

# Is Legislation Needed To Prevent



# Invasions of Privacy by Unmanned Aircraft?

## *The Law and Some Modest Legislative Proposals*

By David E. Schaffer

As the push to integrate unmanned aircraft systems (UAS) into the national airspace system (NAS) has increased, concerns about their impact on privacy has grown. Some of this concern may be due to the natural fear of any new technology. But there actually do seem to be differences between UAS and other aircraft that could make it easier for UAS to intrude into the private lives of citizens. In particular, since UAS do not need to fit a human inside, they can be very small and could therefore descend to very low levels unobtrusively.

Laws already are designed to protect people's privacy. But these laws may not be sufficient to fully address the privacy issues raised by UAS.

For the purposes of evaluating privacy laws and their relation to UAS, unmanned aircraft can be divided into two types. The first, government aircraft, includes all police and other law enforcement aircraft and are typically referred to in aviation law as public aircraft. The second, civil aircraft, includes all other aircraft, such as those belonging to private citizens and corporations.

### **Government Aircraft** Legal Background

Citizens are protected from governmental intrusion into their private life by the Fourth Amendment to the U.S. Constitution. In essence, this amendment means that the police can invade one's privacy only if they first obtain a warrant. The Fourth Amendment requires the federal government to obtain a warrant before it can search a person or that person's "houses, papers, and effects." The warrant requirement has been extended to cover intrusions by state and local government by the 14th Amendment to the Constitution. Several court decisions have also extended Fourth Amendment protections to cover the curtilage of the home, meaning the lawn and garden surrounding the home, including any structures located thereon.

To decide whether the warrant requirement of the Fourth Amendment applies in an individual case, courts first look to determine whether a "search" has occurred. For example, if a police officer is walking on a public street and looks into an open window of a home and sees a crime being committed, that is not a search, and no warrant is required. The rationale is that people have no reasonable expectation of privacy if they leave their windows open to plain view from a public street, and police cannot be expected to avert their eyes whenever they walk by. Likewise, if the police are flying in the navigable airspace and look down and see a crime being committed, that is not a search, and no warrant is required.<sup>1</sup> The courts have viewed the navigable airspace as analogous to a public street, and anything in plain view from that vantage point can be observed without first obtaining a warrant.

Reliance on the location of the aircraft in the navigable airspace is a useful legal standard governing aerial surveillance by fixed-wing aircraft because it effectively imposes objective altitude requirements regarding when a search would require a warrant. If a fixed-wing law enforcement aircraft were to descend below the minimum altitudes of the navigable airspace, the police, under current law, would have to get a warrant before they could observe the people or activity below.

However, the navigable airspace standard does not work as well in the case of helicopters. FAA rules generally allow a helicopter to descend to any level that is not hazardous.<sup>2</sup> Therefore, when faced with a case involving a law enforcement helicopter, the U.S. Supreme Court had to come up with a new standard for determining when the Fourth Amendment warrant requirement would apply. It decided that a law enforcement helicopter flying at 400 feet did not need a warrant to observe activity below, because flying helicopters at that altitude (1) was permitted by law and FAA regulations, (2) was not rare, (3) did not reveal any intimate details connected with the use of the home or curtilage, and (4) did not cause any undue

noise, wind, dust, or threat of injury.<sup>3</sup>

Various lower courts have taken the standard enunciated by the U.S. Supreme Court and reached differing conclusions. At least one court has found that a helicopter conducting aerial surveillance as low as 100 feet was not a search and did not require a warrant.<sup>4</sup> Another court decided that aerial surveillance at 200 feet was a search and did require a warrant.<sup>5</sup>

Even if a consistent interpretation of the Supreme Court's standard could be developed, it would not seem to fit well in the case of UAS. In all likelihood, law and FAA regulations will permit small UAS to fly at very low altitudes; such flights will not be rare; and due to their small size, these UAS will not cause undue noise, wind, dust, or threat of injury. Therefore, trying to apply existing case law to UAS is not likely to be effective in restricting privacy intrusions by government UAS.

It might be possible to wait for a UAS case to wind its way through the courts to establish a better standard for aerial surveillance by government UAS. This, however, is likely to take years.

## If no federal agency is prepared to issue regulations to fill the privacy gap, Congress should consider legislation to address privacy concerns now.

That is not likely to reassure those who are concerned about UAS threats to privacy now.

Another approach would be for a government agency to issue a regulation to address the privacy issue. The FAA might seem the logical agency to do that. But the GAO reports<sup>6</sup> that "FAA officials and others have suggested that regulating privacy issues in connection with equipment carried on UAS, such as surveillance sensors that do not affect safety, is outside the FAA's mission, which is primarily focused on aviation safety." The GAO went on to state that "[w]hile it is not clear what entity should be responsible for addressing privacy concerns across the federal government, many stakeholders believe that there should be federal regulations for the types of allowable uses of UAS to specifically protect the privacy of individuals."

The president recently issued a memorandum to address privacy issues raised by government UAS.<sup>7</sup> But this memorandum does not apply to UAS operated by state and local governments. For federal UAS, it does not explicitly limit what they can do but rather generally requires them to comply with privacy protections and to provide notice to the public about where they are authorized to operate.

### Legislative Options

If no federal agency is prepared to issue regulations to fill the privacy gap, Congress should consider legislation to address privacy concerns now. Two options are suggested below. The goal of these options is not to break new ground or provide more privacy rights than now exist. Rather, the goal is to extend existing rights to protect people from privacy intrusion by government UAS.

#### Option I

1. No unmanned aircraft operated by or on behalf of any federal, state, or local agency may operate at less than 400 feet above the ground for the purpose of observation, surveillance, or

the search of a person's house, papers, or effects unless a warrant has been issued authorizing such observation, surveillance, or search.

2. Paragraph 1 shall not apply in the case of an emergency where there is an imminent risk to life or property.
3. For the purposes of Paragraph 1, the term "unmanned aircraft" means an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft.<sup>8</sup>

A few observations about the above option should be made.

This option does not prevent a government UAS from descending below 400 feet. If the UAS was not conducting a search but instead was engaging in pipeline monitoring or border security, it could descend to any level. Even if it were engaged in law enforcement, it could still descend below 400 feet if it obtained a warrant or if there was an emergency. Also, the 400-foot standard is an objective standard, but the exact number chosen here is

somewhat arbitrary. It was chosen because that was the altitude that the Supreme Court expressly found acceptable in the *Riley* case involving a search by a helicopter. But the Court left open the possibility that a lower altitude might be acceptable in certain cases, and lower courts have approved observations without a warrant at lower altitudes.

#### Option II

1. No unmanned aircraft operated by or on behalf of any federal, state, or local government may operate at an altitude and in an area that is likely to enable a person to use the unmanned aircraft to view any intimate details connected with the use of a home or curtilage and with the intention of observing such details unless a warrant has been issued authorizing such observation.
2. Paragraph 1 shall not apply in the case of an emergency where there is an imminent risk to life or property.
3. For the purpose of Paragraph 1, the term "curtilage" means the area encompassing the grounds and buildings immediately surrounding a home or building that is used in the daily activities of domestic life.
4. For the purposes of Paragraph 1, the term "unmanned aircraft" means an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft.

A few observations should be made about this option.

The phrase "intimate details connected with the use of a home or curtilage" was derived from the *Riley* case that addressed a search by a helicopter. Unlike the 400-foot standard in Option 1, this "view any intimate details" standard is not an objective one and would require further refinement in the courts. However,

it does seem to address the problem that people are most concerned about—that a UAS could fly low and peer into their windows or otherwise observe intimate details of their life.

This option would not prohibit government UAS from flying low to engage in other activities as long as it is not done with the intention of peering into an area where there is an expectation of privacy.

If one of the options above were enacted into law and a government UAS did not comply, the typical sanction would be that any evidence it helped the government obtain would not be admissible in a court of law.

## **Civil Aircraft Legal Background**

Unlike government aircraft, there is no provision in the Constitution that explicitly protects citizens from intrusions by civil aircraft. Rather, various common law theories have been developed through the courts to protect the privacy of citizens.

One such theory is the tort of trespass. This tort is designed to prohibit one from intruding on or through the property of another. Originally, courts viewed one's property as including the airspace above it, extending all the way to the heavens. However, this view began to break down with the invention of the airplane. Now it seems that courts view one's property as including only such airspace as one uses (such as by constructing a house or other building on it) or as extending only up to the navigable airspace. Under this view, if an aircraft flew over one's property but beneath the navigable airspace, it could be considered a trespass. But, as noted above, this navigable airspace limit does not seem to work well to limit flights by either helicopters or UAS.

Another theory of law that could protect people from UAS is the tort of nuisance. This tort is designed to prohibit one from interfering with another's use and enjoyment of his or her property. Unlike trespass, which gives the property owner the absolute right to keep others off his land or out of his airspace, nuisance involves a balancing of the owner's right to the use and enjoyment of his property against the needs of another to use the airspace. Applying the nuisance theory of law, courts have tended to allow over-flights of property unless the flights were so low as to bother or threaten people on the ground. As such, this is similar to the standard used by the Supreme Court in the *Riley* case, where it allowed a helicopter to fly at 400 feet as long as it did not cause any undue noise, wind, dust, or threat of injury. As noted above, however, this idea of a UAS as a potential nuisance might be hard to apply in a case involving a small and relatively quiet UAS.

A final common law theory is the more recently developed tort of invasion of privacy. There are several versions of this tort, but the one most relevant here prohibits a person from intentionally intruding upon the solitude or seclusion of another or upon the other's private affairs if the intrusion would be considered highly offensive by a reasonable person.<sup>9</sup> So, for example, this would prohibit one from peering into the windows of a private home. It has also been held to prohibit journalists from intruding, by either physical or electronic means, into the seclusion of another while gathering news.<sup>10</sup> This tort theory could be effective in protecting citizens from intrusions by UAS in areas where people have a reasonable expectation of privacy, such as their homes. However, this tort, like any tort, requires people to go to court to ensure that their rights are respected. Many people are reluctant to undergo the time and expense of the judicial

process especially where, as here, the monetary damages that they could expect to receive for an invasion of privacy are uncertain at best.<sup>11</sup>

As with government aircraft, better privacy protection could probably be provided through laws or regulations than by reliance on the courts.

The FAA could issue a safety rule for UAS that would have the effect of addressing the privacy issue. For example, it could define the navigable airspace for UAS, or establish minimum safe altitudes for UAS, or require all UAS, even small ones, to fly under instrument flight rules (IFR). These would all have the effect of keeping UAS above a specified level and away from homes and other congested areas. However, it is unclear whether the FAA would take such action without a clear safety justification, especially since it is likely to undermine the business case for the small UAS.

The presidential UAS memorandum also addressed privacy issues raised by civil aircraft. But it did not impose any requirements—it merely directed the National Telecommunications and Information Administration to consult with stakeholders to develop best practices.

### **Legislative Options: General**

Another option would be for Congress to pass a law to provide protection from privacy intrusion by UAS. Given the interstate nature of air transportation, Congress would be justified in addressing UAS privacy issues and preempting any contrary state action. Even if Congress decided to leave this matter to the states, there would be value here in offering some model statutes that states could consider. Many states already have anti-intrusion laws designed to protect the privacy of its citizens. An example is this law from Massachusetts:

“Section 1B. A person shall have a right against unreasonable, substantial or serious interference with his privacy. The superior court shall have jurisdiction in equity to enforce such right and in connection therewith to award damages.”

This Massachusetts law could be interpreted to cover invasions of privacy by UAS but, by its terms, does not apply to UAS specifically. It would be possible, however, to draft a statute that would cover privacy invasions by UAS specifically.

### **Legislative Options: Advantages**

One of the advantages of pursuing the legislative option is that a subsection could be included in any such law to empower a federal or state prosecutor to get involved and prosecute a UAS operator for privacy violations. That would overcome one of the main problems with the common law remedies described above, in that the common law remedies all require individuals to sue in court to vindicate their rights, something that most people have neither the time nor money to do. By contrast, legislation could authorize the government to go into court on behalf of the aggrieved individual and seek fines or other penalties against the offending UAS operator. The fines in the draft legislation set forth below are quite modest. But they could be made tougher. Civil fines for violating other aviation laws often run much higher.<sup>12</sup> Harsher criminal penalties could also be imposed if deemed appropriate.<sup>13</sup>

### Legislative Options: Paparazzi Model

An existing anti-intrusion law could be used as a model and be modified to apply specifically to UAS. For example, an anti-paparazzi law could be modified in this way. The lengthy California Anti-Paparazzi Statute at California Civil Code, § 1708.8, is a good example. It could be modified to prohibit an owner or operator of an unmanned aircraft from using that aircraft, or any equipment on board that aircraft, to attempt to capture, in a manner that is offensive to a reasonable person, any type of visual image or other physical impression of a person engaging in a personal or familial activity under circumstances in which that person had a reasonable expectation of privacy, regardless of whether there is a physical trespass.

A paparazzi statute like this may be a particularly appropriate model, because the use of UAS by paparazzi seems to be one of the areas of great concern. (An article in the Dec. 10, 2012, issue of *Newsweek* magazine described potential paparazzi use of UAS as “very frightening” and “very inevitable.”)

### Legislative Options: Peeping Tom Model

Another model that could be modified to cover UAS is a peeping Tom law. The following is based on the peeping Tom law in South Carolina Code 16-17-470:

1. It shall be unlawful for a person to operate an unmanned aircraft in order to be an eavesdropper or a peeping tom on, above, or about the premises of another or to fly over or about the premises of another for the purpose of becoming an eavesdropper or a peeping Tom.
2. The term "peeping Tom," as used in this section, is defined as a person who uses an unmanned aircraft to look through windows, doors, or other similar places on, above, or about the premises of another for the purpose of spying upon or invading the privacy of another and any other conduct of a similar nature that tends to invade the privacy of others. The term "peeping Tom" also includes any person who employs the use of video or audio equipment for the purposes set forth in this section.
3. A person who violates the provisions of this section is guilty of a misdemeanor and, upon conviction, must be fined not more than \$500 or imprisoned not more than three years, or both.
4. The provisions of subsection (I) do not apply to:
  - (a) viewing, photographing, videotaping, or filming by personnel of the Department of Corrections or of a county, municipal, or local jail or detention center or correctional facility for security purposes or during investigation of alleged misconduct by a person in the custody of the Department of Corrections or a county, municipal, or local jail or detention center or correctional facility;
  - (b) security surveillance for the purposes of decreasing or prosecuting theft, shoplifting, or other security surveillance measures in bona fide business establishments;
  - (c) any official law enforcement activities authorized by law;
  - (d) private detectives and investigators conducting surveillance in the ordinary course of business; or
  - (e) any bona fide news gathering activities.
5. In addition to any other punishment prescribed by this section or other provision of law, a person procuring photographs, audio recordings, video recordings, digital electronic files,

or films in violation of this section shall immediately forfeit all items. These items must be destroyed when no longer required for evidentiary purposes.

6. For the purposes of this section, “unmanned aircraft” means an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft.

### Legislative Options: Harassment Model

As a general rule, one has a right to privacy only when in a place where one has a reasonable expectation of privacy. This means that usually the right to privacy does not apply when one is out in public. However, some are concerned that a UAS could be used to follow people in public and that, at the very least, this would be annoying. If there is a desire to address this concern, it might be more effective to do so using an anti-harassment statute as a model rather than a privacy statute. One such statute is the New York State Penal Law, section 240.26. If modified to apply specifically to UAS, it could read as follows:

1. An operator of an unmanned aircraft shall not, with the intent to harass, annoy, or alarm another person, use that aircraft to
  - (a) follow that person in or about a public place or places or
  - (b) engage in a course of conduct or repeatedly commit acts which alarm or seriously annoy such other person and which serve no legitimate purpose.
2. A violation of section (1) is punishable by a fine not to exceed \$2,000 or imprisonment not to exceed one year, or both.
3. For the purposes of this section, “unmanned aircraft” means an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft

### Related Issues and Remedies Image-Enhancing Equipment

An additional concern with UAS is that not only could they be used to spy on people, but they could do so with sophisticated technical equipment.

The general rule is that it is not an invasion of privacy to see something from an aircraft with the naked eye if the aircraft is in a place where it has the right to be. In the *Ciraolo* case involving the fixed-wing aircraft, the Supreme Court stated that the “Fourth Amendment simply does not require the police traveling in the public airways at this altitude to obtain a warrant in order to observe what is visible to the naked eye.” This raised the question of whether the Court would have considered it an invasion of privacy if something more powerful than the naked eye had been used.

The Supreme Court began to answer this question in the case of *Dow Chemical Co. v. United States*, 476 U.S. 227 (1986). There, the government used a powerful camera to observe Dow Chemical’s facilities from the air. The Court stated, at page 238, that the “mere fact that human vision is enhanced somewhat, at least to the degree here, does not give rise to constitutional problems.” So the use of enhanced vision technologies is not necessarily an invasion of privacy. But the *Dow Chemical* case involved the surveillance of an industrial facility. It remained unclear whether a similar search of a home or the use of more powerful equipment would be permitted.

In 2001 in *Kyllo v. United States*, 533 U.S. 27 (2001), the Supreme Court decided the government had gone too far. In that case, the Court stated that the government’s use of a thermal-

imaging device to scan a home to determine how much heat was being generated inside was an invasion of privacy. Lower courts have reached differing conclusions. Some courts have found that it is not an invasion of privacy to use a telephoto lens to observe someone in his front yard<sup>14</sup> or his automobile. But other courts have

property but may not use deadly force unless it is necessary to protect oneself or one's family from physical harm.<sup>15</sup> However, it is unlikely that an invasion of privacy by a UAS would justify shooting it down, because an invasion of privacy is not a physical harm. On the other hand, the cases where deadly force was found excessive involved instances

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found that it may be an invasion of privacy to use a powerful lens or image-enhancing equipment to look inside a home.

Determining whether the use of image-enhancing equipment is an invasion of privacy seems to depend on two factors. The first is whether it is being used to observe a home rather than an area where there is a lesser expectation of privacy, and the second is whether the image-enhancing equipment is commonly available to the public or highly sophisticated surveillance equipment not generally available to the public.

It may be fair to conclude that the law will permit the use of an image-enhancing device as long as it is commonly available to the public, such as binoculars or a telephoto lens, and it is not used to look inside a home. A prohibition on sophisticated image-enhancing devices to look inside a home could be added to any of the draft legislative proposals suggested above. However, the concerns about image-enhancing equipment are not peculiar to UAS. The same concerns should exist whether the image-enhancing equipment is attached to a UAS, a helicopter, a fixed-wing aircraft, an auto, or in a window across the street. The question is whether there is any justification for a law restricting image-enhancing equipment on UAS if the same restrictions are not also placed at least on other types of aircraft.

### **Special Lighting**

One of the characteristics of UAS that makes them particularly troublesome from a privacy standpoint is that they can be small and unobtrusive. This means that they could spy on someone without that person even realizing it. The above draft legislation is designed to prevent that. But failing that, another approach would be to at least warn people that a UAS is hovering above them. Regulations could require UAS to flash lights or sound beeps when they descend below a specified level. The FAA already has extensive regulations on aircraft lighting in 14 CFR Part 23. Those regulations exist for safety reasons. FAA might want to consider a lighting requirement for low-flying UAS to warn people of their presence. There might be a safety justification for this as well as a privacy benefit.

### **Self-help**

Some have suggested that they would shoot down a UAS that was watching or bothering them. This issue arose on Nov. 19, 2012, when lehighvalleylive.com reported that a hunter had shot down a UAS being operated by the group known as Showing Animals Respect and Kindness. This group was using the UAS to film a pigeon shoot in Perry Township, Pennsylvania.

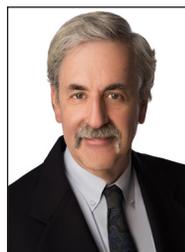
As a general rule, one may use reasonable force to defend one's

where the intruder who was shot was a person, not a machine, such as a UAS. So it is possible that a court could take a more permissive view on the use of deadly force against a UAS than it would against a human intruder. However, since a damaged UAS could crash and hit someone on the ground or start a fire, it would seem that calling the police or seeking remedies through the courts would be the more prudent course. In the Pennsylvania hunting case, the state police reportedly characterized the shoot-down of the UAS as "criminal mischief." It should also be noted that some states, although not Pennsylvania, have laws that protect hunters from harassment, although those statutes do not mention UAS specifically, perhaps because the UAS technology is so new. *See*, for example, the Sportsman's Rights Act, Texas Parks & Wildlife Code § 62.0125.

### **Conclusion**

Several bills have been introduced in Congress, and some have been enacted, that are designed to protect a person's privacy. Those bills and laws tend to involve protecting the privacy of personal information that has already been collected rather than restricting how the information is collected in the first place.

Existing privacy rules governing aircraft do not seem to fit the type of operations that small, unmanned aircraft could provide. Given this gap in the law, action is needed to ensure that the privacy of American citizens is protected. Waiting for the courts to rule definitively on this issue may take years. Therefore, legislative action is the best way to reassure the public and facilitate the integration of UAS into the national airspace system.



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Sen. Pressler); *see also* 60 Fed. Reg. 5237, 5239 (1995).

<sup>28</sup>*See* expert review of the issues by former FAA attorney Irene Howie, *Curing the Confusion: Who Regulates Government Air Medical Flight Safety?*, 22 THE AIR & SPACE LAWYER 3 (2009). States such as Maryland and county units in the states of Florida, New York, California and Pennsylvania may continue to transport members of the general public under so-called public aircraft operations.

<sup>29</sup>*Dennis Common Carrier Application*, 63 MOTOR CARRIER CASES 66, at 69 (1954).

<sup>30</sup>In the classic description of the close federal/airline industry connection, Justice Robert H. Jackson in *Northwest Airlines v. Minnesota*, 322 U.S. 292, 303 (1944) described: “Federal control is intensive and exclusive. Planes do not wander about the sky like vagrant clouds. They move only by Federal permission, subject to Federal inspection, in the hands of Federally certified personnel, and under an intricate system of Federal commands.” In contrast to areas historically subject to state regulation, operations of an air carrier engaged in air transportation have always been intensively and virtually exclusively regulated by the federal government. DOT Order 98-12-27 at 44.

<sup>31</sup>In addition, as mentioned, because of the dual air/medical nature of an air-ambulance operation, and the resulting medical services jurisdiction of HHS, that department has requirements that may apply under its Medicare/Medicaid programs. An HHS statute makes it a crime for parties on either side of a transaction to “offer, pay, solicit or receive” any remuneration to purposefully induce the referral of Medicare/Medicaid air ambulance services. 42 USC § 1320-7b(b). The Office of Inspector General (OIG) at HHS cautions that inflated payments to a state in return for access to emergency medical service patients may constitute a prohibited kickback. 68 Fed. Reg. 14245, at 14253 (2003). Restricted state 911 dispatch service programs, with inflated fees demanded of air-ambulances in return for program access, may raise serious air-ambulance-liability issues.

<sup>32</sup>49 USC § 40116; Pub. L. 93-44, 87 Stat. 90 (1973).

<sup>33</sup>*Hawaii Inspection Fee Proceeding*, DOT Order 2012-1-16,

Jan. 24, 2012.

<sup>34</sup>*Id.* at 18.

<sup>35</sup>The AHTA lists acceptable state taxes on air carriers as: property taxes (if no higher than similar companies), net income taxes, franchise taxes, or sales or use taxes on the sale of goods or services (such as jet fuel). But *see* detailed discussion of close questions surrounding such fuel taxes at 58 JOURNAL OF AIR LAW & COMMERCE 103 (1992).

<sup>36</sup>The operating companies are supported by dozens of trade associations, such as AAMS, Association of Air Medical Services; CAMTS, Commission of Accreditation of Medical Transport Services; AMOA, Air Medical Operators Association; HAI, Helicopter Assoc. Int’l; NPAA, Nonprofit Air Ambulance Alliance; NASEMSO, National Assoc. of State EMS Officials; IAFP, Int’l Assoc. of Flight Paramedics; and others.

<sup>37</sup>The TV hit ran for 11 years (1972 to 83) with the lifesaving times and antics of the 4077th Mobile Army Surgical Hospital (MASH) unit in South Korea, highlighted by such things as company clerk “Radar” O’Reilly’s uncanny ability to hear incoming helicopters with patients in advance of anyone, expanding slightly the lifesaving golden hour for quick treatment. The final episode became the most-watched TV show in American history, with 106 million viewers.

<sup>38</sup>While the immediate Ebola threat subsided, the specter of such a repeat disaster remains and haunts many, with extra precautions and procedures continuing behind the scenes. *See* Ebola Guidance for Airlines on the Internet.

<sup>39</sup>In a recent, significant FAA rule-making proceeding to strengthen air ambulance safety requirements (FAA docket 2010-0982), the FAA had occasion to report on the size of U.S. helicopter emergency-medical service (HEMS) operations. During 2003 to 2008, the industry underwent a 54 percent increase in the number of helicopters in operation. In 2009, some 74 HEMS operators flew approximately 850 helicopters, with the operators ranging in size from one aircraft to the largest operator being the 10th largest air carrier in the nation.

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### Endnotes

<sup>1</sup>*California v. Ciraolo*, 476 U.S. 207 (1986).

<sup>2</sup>14 C.F.R. § 91.119.

<sup>3</sup>*Florida v. Riley*, 488 U.S. 445 (1989).

<sup>4</sup>*United States v. Boyster*, 436 F. 3d 986 (8th Cir. 2006).

<sup>5</sup>*People v. Pollock*, 796 P.2d 63 (Colo.App. 1990).

<sup>6</sup>“Unmanned Aircraft Systems” GAO-12-981, September 2012, p.36.

<sup>7</sup>*Presidential Memorandum: Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems* (Feb. 15, 2015), available at [www.whitehouse.gov/the-press-office/2015/02/15/presidential-memorandum-promoting-economic-competitiveness-while-safegua](http://www.whitehouse.gov/the-press-office/2015/02/15/presidential-memorandum-promoting-economic-competitiveness-while-safegua).

<sup>8</sup>This definition is derived from section 331(8) of the FAA Modernization and Reform Act of 2012 (Public Law 112-95, 126 Stat 72, Feb. 14, 2012).

<sup>9</sup>Restatement Second of Torts, section 652B (1976).

<sup>10</sup>*Dieteman v. Time Inc.*, 449 F. 2d 245 (9th Cir. 1971); Am. Jur. 2d, Privacy § 50.

<sup>11</sup>*See* M. Ryan Calo, *The Drone as Privacy Catalyst*, 64 STAN L. REV. ONLINE 29 (2011) [“Tort recovery founders on the question of damages.”]

<sup>12</sup>*See* 49 U.S.C. 46301, where fines of \$25,000 per violation or per flight are typical.

<sup>13</sup>*See*, for example, 49 U.S.C. 46311, where imprisonment for two years is the penalty for unlawful disclosure of information.

<sup>14</sup>*I.C.U. Investigations Inc. v. Jones*, 780 So.2d 685 (Ala. 2000).

<sup>15</sup>Am Jur 2D, *Assault and Battery*, § 60.