

ZONING AND PLANNING LAW REPORT



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Why Land Use Lawyers Care About the Law of Unmanned Systems

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Introduction

Land use lawyers by definition are concerned about the use and regulation of land. Now, a new dimension of land use and land use regulation is on its way. Land use lawyers must be prepared to protect client land use interests in the National Airspace System. The reason is the National Airspace System touches the surface of public and private property; it touches the traditional home “curtilage.” Very soon a new type of interest will compete to use, and regulate the use of, the National Airspace System. Land use lawyers will be among those on the front lines to figure out the rules of the game, having a role in representing any one of the participants.

Technology has ushered in a new era. Drones—Unmanned Aerial Systems (UAS)—are everywhere and they will be in more places tomorrow.¹ These domestic, civil machines are poised to do almost anything: precision farming (precisely identifying and reporting

plant needs); delivery of online orders within a matter of hours or minutes; deliver medicines to inaccessible places; swiftly find and rescue lost hikers or kids; fly over inaccessible debris to find landslide or tornado victims; fight forest fires without jeopardizing the lives of “hot shots;” “RoboBees”² to pollinate crops to aid the declining bee population; and so forth. Federal law requires the Federal Aviation Administration (FAA) to “provide for” the safe integration of UAS into the National Airspace System by September 2015.³ At the same time, the public’s dystopian view of drones and the technology’s potential to do evil, portends turbulence in the wake of federal UAS integration. The Predator would not have been the industry’s first choice of an ambassador.

This article looks ahead at the integration of drones into U.S. airspace and considers legal issues that are necessary to resolve to achieve successful integration and broad public acceptance of the technology.

ZONING AND PLANNING LAW REPORT

Why Land Use Lawyers Care About the Law of Unmanned Systems..... 1

Introduction 1

A Brief History of the Drone and a Glimpse into its Future 2

Drones For Fun..... 4

Drones for Every Purpose..... 4

Legal Issues Regulating Drones..... 5

Basic Ground Rules 6

The Regulatory Roles of the FAA and State and Local Governments 7

Summary..... 14

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A Brief History of the Drone and a Glimpse into its Future

Drones have been around a long time. They’ve been called a lot of different things—remotely piloted vehicles (RPVs), unmanned aerial vehicles (UAV), and radio controlled aircraft (R/C), to name a few. These terms all refer to the same type of thing—an unmanned aerial contraption. The term for the technology used by the regulatory and regulated community is “Unmanned Aerial System.” The FAA explains “the term UAS is used to emphasize the fact that separate system components are required to support airborne operations without a pilot onboard the aircraft.”⁴ Nevertheless, when the public thinks of unmanned aerial systems, the public thinks of drones. This paper recognizes this fact of life and uses both terms.

Unmanned aerial technology, like other important technology, originated with the military. In the American Civil war, unmanned bomb filled balloons were floated over enemy territory in hopes that they would explode at the right time and place. However, air currents are inexact and the results of such efforts were often undesirable. When wind direction changed, the airborne cargo often returned home.

Winged aircraft allowed unmanned technology to progress because it was now reasonably controllable. The first pilotless aircraft was designed in the United Kingdom for use during World War I; a 1916 radio controlled “Aerial Target” and the “automatic airplane” named the “flying bomb” of the same period. While neither was used in the battlefield, the promise of pilotless war craft controlled by gyroscopes, encouraged further exploration into the technology. The first large scale production of a UAS was a product of British actor and Royal Flying Corps member Reginald Denny. Denny developed unmanned aircraft that were used by the British military as aerial targets for artillery gunners.

It did not take long for unmanned aircraft technology to pique the interest of the United States armed services. The U.S. military initially focused on remote pilotless aircraft to fly precise missions otherwise impossible due to limitations of pilot safety and maneuverability. Pilotless aircraft had the added benefit of anonymity and plausible deniability. Thus, during the Cold War, UAS’ flew reconnaissance missions of many types, including testing for radioactivity after a suspected nuclear test. Secret data from UAS began streaming in from North Vietnam, Russia, Communist China, and North Korea.

In the 11 years of the Vietnam War, 3,435 drones were deployed on a variety of missions and just 554 were lost.

While the drones of this era were successful in performing reconnaissance missions, it was not until the 1980s when drones would be successfully used to deliver military ordnance. The 1980s was the age of great discovery for UAS' and, at the end of that decade, ballistic weapons and countermeasure tactics were tested on drones. The Balkans, Afghanistan, and Iraq all were the proving grounds for the famous "Predator Drone". The Predator needs no introduction.

The military saw other important uses for UAS technology and began testing and using UAS in non-battlefield contexts such as atmospheric research, earth and weather observation, endurance operations using photovoltaic cells (designed in the 1950s but never used aloft), and policing remote areas.

Most UAS research and development funding still comes from an arm of the Department of Defense called the Defense Advanced Research Projects Agency (DARPA), self-described on its website as follows:

DARPA was established in 1958 to prevent strategic surprise from negatively impacting U.S. national security and create strategic surprise for U.S. adversaries by maintaining the technological superiority of the U.S. military.

To fulfill its mission, the Agency relies on diverse performers to apply multi-disciplinary approaches to both advance knowledge through basic research and create innovative technologies that address current practical problems through applied research. DARPA's scientific investigations span the gamut from laboratory efforts to the creation of full-scale technology demonstrations in the fields of biology, medicine, computer science, chemistry, physics, engineering, mathematics, material sciences, social sciences, neurosciences and more. As the DoD's primary innovation engine, DARPA undertakes projects that are finite in duration but that create lasting revolutionary change.

Major universities, including Harvard and MIT have UAS development programs.⁵ But without the assistance of DARPA, civil U.S. UAS technology would be well behind the rest of the world.

UAS come in all shapes and sizes. Some look like hummingbirds, or honey bees or even mosquitos. Currently, the largest UAS manufactured—the "Global Hawk"—is used by NASA for high altitude long endurance environmental science missions. Its wingspan

is 131 feet; its length is 48 feet; it has a take-off weight of 32,250 pounds, and can stay aloft for 28 hours.

Domestic drones are used by public agencies or public or major private universities in agricultural applications; fire detection and suppression; emergency first response search and rescue operations; weather services; cityscape services; law enforcement; and homeland security for border surveillance.

An example of a successful experimental program the Oregon State University (OSU) Hermiston Agricultural Research and Extension Center (HAREC) program. OSU is a leading university experimenting with UAS technology to improve crop management and yields. In this program, small UAS—known in the industry as "sUAS"—are equipped with high resolution cameras and infrared sensors and flown throughout a farm to detect the beginnings of a pest infestation or dry parts of a crop, reporting the data and enabling the farmer to deploy selective watering and pest management to conserve water and avoid overuse of pesticides. One of the sUAS that OSU is testing is the Tetracam Hawkeye. The Hawkeye is easy to use, low cost, and reasonably safe because it is easy to spot with its bright colors, and "with its chute continually deployed, if a malfunction occurs while the craft is airborne, the Hawkeye is designed to simply float to the ground protecting the craft and its camera cargo from damage." The Hawkeye is about the size of a suitcase and weighs 8 lbs.⁶ OSU's project, located in Oregon farm and ranch country, has strong local and regional acceptance:

Allaying concerns about privacy, [OSU UAS Research Director Phil] Hamm said, "These unmanned aircraft are for agricultural research only and will be used to do nothing more than that. This is about helping our local growers do a better job of growing crops, something HAREC has been doing for the past 102 years."

The Federal Aviation Administration has authorized the flights of the aircraft, which aren't allowed to fly higher than 400 feet and must stay within sight of the operator, typically less than a mile away. <http://oregonstate.edu/dept/hermiston/unmanned-aircraft-research>

Another example of anticipated beneficial uses of UAS technology is crowd and special event safety. UAS are being developed that could detect bombs of the type that exploded near the finish line of the Boston Marathon. UAS can be outfitted with logic software that searches out wiring where it should not be

and that couples it with both above surface and ground penetrating radar.

UAS may be very light, can carry significant payload, and can reliably and accurately access areas that are not possible with manned flight. UAS have no physiological needs and may stay aloft for days or even longer depending on the fuel source, making them unusually valuable workhorses.

Drones For Fun

Recreational enthusiasts have long found unmanned aircraft a source of great amusement. Many American children grew up playing with beloved radio controlled helicopters or planes. FAA has never regulated recreational or hobby use of UAS technology. The use of UAS for recreational or hobby use for decades was subject to only voluntarily guidelines under the terms of a June, 1981 FAA advisory circular: “Model Aircraft Operating Standards” Advisory Circular 91-57.

In 2007, however, when it became clear to the FAA that the technology would be used far more frequently and for more diverse purposes than grownup or child’s play, the FAA added a new administrative guidance regarding the use of UAS’ “Unmanned Aircraft Operations in the National Airspace System” Advisory Circular FAA 2006-25714.⁷ (2007 Guidance). In the 2007 Guidance, FAA defines an “unmanned aircraft” to include “a remotely controlled model aircraft used for recreational purposes” and stated that the authorizations in Advisory Circular 91-57 “specifically excludes its use by persons or companies for business purposes.” The 2007 Advisory Circular, while couched as policy, was the first time the FAA claimed that to fly any model aircraft for a “business purpose” required special federal permission called a “Certificate of Authorization” (COA) from the FAA. The FAA explained that to fly a particular type of aircraft, including UAS, requires an “Experimental Certificate.” This certification is virtually impossible for most civil operators to obtain. The FAA finished off any hope of commercial UAS when it declared it would issue COAs only to public agencies, not to civil applicants and that civil commercial operators simply need not apply:

Currently, there are no means to obtain an authorization for commercial UAS operations in the [National Air Space]. However, manufacturers may apply for an experimental certificate for the purposes of R&D, market survey and crew training.⁸

On the other hand, as we have seen, the regulatory environment for *publically* sponsored noncommercial UAS applications is robust. The FAA has issued hundreds of limited Certificates of Authorization to public agencies to fly specific types of UAS missions.⁹

The table was set, civil commercial UAS operations in the National Airspace System (NAS) were grounded. Civil (nonpublic agency) use of drones was just for fun. Until 2012.

Drones for Every Purpose

By 2012 it was clear UAS technology was in great demand. Farmers were demanding the right to fly drones in precision agriculture and others were similarly pressing Congress. Congress responded by enacting in 2012 the FAA Modernization and Reform Act of 2012 (FMRA). FMRA requires FAA to take actions to integrate UAS into the NAS. Among other things, FMRA requires FAA to (1) develop a comprehensive plan to “safely accelerate the integration of civil unmanned aircraft systems into the national airspace system” by November 12, 2012, and declared this Comprehensive Plan “shall provide for the safe integration of civil unmanned aircraft systems into the national airspace system as soon as practicable *but not later than September 30, 2015;*”¹⁰ (2) publish a rule “that will allow for civil operation” of small UAS (less than 55 lbs.) by August 13, 2013;¹¹ and (3) publish a notice of proposed rulemaking to integrate all other types of UAS by August 14, 2014.¹² FAA missed all of the above deadlines that have come and gone to date. Few expect FAA to meet the deadlines that have not yet expired. FAA has published no notices of rulemaking or final rules for any UAS. FAA did tardily publish its “Unmanned Aircraft Systems (UAS) Comprehensive Plan” (Comprehensive Plan) and “Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap” (Roadmap) on November 7, 2013 (nearly a year late). The Roadmap outlines FAA’s priorities in UAS integration:

The FAA has placed a high priority on the development of rules for sUAS that will increase access to the [National Air Space] and provide an initial opportunity for commercial operations. In the long-term, the principal objective of the aviation regulatory framework is to achieve and maintain the highest possible uniform level of safety while maintaining or increasing the efficiency and the environmental performance of the NAS. In the

case of UAS, this means ensuring the safety of all airspace users as well as the safety of persons and property on the ground.¹³

UAS integration will not mean segregating UAS from other aircraft flying in the National Airspace System; rather the FAA has explained: “Currently there are no actions being taken to establish a ‘special UAS airspace’. This ‘special UAS airspace’ would be counter to the idea of integrating unmanned aircraft into the [National Airspace System] NAS because it would be segregating, not integrating.”¹⁴

It is evident from both the Comprehensive Plan and the Roadmap that the FAA plans a slow integration over a period of years. It is also equally evident that the demands of agriculture, first responders, and commercial vendors to deploy the technology at a quicker pace will be hard for FAA to continue to ignore. An April 8, 2014, letter signed by the Academy of Model Aeronautics (AMA), Association for Unmanned Vehicle Systems International (AUVSI), American Society of Agronomy, Air Traffic Control Association, Crop Science Society of America, National Association of Wheat Growers, National Barley Growers Association, International Society of Precision Agriculture, and 28 other organizations implored the FAA to move quickly establish rule to authorize a program to integrate civil commercial UAS.

Under FRMA,¹⁵ the FAA was required to establish six ranges across the United States for testing UAS technology. While behind FMRA’s schedule to do so, on December 30, 2013, FAA designated six test site operators: (1) University of Alaska (includes sites in Oregon and Hawaii), (2) Nevada, (3) New York Griffiss Airport, (4) North Dakota Department of Commerce, (5) Texas A & B, and (6) Virginia Polytechnic Institute and Virginia Tech.

The FAA expects the six test range sites to supply opportunities to test UAS including:

- (1) Take-off and landing capabilities
- (2) High speed flight
- (3) Maritime (launch/maneuverability/recovery) capabilities
- (4) Operations at extremely high altitudes, and
- (5) Evaluation of dissimilar aircraft at multiple altitudes;

Other operations FAA expects to be explored at the test sites are UAS performance in mountainous terrain, hot weather locations, locations near busy airports, and other circumstances that will test the dependability of the UAS’s onboard systems, and specific operator’s needs.

FMRA also carries forward much of the regulatory scope of the FAA circulars for model aircraft. FMRA Sec. 336, specifically prohibits the FAA from issuing rules limiting or prohibiting model hobby or recreational use aircraft use, so long as:

1. The aircraft is flown within the line of sight of the operator and *used solely for hobby or recreational purposes*.
2. The aircraft is less than 55 pounds * * *;
3. The aircraft “does not interfere with and gives way to any manned aircraft”,
4. The aircraft is “operated in accordance with a community-based set of safety guidelines and within the programming of a nationwide community based organization”;
5. The operator of the model aircraft notifies both the airport operator and air traffic control tower is flown in an area within 5 miles of an airport.

Congress reserved to the FAA enforcement authority against any user—recreational or otherwise—who “endanger the safety of the national airspace system.”¹⁶

Legal Issues Regulating Drones

UAS integration presents technological, policy and legal challenges. We know the technology hurdles will be resolved, because the economic incentives to do so are enormous: “During the 11-year period 2015-2025 UAS integration is expected to contribute \$82.1 billion to the nation’s economy by agriculture, public safety and other activities and 103,776” new high wage jobs will be created.¹⁷

The legal issues to work out include: (1) who is in charge and what role do state and local governments have to play? After all, many local codes currently regulate where airports and heliports may be located and the definitions of “airport” or “heliport” will likely also cover areas where UAS take off and land vertically or laterally. Will the FAA allow such rules to apply to UAS? Can land use authorities regulate the places of launch, land and recharge? (2) Will drones operate from commercial, municipally-owned ports at all, like airplanes do? Does it matter for purposes of liability whether they operate from official airports or someone’s back yard or the corner of a parking lot or remotely from wherever they are perched like from atop a streetlight? Should they be allowed to operate from anywhere? Can anyone stop them from doing

so? (3) Can local governments franchise drones as a source of local income? (4) How (if at all) does it matter whether drone flights are within the congressionally declared “navigable airspace?” (5) What are the privacy implications of drones? Do the latter differ significantly (either legally or factually) from potential privacy problems of satellites? Or piloted aircraft? How (if at all) does it matter whether the privacy intrusion is by a government agency or private citizens? (6) How does the prospect of numerous unmanned, but remote controlled, drones impact aviation safety? (7) Does constitutional takings law apply? (8) How about traditional tort law (e.g., trespass and nuisance)? Are property owners allowed (and, if so, how) to protect their property (and how high up does it go?) from trespassing drones? (9) Who is responsible for tort damages to persons or property? (10) With respect to takings, trespass, or nuisance, does it matter whether flights are directly overhead, *i.e.*, do we care whether the *clausum* got *fregit*¹⁸ or not? (11) And, generally, how do the United States Constitution First, Fourth, Fifth, and Fourteenth Amendments impact the discussion?

These questions are not written on a blank slate. There are basic ground rules that apply to piloted craft that will apply to unmanned aircraft, although the rules must be modified to reflect the different reality of drones. Nevertheless, there is no reason to think that the bad actors will not be punished, or that crimes will not still be crimes. The usual assortment of statutory and common law will apply to UAS. We simply have to think about how to do that without grounding the technology.

Basic Ground Rules

- (1) The FAA is responsible to establish the rules for airports and for flying machines. This includes the responsibility to establish the rules for UAS integration into the National Airspace System.¹⁹ The FAA “Unmanned Aircraft Systems Integration Office” is charged with facilitating this mission. FAA’s primary mission is to “provide the safest, most efficient aviation system in the world.”²⁰
- (2) Congress declared that there is not only something called the “navigable airspace of the United States” over which the United States has complete sovereignty,²¹ but declared generally that there is a public right of freedom of transit through this space.²² This navigable airspace is a part of but not the same thing as the National Airspace System into which UAS must be integrated. The federal power to ex-

ercise “complete and exclusive national sovereignty in the airspace of the United States”²³ extends “to grounded planes and airport runways.”²⁴

- (3) Notwithstanding federal sovereignty and the right of free transit in the federal navigable airspace, case law developed to establish that those whose land is beneath or near flight paths who are adversely affected by aircraft flight have property rights that are constitutionally protected²⁵ and personal rights that are protected by tort law.²⁶
- (4) When flights are by military aircraft, the responsibility for damage belongs to the federal government.²⁷ But when the offending aircraft are civilian, operating from civilian airports, then the responsibility is that of the airport operator (not, as you might suspect, the aircraft owner). This is because the airport is the party that chose where to establish the airport and how much land to acquire to buffer its neighbors.²⁸
- (5) The navigable airspace is generally speaking above 1,000 feet in urban areas and 500 feet in rural areas,²⁹ plus the airspace needed for taking off and landing.³⁰
- (6) Helicopters may operate at lower levels as long as they do so without hazard to persons or property below.³¹
- (7) The Congressional Research Service in April 2013³² succinctly explained that the “rest of the story” will take a while to iron out:

The legal issues * * * will likely remain unresolved until the civilian use of drones becomes more widespread. * * *. Once [FAA regulations are developed and] tested and promulgated, the unique legal challenges that could arise based on the operational differences between drones and already ubiquitous fixed-wing aircraft and helicopters may come into sharper focus.

Testing FAA’s Authority Over Commercial sUAS— Administrator v. Pirker³³

Answering the question of who or what agency is in charge of regulating UAS is not yet completely clear. No one disputes the general idea that the federal government regulates the airspace within which UAS in excess of 55 lbs. flies. However for sUAS—UAS weighing less than 55 lbs—the regulatory framework is less settled.

In October, 2011, a well-known and capable UAS enthusiast, Raphael Pirker (referred to in the indus-

try as “Trappy”), was hired to use his drone to take video of the University of Virginia campus. This footage found its way to YouTube.³⁴ The FAA did not like what it saw and it initiated its first enforcement action against a drone operator seeking a \$10,000 fine.

FAA claimed Pirker operated his drone recklessly. FAA never had a chance to explore factually whether that was so. Instead, and not surprisingly, Pirker filed a Motion to Dismiss the FAA’s complaint on the basis that the FAA has no authority to regulate, much less punish a person, for using a sUAS. After all, it had long been FAA’s position (remember 1981 Advisory Circular 91-57) that sUAS were not aircraft subject to FAA regulation; rather only to voluntary guidelines. On March 6, 2014, an ALJ for the National Transportation Safety Board agreed with Pirker and dismissed FAA’s complaint.³⁵

The ALJ determined that Pirker was not flying an “aircraft” but rather a “model aircraft” and that the FAA essentially waived its right to regulate model aircraft by its long standing position that these craft could operate without regulation (on the idea they were used by hobbyists and recreational users). The ALJ came to this conclusion because FAA had long treated model aircraft as a separate class of aerial machine and treated them as outside FAA’s authority. He saw no difference in FAA’s scope of authority simply because the model aircraft operator made a little money. The ALJ quipped that in order to agree with the FAA he would be required to find that “a flight in the air of a paper aircraft, or a toy balsa wood glider, could subject the operator to” FAA’s penalties. On April 7, 2014, the FAA appealed that ruling to the National Transportation Safety Board.³⁶ That appeal stays the effectiveness of the ALJ’s *Pirker* decision.

How much this dustup matters today is not entirely clear. The *Pirker* events predate FMRA. Recall that FMRA specifically reserves the FAA authority to enforce its rules against sUAS operators “who endanger the safety of the national airspace system.”³⁷ Given that in FMRA Congress says that FAA may enforce its rules against sUAS users, it is logical to assume that Congress meant FAA’s rules to be applied to sUAS users as well. FAA’s rules apply to aircraft, which would seem to mean that post-FMRA, the FAA is free to regulate sUAS except where Congress says otherwise. Therefore, the *Pirker* decision may have little bearing on the operations of sUAS in a post FMRA world.

Nevertheless, if it is ultimately decided that the FAA lacks authority over sUAS, then that means state and local governments will have fairly wide open authority to regulate them. Many states have enacted UAS

(including sUAS) laws. Some states, like Oregon, have specifically prohibited local governments from regulating drones, leaving all regulatory authority over drone ownership or operation to the state.³⁸ The extent of state and local government authority to enforce existing zoning rules regarding operation of UAS as aircraft and their take-off and landing venues as airports, remains to be seen. However, some states, again Oregon being an example, specifically allow the take-off, landing, and flying of model aircraft in certain zones and structures related to them so long as the structures are 500 square feet in floor area or less.³⁹

The Regulatory Roles of the FAA and State and Local Governments

Traditionally, the federal government has control over aircraft and where and how they fly. Federal law makes most aviation subjects expressly off limits to contrary local legislation. In this regard, the Federal Aviation Act declares that the United States possesses and exercises “complete and exclusive national sovereignty in the airspace of the United States.”⁴⁰ The FAA has broad authority to regulate the use of the navigable airspace, “in order to insure the safety of aircraft and the efficient utilization of such airspace” and “for the protection of persons and property on the ground * * *.”⁴¹ In *City of Burbank v. Lockheed Air Terminal, Inc.*, regarding safety and efficiency, the Supreme Court explained:

The interdependence of these factors requires a uniform and exclusive system of federal regulation if the congressional objectives underlying the Federal Aviation Act are to be fulfilled.⁴²

In another case, the Supreme Court explained in now antiquated terms FAA’s authority over aircraft:

Federal control is intensive and exclusive. Planes do not wander about in 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. The moment a ship taxis onto a runway it is caught up in an elaborate and detailed system of controls.⁴³

State and local governments have traditionally had authority and responsibility for airport siting to ensure compatible land uses around airports. On the other hand, state and local governments traditionally have only limited authority to restrict where, how and how often aircraft fly.

On the basis of federal preemption, courts have decided that state and local governments are foreclosed from regulating the placement or design of taxiways and runways⁴⁴ or surveillance radar at locations covered by or subject to FAA certification requirements.⁴⁵ However, state and local governments have successfully regulated the places where airports and heliports can be established so long as they don't interfere with safe aircraft operations or air traffic flow or regulations adopted by the FAA.⁴⁶ An existing FAA rule states that establishment of new airport is responsible for "compliance with any local law, ordinance or regulation * * *".⁴⁷ This rule defines "Airport" and "Heliport":

Airport means any airport, heliport, helistop, vertiport, gliderport, seaplane base, ultralight flightpark, manned balloon launching facility, or other aircraft landing or takeoff area.

Heliport means any landing or takeoff area intended for use by helicopters or other rotary wing type aircraft capable of vertical takeoff and landing profiles.⁴⁸

Obviously, UAS are different than traditional craft. Yet in the absence of UAS specific federal rules, the places UAS take off and land would seem, definitionally, to be "airports". UAS, especially sUAS, require no airport in the traditional sense of the term or special facilities. It is foreseeable that UAS will take off and land almost anywhere and fly in the airspaces above cars, and virtually any other area. This is what the Roadmap in fact seems to contemplate at least for sUAS.⁴⁹ Given how different UAS are, in its rulemaking FAA will likely leave room for state and local regulatory controls to affect the UAS experience including: (1) protection and enforcement of privacy, including the kind, and circumstances of, personal information collected, (2) authorization of some land use controls over places where certain types of UAS take off, land, recharge, and fly, and (3) franchise requirements for UAS operations. At least one court has held that aircraft (helicopters) owners and operators have no private property right to enter the navigable airspace of the United States from any particular private property site.⁵⁰

The federal Airline Deregulation Act of 1978 (ADA), which is an amendment to the Federal Aviation Act, as written will limit state or local controls over UAS in the absence of specific FAA rule clarification. The ADA provides that "a State * * * may not enact or enforce a law, regulation, or other provision having the force and effect of law related to price, route or service of any air carrier

that may provide air transportation under this subpart."⁵¹ The term "air carrier" is broad enough to include UAS:

Air Carrier — a person who undertakes directly by lease, or other arrangement, to engage in air transportation. ^[52] This includes an individual, firm, partnership, corporation, company, association, joint-stock association, governmental entity, and a trustee, receiver, assignee, or similar representative of such entities.⁵³

At least some commercial drones will likely be "air carriers".

United States Supreme Court cases in the context of traditional aircraft have generally assigned a preemptive role to the federal government over conflicting local regulation of aircraft and some aspects of airports. Thus, at issue in *City of Burbank v. Lockheed Air Terminal, Inc.* was a city ordinance prohibiting aircraft takeoff and landing during particular hours at a public airport (not owned by the regulating city) in order to regulate aircraft noise. In a 5-4 decision, the United States Supreme Court held the city ordinance was preempted by the comprehensive federal program regulating aircraft and aircraft flow generally. The majority of the Court explained that if such local laws were allowed to stand, that they would "severely limit the flexibility of the FAA in controlling air traffic flow." *Burbank* would seem to control and limit state and local regulation of UAS. That is unless the FAA carves out a role for state and local government in its UAS rulemaking.

The commerce clause source of the federal power over navigable airspace may provide some state and local regulatory wriggle room to regulate some aspects of UAS. In *Braniff Airways v. Nebraska Board of Equalization*, the Supreme Court has explained:

These federal [aviation] acts are bottomed on the commerce power of Congress, not on national ownership of the navigable airspace, as distinguished from sovereignty.⁵⁴

The court analogized Congress' interstate commerce power over navigable airspace to its power over navigable streams, pointing out that "the federal commerce power over navigable streams does not prevent state action consistent with that power."⁵⁵

Obviously, the division of regulatory authority between the federal, state and local governments is to be worked out. Yet, there are strong legal points of beginning for the discussion.

Privacy

Remarkably, Congress did not specifically include protection of privacy in the FAA's regulatory scope. This is so even though privacy is clearly on Congress' mind, as reflected in the following statement by Congressional Rep. Ed Markey:

Drones are already flying in U.S. airspace—with thousands more to come—but with no privacy protections or transparency measures in place. We are entering a brave new world, and just because a company soon will be able to register a drone license shouldn't mean that company can turn it into a cash register by selling consumer information. Currently, there are no privacy protections or guidelines and no way for the public to know who is flying drones, where, and why. The time to implement privacy protections is now.⁵⁶

In FAA's Roadmap and Comprehensive Plan, it explained that it would not promulgate specific privacy rules, but rather would leave privacy to others.⁵⁷ The FAA decided it would stick to what it does best: ensuring the safety of the friendly skies. On the same date as it issued the Roadmap and Comprehensive plan, FAA issued its privacy policy for UAS operations at the test sites, a policy reflecting this decision.⁵⁸ Essentially, the FAA privacy policy says that the FAA designated test sites must adopt specific privacy procedures and rules, allow public comment and annual review of those privacy rules, as well require all operators to follow "applicable privacy law" which can be state or local law or judicially decreed. The specifics of the privacy policies are left to be worked out at each site based on each site's needs and public comment received, as well as applicable laws.

Applicable laws are those that are written and those sure to come. Many states have specific privacy protections in place now. The constitution of the State of Washington, for example, provides: "No person shall be disturbed in his private affairs, or his home invaded, without authority of law."⁵⁹ Many states do not have specific protections for privacy but are considering them in anticipation of UAS integration.

Among privacy rules and strategies being considered are establishing limits on the scope of camera / microphone infiltration beyond a defined "fence." Theoretically, "fences" allow the operator to fly the UAS in a defined route with specific camera, microphone, and other parameters; if it strays outside of these parameters, an automated program kills the power and the UAS lands.

Others are requirements of height and distance from objects, places, and people not involved in operations or consenting; and requirements for "kill switches" to keep UAS' within their authorized purpose and geographic scope. Yet another privacy strategy is to require UAS owners and operators to enter into agreements with the federal government about how the UAS they control are operated and how private information obtained by drone is dealt with, and then including specified serious consequences for breach, including license revocation.

When these rules are not enough, existing legal principles will inform the privacy discussion. With respect to the paparazzi, the Supreme Court has held that the First Amendment does not authorize ridiculous access to news. Specifically, in *Zemel v. Rusk*, 381 U.S. 1, 16-17 (1965) the Supreme Court explained:

There are few restrictions on action which could not be clothed by ingenious argument in the garb of decreased data flow. For example, the prohibition of unauthorized entry into the White House diminishes the citizen's opportunities to gather information he might find relevant to his opinion of the way the country is being run, but that does not make entry into the White House a First Amendment right.

A case litigated in California a few years ago is also instructive. After all, California takes its coast, its celebrities, and its privacy seriously. It seems that one Adelman became concerned that unpermitted development might be taking place along the coast. He therefore decided to make a photographic record of what the coast looked like at that time, so that there would be hard evidence of any change. He embarked on a program of flying in a helicopter just offshore for the entire thousand mile length of California, taking more than 12,200 digital photos of virtually the entire coastal extent. He then posted the photos on line.⁶⁰ One of the standard paparazzi targets, Barbra Streisand, learned of the project and saw that his photos of her part of the coast showed her home clearly.⁶¹ She sued to stop him (and for \$50 million in damages). She lost. The court held that Adelman's overall project was in exercise of his right of free speech with regard to a matter of great public interest and importance (preservation of the coast, not photos of the Streisand home). Although Streisand also claimed a constitutional right,⁶² she was unable to convince the court that her reasonable expectation that no one would be able to see photos of her house was not undone, *inter alia*, by her consenting to interviews at the house (complete with photos).⁶³

The *Streisand/Adelman* case was probably fore-ordained because Adelman was not a paparazzo and had not set out merely to take photos of the homes of famous people. His goal was entirely different. As the trial court found, he was not attempting to photograph either Streisand or an event at her home, did not use a telephoto lens, and did not hover over or near her home, any of which might have presented a different picture. Indeed, the court went out of its way to contrast litigation involving a famous stalking of President Kennedy's widow that ended in issuance of an injunction against the photographer and enforcement of the injunction a decade later.⁶⁴

Search and seizure cases are also instructive. Casting the deciding vote determining that helicopter surveillance from 400 feet in the air and peering into a defective roof of an outbuilding at a person's home was not an unreasonable search and seizure, Justice Sandra Day O'Connor cautioned that:

Because the FAA has decided that helicopters can lawfully operate at virtually any altitude so long as they pose no safety hazard, it does not follow that the expectations of privacy "society is prepared to recognize as 'reasonable' simply mirror the FAA's safety concerns."⁶⁵

Her concurrence also established the majority view that FAA safety rules are not the equivalent of the legal privacy threshold.

In *California v. Ciraolo*,⁶⁶ police had a tip that the defendant was growing marijuana in his back yard. The back yard was shielded from street view by two layers of fences, a six foot outer layer and a ten foot inner layer. No question that the owner had an expectation of privacy from ground level for what the Court called "his unlawful agricultural pursuits." So the police went airborne. They went up in a small aircraft, flew over defendant's home *in the navigable airspace*, and took photos with "a standard 35mm camera." Then they got a search warrant.

The United States Supreme Court's *Ciraolo* opinion contains more discussion of "curtilage" than the authors have seen since law school, concluding (indeed, the state did not contest it) that the back yard was within the curtilage. But that was not the end of it. Was it reasonable for the defendant to believe that his yard was secure from observations by the naked eye? No. The Court concluded that either a passing aircraft or even "a power company repair mechanic on a pole overlooking the yard" could have seen the illicit crop.

The Court's conclusion was that "simple visual observations from a public space" (obviously including the navigable airspace) do not violate the 4th Amendment, even if they invade the curtilage.

In 2013, the Court revisited the curtilage issue in *Florida v. Jardines*.⁶⁷ This one involved a drug sniffing dog that was brought onto the front porch (within the curtilage) and allowed by his handlers to sniff at will until he indicated the presence of illegal drugs. Recalling its holding in *Ciraolo*, the Court noted both that the airborne observation was (1) from the navigable airspace and (2) "done in a physically nonintrusive manner." In *Jardines*, the police crossed the line. Perhaps a useful analogy for UAS purposes is in Justice Kagan's concurring opinion:

A stranger comes to the front door of your home carrying super high-powered binoculars.... He doesn't knock or say hello. Instead, he stands on the porch and uses the binoculars to peer through your windows, into your home's furthest corners. It doesn't take long (the binoculars are really very fine): In just a couple of minutes, his uncommon behavior allows him to learn details of your life you disclose to no one. Has your "visitor" trespassed on your property, exceeding the license you have granted to members of the public to, say, drop off the mail or distribute campaign flyers? ... Yes, he has."

Finally, *Kyllo v. United States*,⁶⁸ in a case involving police thermal imaging from a car on a public street, the United States Supreme Court found using sense-enhancing technology to obtain information about what is going on inside a home was an unlawful search and seizure. The four dissenting justices that saw nothing unconstitutional about the use of thermal imagery in a search of a dwelling from a car included Justices Stevens, O'Connor, and Kennedy. The majority of the United States Supreme Court, however, held that using technology enhancements "not in general public use"⁶⁹ in the context of obtaining information about the going on in a "private home, where privacy expectations are most heightened" is unlawful, citing *Dow Chemical v. United States*.⁷⁰ In *Dow Chemical*, the Supreme Court decided that technological perception enhancements were not an unlawful search and seizure of an *industrial complex*.

From these precedents we know there are certain analytical benchmarks to consider in the UAS context: (1) Being in the traditional navigable airspace matters. However, a majority of the Court is open to finding privacy violations in navigable airspace that would not

be generally expected by a homeowner. At this point in our history, people don't expect drones in and around their homes. That may change over time. (2) Information about the inside of a person's home from public rights of way (whether terrestrial or atmospheric) are unlawful if the means used to collect the information are not "in general public use." Thus the naked eye from 400 feet up and above is considered "in general public use;" high powered technology is not.⁷¹ (3) As a matter of federal law, journalistic targeting images of people in their homes using drones is likely to meet disfavor, at least in the short term. The *Streisand* court seemed impressed that the photographer was not targeting an individual home. On the other hand, *Ciraolo* was not concerned that the police were looking for a specific parcel of land based on a tip. How far journalists can go using drones to capture images of people conducting their private affairs will likely be among the most litigated UAS issues, at least in the near term.

Private Property Rights

Federal Rules about surface airspace to 500 feet

We've seen that privacy and private property rights are closely linked. There is another type of private property issue, however, to consider which depends on a closer look at "navigable airspace" and the "National Airspace System." The United States, through the FAA, controls the use of navigable airspace within the United States.⁷² The federal definition of navigable airspace refers to a component of the NAS: The term *navigable airspace* "means airspace above the minimum safe altitude of flight prescribed by the Secretary of Commerce * * *"⁷³ For winged aircraft that has generally meant airspace above 1,000 feet in urban areas and 500 feet in rural areas,⁷⁴ plus the airspace needed for taking off and landing.⁷⁵ Helicopters may operate at lower levels as long as they do so without hazard to persons or property below.⁷⁶ UAS on the other hand operate anywhere and everywhere, from the air at the surface to the highest reaches of the atmosphere. Importantly, because the pilot-in-command can be thousands of miles away, UAS depend not so much on navigable airspace, but on the National Airspace System.

The navigable airspace exists within the National Airspace System (NAS).⁷⁷ Regulation of the NAS is designed to protect persons and property on the ground, and to establish a safe and efficient airspace environment for civil, commercial, and military aviation.⁷⁸ In the Roadmap, the NAS is defined broadly:

National Airspace System (NAS): The common network of U.S. airspace—air navigation facilities, equipment, and services; airports or landing areas; aeronautical charts, information and services; rules, regulations, and procedures; technical information; and manpower and material.⁷⁹

At some point the law must wrestle with the scope of navigable airspace and how it links up with private property in the context of the NAS that the FAA controls. As a general matter, the FAA claims the right to regulate the NAS from the ground to near space. When the surface is privately owned the rules have some surprising twists.

The airspace controlled by the FAA is not recorded in any real property records. Yet there are circumstances in which the FAA claims to control airspace to the surface of private property. One such circumstance is "Special Use Airspace" or SUA (a confusing acronym for sure in the brave new world of UAS ubiquity). SUA is particularly problematic for private property owners, although they don't know it yet. The FAA purports to allow agencies to request and receive a designation of SUA at the surface of privately owned property, regardless of the fact that there is no recorded right to invade the private property to which the surface is attached. Such SUAs can be designated by the FAA merely on the finding that an agency claims that surface airspace existed in December 1, 1967.⁸⁰ The military in particular has in one situation relied on FAA's authority to designate SUA to designate "drone tracks" on private property per FAA's Order: "Procedures for handling Airspace Matters" Order JO 7400.2J 21-3-3 "SUA Proposals" "Proposal Content." In the military's view, regulating the surface of property to allow drone tracks is just like imposing a land use restriction limiting surface uses in more familiar contexts. The FAA order relied on says:

Proposals to designate the surface as the floor of a prohibited or restricted area *shall include a statement explaining how the proponent will exercise control of the underlying surface (i.e., by ownership, lease, or agreement with the property owner)*. Do not submit a copy of the deed, lease, or control agreement.

NOTE: *Restricted areas that were designated with the surface as the floor prior to December 1, 1967, are exempt from the "own, lease, or control" requirement.* The exemption status remains valid until amendment actions are taken which would expand the dimensions or times of use, or

change the designated purpose of the area.” (Emphasis supplied.)

* * *

Also from the same FAA Order, “Restricted Areas”
23-1-4. RESTRICTED AREA FLOOR

a. The restricted area floor may be established to the surface only when the using agency owns, leases, or by agreement, controls the underlying surface.

NOTE: *Existing restricted areas established from the surface before December 1, 1967, are exempt from the “own, lease, or control” requirement.* This remains valid until amendment action is taken which would expand the boundaries, altitudes, or times of use, or changes the designated purpose of the area. Nevertheless, using agencies of such restricted areas are encouraged to acquire sufficient control of the property to prevent possible disruption of that agency’s activities.” (Emphasis supplied.)

As a matter of property law there is nothing special about December 1, 1967. Nothing about that date, or any other date postdating statehood for that matter, changes the nature of private property rights or the rights of fee simple ownership to exclude others and control the land where the dog, the house, the play structure, the tractor etc, exists. But an unknown number of property owners may find the federal government weighing in on land use controversies to prevent larger structures on private property to protect airspace for UAS. They may also find themselves sharing what they thought was their outdoor private space with little flying machines they did not expect.

What the Courts have to Say About Private Property Rights

Congress declared the existence of navigable airspace and said that there is a right of freedom of transit through that space. The federal definition of navigable airspace is what the FAA says it is based on the safe flight altitude of aircraft. The safe flight altitude for drones is zero to the atmospheric altitudes of the Global Hawk. So the question is: can unmanned aircraft flying in the navigable airspace create liability for their owners or the operators of the places from which they operate? Under existing precedents the answer appears to be yes.

Since the end of World War II, there has been significant litigation between airports and their neighbors in an effort to apportion the “price of progress,” i.e., who

should foot the bill for the externalities discharged by a new and growing form of transport?⁸¹ What began with the Wright brothers and others with small vehicles in isolated fields was transformed by two World Wars and the civilian changes they engendered into a situation in which ever larger and ever louder and ever more nuisance-producing aircraft began operating in close proximity to people and other animals. The results were not always pretty.⁸² The uncontrolled noise and other nuisance-like byproducts of modern air transportation were untenable to those who lived nearby.⁸³ Noise was the primary issue and much was written about the problems caused by the interaction of flying machines and their neighbors for years thereafter.⁸⁴

The U.S. Supreme Court was an early participant in this litigation, issuing its seminal opinion in *United States v. Causby*, 328 U.S. 256, 258 (1946), shortly after World War II. *Causby* is the granddaddy of all the airspace taking cases. In *Causby*, the government claimed, among other things, a property owner does not own any airspace adjacent to the surface “which he has not subjected to possession by the erection of structures or other occupancy.” The Supreme Court in *Causby* rejected the government’s claim deciding that “the landowner owns at least as much space above the ground as he can occupy or use in connection with the land. The fact that he does not occupy it in a physical sense—by the erection of building and the like—is not material.” The court explained that the area around the surface of the ground was necessary to use and enjoy one’s property and invasions thereof and that these “are in the same category as invasions of the surface.”

In *Causby*, the government also argued that flights within navigable airspace are immune from taking liability. At the time, takeoffs and landings were not specifically designated as navigable airspace, but were a reasonably necessary part of it. The Court nevertheless concluded that “flights over private land are not a taking, unless they are so low and so frequent to be a direct and immediate interference with the enjoyment and use of the land.” The Court concluded that the flights at issue imposed a servitude similar to an easement that interfered with the use and enjoyment of the property. Although all economically beneficial use was not lost, there was a compensable diminution in the value of the property because the property could not be used for chicken farming as the owner intended.

The Court truly struggled with applying old and settled legal precepts to modern aircraft. But the majority found that the key to reconciling the rights of the public to fly and the underlying landowners to peaceful enjoy-

ment of property, was to require the public to compensate for property taken during the process. For better or worse, *Causby* involved flights that were both low and directly above the property. Both of those things would cause problems that would take time to straighten out, raising as they did the subsidiary questions of (1) what about higher flights? and (2) what about flights that are not directly overhead (i.e., which would not have been technical trespasses at common law)?

In *Griggs v. Allegheny County* 369 U.S. 84, 90 (1962), low flying aircraft, flying as allowed by FAA regulations, in navigable airspace, while taking off and landing at a public airport, constituted a compensable taking under the Fifth Amendment. This case relies on the Court's opinion in *Causby*.

In dicta, in *Braniff Airways v. Nebraska State Board of Equalization & Assessment*,⁸⁵ the United States Supreme Court summarized *Causby* to hold "that the owner of land might recover for a taking by national use of navigable air space, resulting in destruction in whole or in part of the usefulness of the land property."

It is worthwhile to talk about the liability of airports to understand the potential liability of UAS operators. In its two decisions discussed above, the Supreme Court made it reasonably clear that the navigable airspace was a *flight safety* concept, and not one that shielded airport operators from liability.⁸⁶ *Causby* involved military aircraft operating out of an air base in North Carolina during World War II. *Griggs* involved civilian aircraft operating out of a municipal airport in Pennsylvania. In each case, the aircraft were on approach to the airport when the noise and other noxious by-products adversely impacted property below (*Causby*) or near (*Griggs*) the flight path. There was a technical legal difference between the two cases, in that the navigable airspace definition at the time of *Causby* did not include the paths for landing and taking off. Congress amended the statute to add that between the decisions. But it didn't matter. In both cases, the Supreme Court held that the airport operator would be liable for a taking because of the adverse impact of the flights on the adjacent property owners. The idea seemed to be that the airport owners were the ones in the best position to adjust airport boundaries and create buffers.

In an early follow-up, the Court of Claims understood this to be a rule of general application.⁸⁷ It disregarded the fact that aircraft were operating in the navigable airspace and focused instead on the impact of those flights on underlying landowners:

it is clear that the Government's liability for a taking is not precluded merely because the flights of Government aircraft are in what Congress has declared to be navigable airspace and subject to its regulation.⁸⁸

The Court of Appeals for the Federal Circuit built on this holding a decade and a half later, noting that takings cases of all kinds "defy *per se* rules" and that the primary liability factor is noise, rather than direct physical intrusion.⁸⁹

Other courts, however, in search of a bright line, black letter rule, had placed a figurative fence on liability at the 500 foot mark in what the Federal Circuit dismissed as having been done in "more or less ... mechanical fashion."⁹⁰ All of this is fairly unsatisfying in answer to the question of UAS that fly at about the same elevation as an automobile and the airspace within which they fly will be within the definition of the "navigable airspace." This is where *Causby* will be helpful. Because no matter where a drone might fly in navigable airspace, if they cause nuisances to private property, they will very likely have liability under the taking clause of the Fifth Amendment if they are operated by a governmental operator. They will be exposed to nuisance and trespass damages if operated privately.

A second uncertainty in the lower courts dealt with the question whether, to establish liability, flights had to be directly over the plaintiff's property (i.e., constitute a classical trespass). This is essentially a federal problem, originating in a sharply divided 10th Circuit decision holding there could be no liability without trespass.⁹¹ Some federal courts follow this strict rule, while others follow the more pragmatic view in *Branning* and *Argent* that the damage is done by noise, vibrations, etc. and they do not follow strict rules of trespass.⁹² State courts have had no trouble following the pragmatic view, discarding repeatedly the notion that physical trespass is a necessary precondition for constitutional liability.⁹³

Simply put Congress, by statute, cannot likely limit the reach of the Fifth Amendment or the law of nuisance or trespass to 500 feet (or any other distance) above the ground. The issue, as in any takings case, is the impact of the governmental activity on the property owner. Altitude, standing alone, is no defense.⁹⁴ To date, the cases involving this concept have been fairly simple: military flights above or below 500 feet. All that will change with drones.

Bad Actors Will Still be Civilly and Criminally Liable for Bad Acts

Other laws, like United States Constitutional guarantees of due process, equal protection, laws about stalking and harassment, as well wiretapping will all continue to apply in the UAS future. Under the federal wiretap statute, it is unlawful to intentionally intercept an “oral communication” by a person “exhibiting an expectation that such communication is not subject to interception under circumstances justifying such expectation * * *.”⁹⁵ How these laws interface with the “navigable airspace” in the UAS context will take some time to be worked out. The manner in which we resolve the issue of where private property rights begin and where UAS navigable airspace begins will significantly inform the discussion.

Summary

In a short time, civil UASs will have a ubiquitous, legitimate place in U.S. airspace. UAS airspace rules will implicate the commercial rights of UAS operators, private property rights, and citizens’ privacy and safety values. All levels of government will be tasked to strike the balance between UAS deployment and these rights and values. Federal, state, and local authorities will be called upon to craft appropriate aviation, land use, and privacy rules that will support this important technology while protecting people and property from its effects. Attorneys will have a leading role to play to protect the UAS industry (both public and private), to protect clients affected by the UAS industry and to guide governmental entities in appropriate regulatory programs. In all cases, traditional legal concepts of real property, constitutional and administrative law will supply the fundamental analytical bases to ensure UAS technology is successfully deployed and can achieve broad public acceptance.

NOTES

1. This paper focuses on unmanned aerial systems, but the principles largely apply to all unmanned systems including those that are land- and marine-based, both of which are also well on their way to ubiquitous domestic application.
2. <http://robobees.seas.harvard.edu/>.
3. FAA Modernization and Reform Act of 2012 Sec. 332(b)(2).

4. Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap” (November 7, 2013).
5. <http://senseable.mit.edu/skycall/>; <http://www.seas.harvard.edu/news/2013/05/robotic-insects-make-first-controlled-flight>.
6. <http://www.tetracam.com/ProductHawkeyewindow2.htm>.
7. 72 Fed. Reg. 29 at 6689 (Feb 13, 2007)
8. http://www.faa.gov/about/initiatives/uas/uas_faq/#Qn3.
9. See FAA National Policy Order 8130.34A October 27, 2010 “Airworthiness Certification of Unmanned Aircraft Systems and Optionally Piloted Aircraft”; 72 Fed. Reg. 6689; see 14 C.F.R. §§ 21.191, 21.193 (experimental certificates); 14 C.F.R. § 91.319 (experimental certificate aircraft operating restrictions and requirements).
10. FMRA Sec 332(a)(1) and (a)(3).
11. FMRA Sec 332(a)(4).
12. Sec. 332(b)(2).
13. FAA Roadmap, p 43.
14. http://www.faa.gov/about/initiatives/uas/uas_faq/#Qn3.
15. FMRA § 332(c)(2).
16. FMRA Sec. 336(b).
17. The Economic Impact of Unmanned Aircraft Systems Integration in the United States. AUVSI March 2013. http://qzprod.files.wordpress.com/2013/03/econ_report_full2.pdf.
18. When a person wrongfully enters the real property of another.
19. FMRA Sec. 332.
20. FAA Roadmap p 4 (quoting FAA “Destination 2025”).
21. 49 USC 40103.
22. 49 USC 40101.
23. 49 U.S.C § 40103(a).
24. 14 C.F.R §§ 91.123 and 139.329.
25. *United States v. Causby*, 328 U.S. 256 (1946); *Griggs v. Allegheny County*, 369 U.S. 84 (1962); *Nestle v. City of Santa Monica*, 6 Cal.3d 920 (1972).
26. *Greater Westchester Homeowners Assn. v. City of Los Angeles*, 26 Cal.3d 86 (1979).

27. *Causby, supra*.
28. *Griggs, supra*; see also *Loma Portal Civic Club v. American Airlines, Inc.*, 61 Cal.2d 582 (1964) (cannot enjoin airlines from flying).
29. 14 C.F.R. §§ 91.119(b), 91.119(c).
30. 49 USC§ 40102(32).
31. 14 CFR § 91.119(d).
32. Alissa M. Dolan & Richard M. Thompson, II, *Integration Of Drones Into Domestic Airspace: Selected Legal Issues* (2013), *available at* <http://www.fas.org/sgp/crs/natsec/R42940.pdf>. (Congressional Research Service White Paper p 30.)
33. NTSB Docket CP-217 (July 18, 2013).
34. <https://www.youtube.com/watch?v=OZnJeuAja-4>.
35. <http://02b954f.netsolhost.com/docs/211088332-Pirker-Decision.pdf>.
36. National Transportation Safety Board Docket No. CP-217. <http://www.scribd.com/doc/218703115/Appeal-Brief-FAA-v-Pirker-April-7-2014>.
37. FMRA Sec. 336(b).
38. ORS 837.835 (2013).
39. ORS 215.883(1)(q).
40. 49 USC 1508(a).
41. 49 USC 1348(a) and (c).
42. 411 U.S. 624, 639 (1988).
43. *Northwest Airlines Inc., v. Minnesota*, 322 U.S. 292, 303 (1944); cited in *Burbank, supra*, 411 U.S. 633-34.
44. *City of Burbank v. Lockheed Air Terminal, Inc.*, 411 U.S. 624 (1973); *Burbank-Glendale-Pasadena v. City of Los Angeles*, 979 F.2d 1338, 1340 (9th Cir. 1992).
45. *United States v. City of Berkeley*, 735 F. Supp 937, 940 (E.D. Mo. 1990).
46. *American Airlines, Inc., v. Town of Hempstead*, 398 F.2d 369 (local noise rules preempted); *United States v. City of New Haven*, 367 F. Supp 1338 (1973) (state court cannot enjoin use of land acquired for airport runways or clear zones); *Garden State Farms v. Bay*, 390 A.2d 1177 (1978) (state had authority to prohibit “small relatively isolated privately owned helistops or heliports”).
47. 14 CFR 157.7.
48. 14 CFR 157.2.
49. FAA Roadmap 27.
50. *Air Pegasus of D.C. v. United States*, 424 F.3d 1206, 1218 (2005).
51. 49 U.S.C. § 41713(b).
52. Air transportation refers to the transportation of persons or property.
53. 14 CFR 139.
54. *Braniff Airways, Inc., v. Nebraska Board of Equalization*, 347 U.S. 590, 597 (1954).
55. *Id.*
56. “Markey Releases Discussion Draft of Drone Privacy and Transparency Legislation” (August 1, 2012), *available at* <http://markey.house.gov/press-release/markey-releases-discussion-draft-drone-privacy-and-transparency-legislation>,
57. CITE.
58. 14 CFR Part 9 Docket No. FAA-2013-0061 “Unmanned Aircraft System Test Site Program”. http://www.faa.gov/about/initiatives/uas/media/UAS_privacy_requirements.pdf.
59. Washington State Constitution Article I, Sec 7.
60. <http://www.californiacoastline.org>.
61. Of course it did. Coastal property owners tend to either hide their inland sides from prying eyes or make them totally nondescript, while opening toward the coast. Thus, anyone flying along the coast would see any coastal home clearly. And of course, the photographer labeled the photos “Streisand Estate, Malibu.”
62. The California Constitution contains a right of privacy. (Cal. Const., Art. I, § 1.)
63. The trial court’s extensive opinion (there was no appeal) is in *Streisand v. Adelman*, Los Angeles Superior Ct. no. SC 077 257 (Dec. 31, 2003). The opinion is copied on the californiacoastline website.
64. *Galella v. Onassis*, 487 F.2d 986 (2d Cir. 1973); *Galella v. Onassis*, 533 F. Supp. 1076 (S.D.N.Y. 1983).
65. 488 U.S. 445 (1989).
66. 476 U.S. 207 (1986).
67. 133 S.Ct. 1409 (2013).
68. 533 U.S. 27 (2001).
69. 533 U.S. at 34.
70. 476 U.S. 227, 237 n 4.
71. See also *Streisand* (no telephoto lens).

72. 49 USC 4103(b).
73. 49 USC 40102 (32).
74. 14 C.F.R. §§ 91.119(b), 91.119(c).
75. 49 USC § 40102(32).
76. 14 CFR § 91.119(d).
77. See for example, 49 USC 40102(a)(4)(F); 49 USC 40101(a)(6)(A); 49 USC 106(i)(2)(C); 49 USC 44505(b) (7) and (d)(1); GAO, *Air Traffic Control: Role of FAA's Modernization Program in Reducing Delays and Congestion*, GAO-01-725T (Washington, D.C.: May 10, 2001), and *National Airspace System: Long-Term Capacity Planning Needed Despite Recent Reduction in Flight Delays*, GAO-02-185 (Washington, D.C.: Dec. 14, 2001).
78. 49 USC 40103(b).
79. FAA Roadmap 8.
80. Order JO 7400.2J 21-3-3 "SUA Proposals" "Proposal Content."
81. The cases are chronicled in the articles cited *infra* at fn 84 and 85.
82. See, e.g., *Causby* (chickens committed suicide); *Wildwood Mink Ranch v. United States*, 218 F. Supp. 67 (D. Minn. 1963) (same re mink); *Sawyer v. United States*, 148 F. Supp. 877 (M.D. Ga. 1956) (mules bolted and injured farmer).
83. Michael M. Berger, *Nobody Loves An Airport*, 43 So. Calif. L. Rev. 631 (1970).
84. Jerold A. Fadem & Michael M. Berger, *A Noisy Airport Is A Damned Nuisance*, 3 Sw. U.L. Rev. 39 (1971); Michael M. Berger, *You Know I Can't Hear You When the Planes Are Flying*, 4 The Urban Lawyer 1 (1972); Michael M. Berger, *The California Supreme Court — A Shield Against Governmental Overreaching: Nestle v. City of Santa Monica*, 9 Cal. West. L. Rev. 199 (1973); Michael M. Berger, *Airport Operator Liability: Continuing Liability for Continuous Tortfeasors*, 9 L.A. Lawyer 27 (Dec. 1986); Michael M. Berger, *Airport Noise in the 1980s: It's Time for Airport Operators to Acknowledge the Injury They Inflict On Neighbors*, 1987 Institute On Planning, Zoning, and Eminent Domain, ch. 10 (S.W. Legal Foundation).
85. *Supra*, 347 U.S. 590 (1954).
86. See *Causby*, *Griggs*.
87. The cases in this genre are all from the Court of Federal Claims (or its predecessor) and the Court of Appeals for the Federal Circuit, as the flights that raise this issue have been military training flights where landowners have been subjected to repeated overflights by substantial numbers of aircraft practicing takeoffs and landings via touch-and-go maneuvers or practicing landing on aircraft carriers by using a spot marked out on the desert floor. Some of this activity takes place above 500 feet. Cases involving civilian airports all involve takeoffs and landings and are thus in the portion of the navigable airspace below 500 feet that had already been held to be their responsibility in *Griggs*.
88. *Branning v. United States*, 654 F.2d 88, 99 (Ct. Cl. 1981).
89. *Argent v. United States*, 124 F.3d 1277, 1282 (Fed. Cir. 1997).
90. *Id.* at 1281, citing, e.g., *Lacy v. United States*, 595 F.2d 614, 616 (Ct. Cl. 1979); *Aaron v. United States*, 311 F.2d 798, 801 (Ct. Cl. 1963).
91. *Batten v. United States*, 306 F.2d 580 (10th Cir. 1962).
92. Compare *Branning* and *Argent* with *Stephens v. United States*, 11 Ct. Cl. 352, 358 (Ct. Cl. 1986) (presumption of non-taking); *Persyn v. United States*, 34 Fed. Cl. 187, 195 (Ct. Cl. 1998) (calling *Branning* "a very limited exception").
93. E.g., *Thornburg v. Port of Portland*, 376 P.2d 100 (Or. 1962); *Martin v. Port of Seattle*, 391 P.2d 540 (Wash. 1964); *City of Jacksonville v. Schumann*, 199 So. 2d 727 (Fla. 1967).
94. *Branning v. United States*, 654 F.2d 88, 998-99 (Ct. Cl. 1981).
95. 18 U.S.C. §2511(1)(a); 18 U.S.C. §2510(2).