, particularly for safety, privacy, or financial reasons. The review shall also determine when and if certain statutes should pertain only to a subset of aircraft, such as manned aircraft or small unmanned aircraft. The review should prioritize repealing statutes that are preempted by federal authority.**

## **Registration of Drones**

Notwithstanding the federal preemption issues and outdated aircraft statutes, the state currently has some limited authority regarding non-governmental manned aircraft. The state should expect a similar level of authority over non-governmental unmanned aircraft, except, perhaps, for those activities, capabilities, or uses of unmanned craft that differ from their manned counterparts.

One area of continuing state authority is of registration of aircraft for the purposes of property assessment and taxation.<sup>20</sup> In order to avoid federal preemption, state registration requirements should not be used to prevent the operation of the aircraft. One state, North Carolina, recently passed legislation mandating state registration of drones beyond anticipated federal registration requirements. As the federal registration requirements for drones have not yet been adopted, it is not yet known whether the North Carolina law will need to be adjusted to avoid clashes with federal authority.

There may be a financial incentive for a state to require state registration of drones, as registration fees and property taxes on drones are potentially new sources of revenue. Indeed, Connecticut has some governmental infrastructure in place to register manned aircraft at the local level. However, since drone ownership is expected to eventually be far more common than manned aircraft, it may be that current local resources dedicated to manned aircraft registration would be overwhelmed by the volume of drone registrations. Further, building more infrastructure to register and tax drones universally might result in greater costs than individual

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<sup>20</sup> Administration of the state's aircraft registration program is done by CAA, per C.G.S. Sec. 15-120cc. (31).

revenues. Registration requirements in addition to the anticipated federal one could stifle drone use adoption in the state and, with it, any economic benefit from expanded drone use.

Any benefits from adopting and enforcing a drone registration requirement in the state before the federal program is in place are likely to be outweighed by the costs of the registration program, which might include altering the system to align with the federal registration system or defending the legal status of the state registration program. The information gathered in the registration process at the federal level should be both the same basic information the state might seek about a registered drone and available to the state for review when necessary.

Once federal registration requirements for certain drone weight classes are made available, Connecticut should explore whether instituting a non-government agency drone registration program makes sense to achieve state safety and privacy goals, as well as whether such a program might be a long-term net positive revenue source. As part of this future examination, the state should determine whether drones in low weight classes, such as the small unmanned aircraft definition recommended above, should be exempted from registration requirements. To clarify the intent of this course of action, **the program review committee recommends:**

- 3. Unmanned aircraft shall be exempt from the aircraft registration requirements of C.G.S. Secs. 13b-39a to 13b-39d inclusive for a period of ten years.**

Adding an exemption with a limited duration should allow policymakers time to observe adoption trends, examine federal regulations as they are adopted, and give the local governmental officials, who would be required to administer such registration programs under current law, time to prepare for the added time and expenses that may be incurred as drone use increases.

### **Criminal Use of Drones and State Response**

Outside drone operation, which is addressed federally, criminal use of drones can occur when used to perform activities that are illegal. That is, it is possible that a person using a drone could be committing a crime, but at the state level that crime would not be for drone use generally, but rather what is being done via the drone. The situation gets more complicated, and may require legislative action, when the statutorily-defined elements of the crime inadvertently exclude the possible use of drones.<sup>21</sup>

**Stalking and voyeurism.** One of the greatest concerns brought up in this study is the potential use of drones by private individuals to invade other individuals' privacy. There are numerous ways this general activity has been addressed statutorily, especially laws to prevent stalking and voyeurism. As described in Chapter III, using a drone to stalk seems to be addressed by current statute without modification. This is mostly true for the voyeurism statute as well. It is worth pointing out, however, that the meaning and enforcement of some statutes may eventually be directly or indirectly impacted by drone use.

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<sup>21</sup> This inadvertent exclusion of drones seems to occur when the capabilities of lightweight, maneuverable unmanned aircraft were not contemplated at the time the criminal act was described statutorily.

Current voyeurism law includes definitional language stipulating that the offending filming or photography is made “while (the victim) is not in plain view” and “under circumstances where (the victim) has a reasonable expectation of privacy.”<sup>22</sup> While not assured to do so, increasing drone use may change the underlying interpretation of what is deemed to be “in plain view” or what a “reasonable expectation of privacy” is in some circumstances. Even if this happens, it is likely that most use of drones for unwanted surveillance that captures images inside a house or otherwise on private property may be considered criminal conduct under existing law. It may be that pending FAA drone regulations directly or indirectly address this issue.

After federal regulations are adopted, current state law or federal regulation could be examined to determine if drone-based voyeurism, along with similar laws like stalking, is addressed adequately. If current law does not adequately address these uses, policymakers should consider adopting legislation that prevents this method of capturing unwanted images or video in a way that is inclusive of all technologies. Rather than specifying that drone-based voyeurism is indeed voyeurism, drones should be held as just one example in the category of technology the use of which is not inherently voyeuristic or otherwise criminal, but nevertheless may be used as part of a criminal activity. **The program review committee recommends:**

- 4. The term “in plain view” as used in C.G.S. Sec. 53a-189a shall be defined to exclude any view obtained through the use of technology, including drones.**

**Criminal trespass.** Under current law, the presence of a drone itself is unlikely to be considered trespassing, because trespass requires a person to be on the property. It may be possible to modify the existing trespass law to state that trespass can be committed by a person or a technological proxy for a person, but that may be overly complicated and contested. Further, for trespass law to be effective outside of a building or house, it would need to be clear how far up personal property extends. That is, a drone would only be trespassing if it is *on* a property, not if it is flying above that property. As stated in Chapter III, current law, state or federal, does not provide a specific elevation end point for property rights.

The state would likely need to adopt a specific height relative to the ground below, a height above the highest structures on a piece of land, or some other demarcation for aerial trespass laws to be effective. This is somewhat problematic, as while this may be legally possible, it is not clear the state has the specific authority to establish aerial property rights in a clear and easy way. Under FAA’s current interpretation of its authority, all airspace is under that agency’s jurisdiction, including the airspace immediately above private property. If a state tried to establish a private property elevation, the state would likely be the subject of legal challenges from the FAA. As there are numerous other ways to deter or prevent unwanted drone use around private property, program review staff makes no recommendation to change trespass law or establish a personal property height at this time.

**Weaponization of drones.** There is some concern that drones can be used to remotely control weapons to intentionally harm persons or property with a drone. In the course of this

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<sup>22</sup> C.G.S. Sec. 53a-189a.

study, the risks and dangers of drones being used to control weapons were deemed by stakeholders to far outweigh any potential benefits of allowing the public such a practice. Considering these aspects, **the program review committee recommends:**

**5. Remote operation, including through the use of drones, of deadly or dangerous weapons shall be prohibited.**

As mentioned in Chapter III, while current law prohibits the possession of certain weapons, the presence of such a weapon on a drone may not be presumptive evidence of possession given the statutory definitions involved. For these reasons, **the program review committee recommends:**

**6. The presence of restricted items (e.g., weapons or controlled substances) on, in, or otherwise attached to unmanned aircraft shall be presumptive evidence of the possession of said items by the unmanned aircraft operator.**

### **Civil Remedies for Dealing with Unwanted Non-governmental Drone Use**

As discussed in Chapter III, states can also establish civil remedies to help private citizens deter or prevent unwanted drone use on or near their personal property. While current law may be inclusive of civil action regarding drones, providing clarification about the applicability of current civil remedies for incidents involving drone use may at least partially address some privacy concerns. An advantage of establishing guidelines for civil action regarding drones, rather than more specific criminal language, is that these should not unnecessarily prevent or discourage private drone uses on a person's own property or with the consent of other property owners.

Given the wording of existing law and the ambiguity associated with the lack of federal regulations, these clarifications may not be necessary at this time. However, if policymakers eventually decide to explicitly include civil drone offenses, such clarifications should be inclusive of drones as one form of technology among several to which these civil rules apply. If written correctly (i.e., avoid setting specific height requirements or forbidding uses the FAA specifically allows), this type of clarification should avoid federal preemption while providing additional avenues for remedy of potential privacy invasions.

### **Commercial Drone Use**

Use of drones by non-governmental agencies for commercial activities is regulated by the federal government through FAA authority. While there is currently a blanket prohibition on commercial drone use, except for certain special uses, that commercial ban is not expected to last indefinitely.<sup>23</sup> As of this writing, the FAA has stated that the first commercial drone regulations should be made available for public comment in late 2014 or early 2015. The first required draft commercial regulations are expected to be limited to small drones with regulations on larger

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<sup>23</sup> A very limited number of commercial uses of drones have been allowed to date. In late September 2014, the FAA announced that six film making companies had been approved to use drones on closed sets for commercial activity. These waivers joined two previous commercial use approvals that were limited to rural Alaskan locations.

drones coming out in stages in the years following.<sup>24</sup> It is likely that even the earliest commercial regulations will not be adopted until at least 2016.

Not knowing what the federal regulations might include, state legislation crafted now might conflict with these impending FAA regulations. Further, numerous stakeholders and stakeholder groups in Connecticut have expressed their desire to use drones for commercial purposes and to do so without state limitations beyond the expected FAA requirements.

Some drone-related legislation in other states (e.g., Texas and North Carolina) includes provisions that attempt to clarify what commercial uses are allowed. But commercial drone use in those states continues to be prohibited under federal law, regardless of whatever laws the state has passed. Commercial drone activity is expected to continue to be regulated federally in the future, so passing state laws allowing or prohibiting certain commercial uses may confuse users. This, in turn, could lead to FAA enforcement actions against those state resident drone users, while putting the state in a position to face legal challenges from the federal government.

Other states have passed laws restricting certain commercial uses, most commonly prohibiting the capture and distribution of certain images produced with the assistance of a drone. In some cases, these laws, like FAA rules, distinguish between commercial use and private use. Such laws seem overly difficult to enforce, as determining whether a drone is being used for recreation or commercial activity is difficult at the time of the activity and may change at time after the actual drone use (e.g., a hobbyist takes pictures with a drone and later decides to sell an image).

Within the context of state regulation of drones, any restrictions on non-governmental drone use should focus on improving the two main drone-related concern areas of safety and privacy. Based on staff interviews and literature review, there appears to be consensus between various stakeholder groups that any restrictions on non-governmental use of drones should be neutral to the type of drone user (i.e., commercial or hobbyist). Therefore, **the program review committee recommends:**

**7. No laws specific just to commercial drone activity should be adopted in the state until at least such time as relevant federal unmanned aircraft regulations are adopted and can be reviewed.**

Instead, any action restricting non-governmental drones the legislature deems necessary to protect resident privacy and safety should be content-neutral. This means that any law on drone use should address either all drone use or all non-governmental drone use, regardless of whether the use directly or indirectly leads to money changing hands. For instance, the state eventually may choose to restrict the launching, landing, or operation of drones in the direct proximity of active crime scenes to maintain integrity of the scene and alleviate the possibility of a drone crash in a sensitive area.<sup>25</sup> If a restriction like this were adopted by the state, it should apply to private citizens and journalists alike, and not just one group or the other.

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<sup>24</sup> In this context, small drones are expected to be defined federally as drones weighing less than 55 pounds.

<sup>25</sup> This example is not a specific recommendation, as issues like this one may be addressed by federal regulation and may also be complicated by current law surrounding photography of crime scenes more generally.

## Potential Economic Impact of the Drone Industry

Another issue that was brought up by stakeholders regarding drone use is the expected economic impact of the emerging industry - and whether and for whom the impact will be positive or negative. Unfortunately, there has been little work done in this area by neutral, outside observers – the limited information readily available is industry-sponsored research. Accounting for that concern, the overall economic possibilities seem impressive. In one report, the impact of drones is estimated to be over \$13 billion nationally in the first three years after drones are integrated into the national airspace.<sup>26</sup> However, since the FAA regulations necessary to integrate drones into the national airspace have not been adopted, any sizeable impact has yet to be felt. Similarly, the same report estimates that with each year that passes without full drone integration in the national airspace, up to \$10 billion is prevented from entering the national economy.

Faced with the massive uncertainty of the real impact of a relatively new technology, there are no surefire options to boost drone-related economic activity through state legislation. On the other hand, if drones are expected to provide a net positive economic impact, states may want to be careful to not impede such a boost through slowing the adoption of technology, particularly through creating additional regulations that may be viewed as cumbersome or unnecessary without added benefit to safety or privacy.

A few other states have adopted resolutions regarding the importance and potential economic benefits of expanded drone use. In some cases, these resolutions were crafted as a way of proactively reaching out to the drone industry to encourage creation of drone-related economic activity in the state. Other resolutions have more directly called for swifter federal action to allow some aspect of drone use or have urged favorable consideration of that state for the location of a drone test site. The nascent nature of the drone industry prevents any meaningful analysis of the impact of such resolutions. But, passing a resolution to encourage FAA timeliness in adoption of regulations that would allow the creation of legal drone uses in the state might be a worthwhile action with little downside.

**Drone test sites.** At this time, there are active drone test sites authorized by the FAA located in six different states – Alaska, Nevada, New York, North Dakota, Texas, and Virginia. These sites were selected from 25 different proposals in 24 states. It is not yet known if the FAA will eventually expand the number of drone test sites nationwide. If it does, it may be in Connecticut’s financial interest to provide some funding for a site for use by drone manufacturers in and out of the state. Otherwise, the state may want to explore developing a formal relationship with the current site nearest to Connecticut geographically, in New York.

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<sup>26</sup> Jenkins, Darryl and Bijan Vasigh. *The Economic Impact of Unmanned Aircraft Systems Integration in the United States*. March 2013.



### State Options to Regulate Governmental Drone Use

States maintain the authority to regulate what state and local government agencies can and cannot do, beyond certain federal minimums, with regard to drones. States can look to FAA guidelines for non-governmental aircraft to establish minimum safety standards, but states may also choose to be more restrictive of governmental drone use than federal regulation dictates for non-governmental drone use without running into issues of federal preemption. The ability to self-direct state and local government agencies opens a wide range of regulatory options to deal with at least some drones while balancing safety and privacy concerns. This chapter outlines several regulatory options - some as comprehensive systems and others as standalone pieces of a regulatory program - and presents committee staff recommendations for legislative consideration.

#### Governmental Drone Use Regulatory Framework Options

Several regulatory framework options are discussed that address different aspects of drone-related concerns. In particular, there are two extreme options worthy of consideration, as well as several more moderate regulatory paths. While the options are presented as discrete choices, in some cases there are different ways to blend several of the presented options together. Likewise, there are many permutations of these and other policies that might also address the underlying balance of privacy and safety concerns.

All of the options have potential advantages and disadvantages that are inherent in trying to balance the safety and privacy of Connecticut residents. Some regulatory efforts immediately provide specific legislative direction to potential governmental drone users, sometimes at the cost of future flexibility – an important consideration when dealing with emerging and evolving technologies. Some of the most decisive efforts may run afoul of federal regulations or upset local drone stakeholders.

#### OPTION 1: NO LEGISLATIVE ACTION

The possible results of indefinitely not taking legislative action on drones are outlined in Chapter III: that chapter describes current law and how drones may fit into it. However, many of the results from this option rely on waiting for judicial precedent to be set and sorted out, which is likely to take many years, and those court rulings may be unpredictable in both the nature and scope of each ruling.

**Advantages.** No legislative effort is required. Law enforcement agencies will be free to deploy drones as they see fit to maximize public safety, within the bounds of current search warrant requirements.

**Disadvantages.** Concerns about possible infringement or degradation of fourth amendment privacy rights are not addressed. Unless affirmative action is taken by the legislature,

it may not be clear to law enforcement officials whether no change to current law was deemed necessary or if a law change is pending, but not yet agreed upon.

**Conclusion.** This option is desirable if policymakers believe that present law that allows aerial surveillance and currently prevents law enforcement use of certain new imaging technologies is all properly applicable to drones and/or the imaging devices used on drones. This option represents a continuation of the status quo. While this option is not sufficient to address some privacy concerns, it may be a worthwhile temporary option if policymakers prefer to wait to take action until FAA regulations are adopted and there is some evidence of common use of drones by law enforcement agencies in Connecticut. The 35 states that have yet to pass regulatory drone legislation, including Connecticut, are currently using this option, though reliance on this option may be temporary while other options are being considered.

## **OPTION 2: MORATORIUM ON GOVERNMENTAL DRONE USE**

This option would have the legislature prohibit all governmental use of drones, regardless of purpose or agency. A couple of variations of this option include barring governmental ownership, but allowing limited arrangements where drones are used in emergencies, or barring only law enforcement use of drones while allowing drone use in other governmental agencies.

**Advantages.** Not allowing any governmental use of drones is perhaps the cleanest of all options, as there is no ambiguity about what drones can be used for, where they can be used, and by whom. In this case, privacy concerns are exactly where they have been without drones as a law enforcement option.

**Disadvantages.** As discussed throughout this report, there are many potential beneficial uses of drones for governmental work. Even within just law enforcement agencies, a blanket moratorium would prevent search and rescue or emergency response drone uses. Additionally, this would prevent government agencies from being able to provide a positive model of how drones can be flown safely.

**Conclusion.** While privacy advocates may appreciate the full stop to any drone-related encroachment of fourth amendment rights, no stakeholders expressed a desire to prevent all government (or just law enforcement) use of drones, because of the potential positive uses. This option could be used temporarily to halt any drone use while waiting for more information about federal regulations and fourth amendment case law. However, this option does not seem necessary in this state as there has been no law enforcement ownership of drones to date (and only very limited use of drones in emergency situations). This option would also rely on other states to discover innovative governmental uses of drones and develop best practices in the field, regardless of the specific agency using drones. To date, two states have relied on this option, though both states' moratoriums are scheduled to expire by the end of 2015.

### **OPTION 3: EXCEPTIONS TO A GENERAL PROHIBITION OF GOVERNMENTAL DRONE USE**

Under this option, all uses would be prohibited except those explicitly allowed. The major difference between this and a comprehensive moratorium is what exceptions are established. At a minimum, drone use in emergency and life-threatening situations are allowed, including use in search and rescue operations, as are law enforcement uses in criminal investigations with a valid search warrant. Another common exception is to allow training for governmental pilots and use.

**Advantages.** This option can be used to put in place restrictions that protect citizen privacy while allowing the most non-controversial law enforcement uses of drones outside of criminal investigations. Because the nature and type of exceptions are customizable, this option can be used to allow only those uses policymakers and stakeholders find most beneficial.

**Disadvantages.** Depending on the exceptions, this option prevents certain law enforcement drone uses, which may or may not be directly related to expectations of privacy. There is also the possibility that a somewhat restrictive set of rules for law enforcement use of drones serves to deter adoption of the technology within the law enforcement community, thus delaying the implementation of some of the beneficial uses (e.g., search and rescue).

**Conclusion.** As discussed in Chapter IV, this is the most common regulatory action taken by those states that have acted so far, but the differences in exceptions are important. Thirteen states have instituted some variation of this option. This option is particularly customizable, with the exceptions being the key to the effectiveness and balance between privacy and safety. Too many exceptions will water down the overall prohibition and with it some of the privacy protections. Too few exceptions may stifle innovative uses, even those outside of the realm of criminal investigations.

Five states have included broader exceptions that allow law enforcement use with a search warrant or in situations where a warrant is not normally required. Under provisions like these, the allowable uses where warrants are not required are so vast that this exception does not seem to prevent any expected uses. Instead, this larger exception has the effect of codifying the status quo, as examined in option 1. Eight states have adopted this option with more limited exceptions.

It may take several successive years of legislative observation and action to address the nature and types of exceptions to ensure the right balance between permissiveness and restriction is found. For instance, a few of the states that acted first used this option and included only fairly limited exceptions to the blanket prohibition. In the year or more since those actions, several other states have concluded there are some mostly non-controversial beneficial law enforcement uses outside of emergencies or areas where warrants are available – namely, in crime scene assessment and photography. Any legislative action to regulate drones may need finessing as federal regulations are revealed and use increases. However, without careful consideration, this option may unwittingly prevent beneficial uses, especially those outside of law enforcement criminal investigations (e.g., mapping of wildlife on state lands, or examination of transportation infrastructure).

## **OPTION 4: PROHIBITION OF SPECIFIC USES OF GOVERNMENTAL DRONES**

Under this option, restrictions would be placed on certain uses, but governmental uses would be allowed by default unless specified otherwise. For instance, if policymakers decide they would rather not have drones be used for traffic enforcement (or even a subset of traffic enforcement such as misdemeanor moving violations), that type of activity could be prohibited. Several states have employed this method specifically to restrict law enforcement drone activity surrounding hunting and fishing activities.

**Advantages.** Many of the fourth amendment concerns brought up by privacy advocates can be specifically addressed using this option. Drone uses that would not impact privacy concerns but may increase safety would be allowed, as would new or innovative uses.

**Disadvantages.** By allowing everything that is not covered by the specific prohibitions or by other laws or precedent, it is possible some controversial or less-desirable uses will be employed, either because they were not contemplated as possible uses during the crafting of the legislation or because they are unintentionally allowed because of the specifications of the prohibitions.

**Conclusion.** This option may be best suited to situations where there are a limited number of specific uses to be prohibited, as attempts to create a few broad restrictions or a greater number of focused restrictions may be overly burdensome. However, there is the potential with this option to address just the few uses that may be objectionable. For instance, if, in the end, the biggest privacy concern is about a pervasive use of drones for surveillance performed without a search warrant, this option could be used to address that concern and specifically restrict just surveillance activities while maintaining the availability of other uses. This option has been used by one state, Louisiana, for prohibiting criminal uses and for non-governmental drone-based surveillance of certain facilities, but has not yet been used elsewhere to regulate governmental drone use.

### **Regulation of Governmental Drones**

Given that there are many potential beneficial uses of drones by law enforcement or other governmental agencies, there does not appear to be a need to institute a general moratorium on use, as was presented as Option 2. Likewise, taking no legislative action largely leaves the decision making on these issues to the judicial system. Adopting regulation through precedent via the judicial system will take considerable time and will be reactionary – only producing new law after a potential misuse is challenged. Additionally, the precedent of judicial rulings is focused on the specifics of a single case. There may not be clear information on how and when the precedent will be relevant in similar situations. Adoption of emerging technologies tends to increase at exponential rates. Therefore, it is expected that innovative new uses of drones will appear as overall use increases, and relying on the relatively slow, reactionary setting of judicial precedent, as is the case in option 1, should be ruled out as a preferred solution.

The framework of the options that remain are: option 3) broadly prohibiting drone use then allowing specific uses; or option 4) broadly allowing drone use and prohibiting specific uses. Both can address the perceived need for regulatory action to maintain an individual's

freedom from unreasonable search or seizure while allowing certain law enforcement efforts that should make those same individuals safer. However, a broad prohibition on drone use with exceptions would potentially stifle the development of new, potentially beneficial, uses that may not be specifically addressed within the exceptions. Also, the blanket prohibition approach seems to be slightly more prone to single out drones among other technologies with similar capabilities, though this could still happen with the more permissive regulatory option.

Program review concludes that the best option is to specifically prohibit those actions or uses that seem likely to tip the balance between privacy and safety past the point where most stakeholders feel the tradeoff of one for the other may be worthwhile.

## **Surveillance**

In this case, the biggest government-related privacy concerns are that drones, by virtue of a decreasing cost compared to manned aircraft, will enable expanded implementation of general surveillance, targeted surveillance without a search warrant, or both. As such, Connecticut's legislative efforts to regulate drones should focus on setting the boundaries for use of this technology for surveillance activities. **Therefore, the program review committee recommends:**

- 8. The use of drones by Connecticut law enforcement agencies for surveillance of a specific individual or a privately-held property is prohibited except with the person or property owner's consent or when the duration of such drone-based surveillance is limited to the following conditions:**

### **Drone-based surveillance of a specific individual or a privately-held property:**

- c) with reasonable suspicion of criminal activity, but without the combination of probable cause and a valid warrant, shall be limited to 24 hours total cumulative duration within a 30-day time period; and**
- d) with probable cause and a valid warrant, shall be limited to the terms of the warrant.**

**A person or privately-held property shall not be considered the target of such surveillance unless the person or property is identifiable via the drone's imaging or other information-gathering device or is otherwise acknowledged as the intended target of such surveillance.**

This limitation on the duration of surveillance should mitigate the concern, perceived or real, of drones eventually being used to provide near-constant, unwarranted tracking of individuals. The exceptions for surveillance with the person or property owner's consent and the clarification of what constitutes surveillance of a specific target are specifically included to allow police surveillance of large public gatherings, such as outdoor concerts or sporting events.

Ordinarily, limiting such a policy to just one type of technology (i.e., drones) violates any broader goal of adopting technology-neutral laws, if such a goal is in place. However, drones are an unfamiliar emerging technology with unknown potential that are not clearly addressed under

current statutes. In this instance, it may be more appropriate and effective to address drone use specifically, rather than try to fit drones into a regulatory system that was created without the advantages and capabilities of drones in mind.

If such a surveillance policy is initially limited to drones, it can serve as a test to determine if this approach is worth exploring for the wider range of technologies. This approach to limiting unwarranted surveillance activity is supported by some academic research.<sup>27</sup> However, the implications of such a large policy change beyond drone use were not within the bounds of this study.

**Viewpoint of surveillance.** Another major concern about preserving fourth amendment expectations of privacy is raised because drones are capable of providing additional viewpoints not previously accessible to law enforcement agencies (or the public). Current aerial surveillance is generally limited to overhead views of private property. This overhead viewpoint is helpful to law enforcement for observing what is on the property other than roofed structures without skylights, but has not allowed unobstructed views of windows other than skylights.

Looking through a window under current law may or may not violate a reasonable expectation of privacy depending on the individual circumstance. For example, a first floor window immediately next to a public sidewalk provides little expectation of privacy, but a third floor window in a rural house set 100 yards back from the nearest public road has a greater expectation of privacy.

If desired, one way to ensure this new vantage point was not made available for law enforcement surveillance would be to establish minimum operating heights for governmental drones while collecting information. However, the potential for degradation of expectation of privacy here is rather limited because the expectation of privacy regarding upper-story windows in urban settings is already very low, and because this potential invasion of privacy can be addressed by the individual relatively inexpensively through the use of common window-blocking methods (i.e., blinds or curtains). Moreover, looking through the windows of a private dwelling would certainly fall within the targeted surveillance described previously, so adoption of that recommendation should also serve to significantly limit unwarranted observation from even this newly accessible vantage point.

The space that drones make more accessible is a relatively narrow range of elevation, which also changes with the distance from the window. The frequency with which drones might be present in this narrow area that provides this new view into a window is not known, in part because drones are not extremely common just yet. For this reason, and because the FAA regulations here are still unknown, there is no need for an additional regulatory action in this specific area at this time. However, this issue may be worth revisiting in the future after the FAA regulations regarding drone use near the ground or near buildings are adopted or when government use, especially for observing private property, has increased.

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<sup>27</sup> McNeal, Gregory. *Drones and Aerial Surveillance: Considerations for Legislators*. Brookings Institution, November 2014.

## Data Regulation

A regulatory approach that is permissive of drone-based data collection should be cognizant of maintaining the privacy of the data that are collected. In instances where a warrant is obtained, current data retention practice applies, which is generally permissive of retaining that data as necessary. However, as the approach recommended above allows some data collection outside of warrants, data use and retention policies should be established as another way to protect privacy.

Law enforcement agencies typically want to store as much information as possible for as long as possible. These agencies assert such data may immediately or eventually prove useful in a criminal investigation. Privacy advocates prefer that imaging or other data from drones be immediately destroyed unless there is at least a reasonable suspicion that such data pertains to an ongoing investigation of criminal activity. Both positions are held outside of just data collected with a drone, but the issue comes up again since this is a new technology.

One way of limiting data retention to maintain or enhance an individual's expectation of privacy is to limit the data being collected in the first place, as is recommended above. But even within the bounds of the limits of duration of unwarranted surveillance, the collection and aggregation of 30 minutes of data on a specific person once a month over the course of several months or years moves that observation closer to being something like long-term observation rather than one-time incidental observation. Under current law, that may violate that individual's reasonable expectation of privacy given that repeated instances of limited surveillance were ruled unreasonable searches as part of the *United States v. Jones* case. To avoid this long-term unconstitutional act, the data about that person need only be destroyed on a regular basis.

To aid in limiting targeted surveillance activities without a warrant, **the program review committee recommends:**

- 9. A drone-based data retention policy shall be established for all law enforcement agencies within the state, as follows. Data collected via drone outside the terms of a warrant (either when no warrant was involved or when the data collected was incidental to the terms of a valid warrant) shall be reviewed within three months of collection.**

**If such data contains identifiable images of persons or property about whom there is no reasonable suspicion of criminal activity, the data shall be destroyed as soon as reasonably possible following the review.**

**If the data contains identifiable images of persons or property about whom there is a reasonable suspicion of criminal activity, the data may be retained for up to five years from the date of collection, unless a valid search or arrest warrant is issued in connection with the criminal activity captured in the data, in which case the data may be retained under the terms of the warrant.**

**If data is collected that contains identifiable images of persons or property across several classification (e.g., target of the warrant or a person about whom there is no reasonable suspicion), modifying the data to remove or otherwise make unidentifiable just those images of persons or property for which there is no reasonable suspicion shall fulfill the terms of this policy.**

Under this policy, data collected within the bounds of a warrant would be retained pursuant to current law enforcement record retention policies (i.e., kept as necessary, based partly on whether it was used as evidence in a criminal proceeding). Data collected inadvertently would be removed, but not at the expense of losing valid, useful data. Drone-based data created by sources outside of law enforcement, but given to law enforcement, would be subject to the same data retention policy. This would allow law enforcement access to useful information brought in from independent sources without compromising additional privacy rights.

This policy, in combination with the recommended surveillance policy, helps to balance concerns of safety and privacy. It assists in maintaining the privacy rights of individuals while allowing law enforcement agencies access to the data which should be most useful in criminal investigations.

### **Registration and Reporting**

Adopting registration and reporting requirements, without doing anything else, serves as an advanced version of keeping the status quo (option 1), but could also enhance all the other options as it gives policymakers significantly greater insight into where governmental drones are and how they are used.

In total, four states have adopted registration or reporting requirements for governmental drones, all of which have done so in conjunction with imposing other law enforcement drone use restrictions.<sup>28</sup> Only Illinois requires ownership reporting (i.e., registration) without more widespread use reporting. It is also the only state where a registration or reporting deadline has already occurred – the initial report indicates that there are three law-enforcement owned drones present in that state (the full report is available in Appendix A).

Two states, Oregon and Illinois, require that use reports be filed within 24 to 48 hours after a drone has been used in an emergency. Three of the four require annual reporting of some kind, while Texas mandates reporting in odd numbered years. Besides Illinois, the other three states required detailed reporting on drone use. Oregon’s legislation, in particular, combines a one-time registration requirement with an annual report on use.

**Governmental drone registration.** Requiring governmental drone registration allows the state to develop an ongoing inventory of the drones that are available and of all government drone users. Since the drones in question are owned by governmental entities, governmental drones do not need to be registered for tax purposes. However, having a complete inventory of governmental drones in the state can be beneficial in several ways.

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<sup>28</sup> Illinois, Oregon, Texas, and Utah

First, the inventory can give policymakers better information on the pervasiveness of drone use and how that may change over time. This can inform state policy on appropriate use and provide better understand of the scope of the issue if the state decides to change any drone law. Second, the information provided by the inventory may help the state coordinate more efficient use of the technology. That is, if the state (or another municipality) knows that a particular municipality owns a drone, it may request that the town use that drone in a time of emergency, rather than the state bringing its own drone to an area where one is already available. Likewise, knowing that a particular municipality or state agency has a drone may help alleviate safety issues where two drones from two different governmental groups are interfering with one another.

As awareness of which governmental entities in the state own drones increases government transparency and potentially aids all governmental agencies in coordinating drone use, **the program review committee recommends:**

**10. All state and local government-owned drones shall be registered with the Office of Policy and Management. The registration shall include the name of the government agency that owns the drone, the name(s) and contact information of those individuals who may operate the drone, and identification of the aircraft (at minimum make, model, and serial number). Such information shall be made available on the agency's website and updated monthly if additional aircraft are registered.**

**Reporting drone use.** In most regulatory options, the legislature could require all governmental drone use to be reported. Requiring well-documented use records does not interfere with beneficial uses of drones and allows law enforcement the opportunity to use drones more broadly. Use reporting also gives privacy advocates (along with policymakers and the public) objective information on how drones are being used and how often they are used for activities that might raise privacy concerns.

The specifics of what about the use is recorded can include who is using it and where, and can also include the purpose for which the drone was being used (e.g., mapping, surveillance with or without a warrant, search and rescue). Further, how the information collected from the drone was used (e.g., evidence in a criminal investigation, developing forestry or wildlife plans, or reviewing an emergency situation as part of ongoing training) would also be informative.

Installing reporting requirements does not directly prohibit activities that may lessen an individual's expectation of privacy. Future action would likely be necessary to prevent unwanted governmental activities and that action may be predicated on an undesirable drone use having happened. As with most reporting requirements, there is a chance the reporting requirements will not be monitored well, in which case they lose their effectiveness. Likewise, an overly burdensome reporting system, if adhered to, may discourage drone use of any type, including clearly beneficial uses.

While concerns raised throughout this study about privacy invasions through law-enforcement drone use are plentiful, there are no drones owned by Connecticut state or local law enforcement agencies as of the writing of this report. Careful monitoring of governmental

adoption and use of drones could occur simultaneously to observation of other developments in the industry (i.e., adoption of federal regulations and setting of judicial precedent).

As ongoing reporting of non-law enforcement drone use will be beneficial in maintaining knowledge of types of use and help keep all state agencies aware of how drones are used within state government agencies, **the program review committee recommends:**

- 11. All non-law enforcement state use of drones, including drones operated for the benefit of the state that are not owned by the state, shall be recorded and reported to the Office of Policy and Management annually. Such reports shall include the location, time, duration, and purpose of each drone use. The Office of Policy and Management shall publish aggregate summaries of these reports within 90 days of the annual reporting deadline, including identifying those agencies with drone ownership or past drone use that have failed to report on drone use.**

Ongoing reporting of state and local law enforcement drone use will be beneficial in maintaining knowledge of types of use, will help alleviate privacy concerns, and will help keep all law enforcement agencies aware of how drones are used by other law enforcement agencies within the state. Therefore, **the program review committee recommends:**

- 12. All state and local law enforcement use of drones, including drones operated for the benefit of the law enforcement activities that are not owned by the law enforcement agencies, shall be recorded and reported to the Office of the Chief State's Attorney annually.**

**Such reports shall include the location, time, duration, and purpose of each drone use, along with whether the drone use was conducted within the limits of a warrant. Law enforcement agencies shall report the frequency with which data obtained from a drone was deemed to provide evidence of reasonable suspicion of criminal activity, how often data was reviewed and destroyed under the data retention policy recommended above, and how often data was destroyed without being reviewed.**

**The Office of the Chief State's Attorney shall publish aggregate summaries of these reports within 90 days of the annual reporting deadline, including identifying those agencies with drone ownership or past drone use that have failed to report on drone use.**

## **Weaponization of Drones**

Special consideration needs to be given regarding law enforcement agencies' ability to equip drones with weapons. The weaponization of drones can range from delivery of non-lethal pacification systems (e.g., tear gas) to remote control of a lethal firearm. As remote operation of weapons was recommended to be prohibited in Chapter V, allowing law enforcement access to this classification of drone use would need to be specifically allowed.

There may be some precedent for allowing certain law enforcement to remotely control weapons. For instance, law enforcement agencies now may be able use robots with these type of capabilities in some tactical situations. However, drones carry several additional risk factors that ground-based remote controlled technology does not have.

First, there is a possibility that a drone carrying a weapon might malfunction during the flight and fail to get to the appropriate staging area. Were such a malfunction to take place, the weapon may be accidentally discharged upon collision, or it may be that the weapon itself is inadvertently lost or given to those the drone was trying to target.

Second, the precision necessary to properly use a weapon does not appear to be commonly available in drones at this time. The International Association of Chiefs of Police drone use guidelines state that “[g]iven the current state of the technology, the ability to effectively deploy weapons from a small [drones] is doubtful.” Because of these increased risks and a lack of a perceived benefit, **the program review committee recommends:**

**13. Law enforcement use of drones to remotely operate weapons shall be prohibited.**

This prohibition should remain in place until at least such a time that the need for, and safety of, this type of use can be affirmatively demonstrated. Any review of this prohibition should attempt to limit the allowable exceptions for this use to only those situations where all other reasonable alternatives have been exhausted.

### **Drone and Drone Pilot Safety**

Drones themselves should be operated in a safe manner. To do so, the drones need to be mechanically sound and the operators of drones must be capable of limiting their use to situations where they can be controlled. Drone safety protocols are currently handled by the FAA on a case by case basis as part of the certificate of waiver or authorization (COA) application process. However, the FAA is expected to include requirements for safe operation within its drone regulations. It is not yet known whether federal safety requirements for governmental drones and operators will differ significantly from non-governmental drones.

While governmental and non-governmental manned aircraft (and pilots) are technically faced with different certification requirements, the common practice is for governmental manned aircraft and pilots to follow standards that are at least as stringent as those for non-governmental manned aircraft. As FAA draft regulations pertaining to safety have not yet been made available for comment (or any type of drone, regardless of user or size), no specific recommendation is being made in this study regarding governmental safety protocols. Policymakers should continue to monitor federal developments regarding governmental drone use and take the steps necessary to ensure that drones are only used for governmental purposes when proper safety protocols have been followed.



## **Appendices**



## Illinois Drone Registration Report



### ILLINOIS CRIMINAL JUSTICE INFORMATION AUTHORITY

In accordance with the Freedom from Drone Surveillance Act [725 ILCS 167], the Illinois Criminal Justice Information Authority is mandated to publish on its publicly available website the following information for the previous fiscal year, as affirmed by each reporting agency.

Fiscal Year 2014  
July 1, 2013 – June 30, 2014

Agency	Number of Drones	Date of Purchase	Model	Status	Notes
Champaign County Sheriff's Office	1	March 19, 2008	RP Flight Systems-Spectra Flying Wing	Inoperative	
Downers Grove Police Department	1	June 1, 2014	UDI	Operative	Used for training purposes
Illinois State Police	1	Not reported	UDI	Operative	Model number U818A



## Agency Response



February 18, 2015

Carrie E. Vibert, Director  
Legislative Program Review and Investigations Committee  
State Capitol Room 506  
Hartford, CT 06106

Dear Ms. Vibert:

Thank you for offering the opportunity to comment on the Legislative Program Review and Investigation Committee's findings and recommendations regarding drone use regulations dated December 11, 2014. The Connecticut Airport Authority (CAA) appreciates the Committee's hard work to explore this important issue, and we value the Committee's input and suggestions.

As alluded to in the report, the CAA has legislation pending to further clarify the Authority's responsibility for and jurisdiction over aeronautics in the State of Connecticut. The CAA asserts that the intent of the enabling statutes, originally passed in 2011, was to transfer all responsibilities related to aeronautics from the Department of Transportation (DOT) to the CAA. This can be inferred by the general sentiments expressed by legislators involved in the crafting of the enabling statutes, as well as the fact that all DOT staff who handled aeronautics-related functions have since been transferred to the CAA. This CAA fully expects this legislation to pass during the current legislative session and, as a result, respectfully requests to be fully included in the process moving forward as any potential drone regulations take shape during the legislative session.

Furthermore, in light of the FAA's February 2015 proposed rules regarding the operation and certification of small unmanned aircraft systems (Docket No. FAA-2015-0150), the CAA is concerned by the Committee's recommendation to exempt unmanned aircraft in Connecticut from the aircraft registration requirements of C.G.S. Sec. 13b-39a to 13b-39d inclusive for a period of ten years. The FAA's proposed rules require registration for small unmanned aircraft systems, and the CAA believes that a shorter state moratorium of one or two years would allow sufficient time to review the impact of federal registration and prepare for state registration requirements. Generally, the CAA strongly urges the legislature to account for the FAA's proposed rules, as well as the relevant presidential memorandum dated February 15, 2015, when considering the establishment of new drone regulations in the state.

The CAA's primary concern is the safety of the state's aviation system, and we look forward to partnering with stakeholders at both the state and federal levels to determine the most effective ways to ensure safety in our skies.

Please feel free to contact me at (860) 292-2054 if I can assist in any way as the legislature moves forward examining this important issue.

Sincerely,

A handwritten signature in black ink that reads "Kevin A. Dillon". The signature is written in a cursive, flowing style.

Kevin A. Dillon, A.A.E.  
Executive Director  
Connecticut Airport Authority