AMERICAN BAR ASSOCIATION

2015 ABA Annual Meeting

FEDERAL LAWS, REGULATIONS, AND PROGRAMS AFFECTING LOCAL LAND USE DECISION-MAKING

DRONES

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July 30th, 2015

Chicago, Illinois

Land and Airspace Rights in the Era of Small Drones[1]

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Unmanned Aircraft aka "drones" are entering the "National Airspace System" or "NAS" above every town in ever greater numbers. They come in all shapes and sizes, but the greatest growth is expected for small aerial machines flying at 500 ft. AGL or less. Most drones will fly at 40 feet AGL and less. These aerial robots fly in Federal Aviation Administration (FAA) declared "navigable airspace." "Navigable airspace" is not recorded in any real property records and is simply located where the FAA says it is by rule and aerial navigation charts. For small drones, the typical "navigable airspace" will be far closer to the surface than ever contemplated for manned aircraft. As a consequence, all but forgotten principles of federal constitutional law defining the rights at the intersection of navigable airspace and private property; legal principles established in the early days of aviation, are relevant.[3] Cases defining expectations of privacy in antiquated places like public phone booths, play a role in the drone related privacy issues involving cutting edge drone technology.[4] Legal analyses developed under the United States Constitution's prohibition on unreasonable searches and seizures, will shape not only how law enforcement uses drones, but also will provide key constitutional privacy principles.[5]

Thus, as is always the case with new technology, the law will be tasked to "catch up," by making sense of old precedents and establishing new ones to balance individual rights with needs for technological innovation. This paper outlines the legal precedents that guide how that balance may be struck for commercial drones in navigable airspace.

Making Room in the National Airspace System for Drones

Congress and FAA Have Acted

[1]This paper draws from and updates Wendie Kellington and Michael Berger: "Why Land Use Lawyers Care About the Law of Unmanned Systems", Zoning and Planning Law Report, June 2014.

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[3] *United States v. Causby*, 328 U.S. 256 (1946).

[4] Katz v. US, 389 U.S. 347 (1967).

[5] The Fourth Amendment to the U.S. Constitution states:

"The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized." *See Florida v. Riley*, 488 US 445, 452 (1989); *California v. Ciraolo*, 476 U.S. 207 (1986); *Florida v. Jardines*, 133 S.Ct. 1409 (2013); *Kyllo v. United States*, 533 U.S. 27 (2001); *and see Roe v. Wade*, 410 U.S. 113 (1973) (This right of privacy, whether it be founded in the Fourteenth Amendment's concept of personal liberty and restrictions upon state action, as we feel it is, or, as the District Court determined, in the Ninth Amendment's reservation of rights to the people, is broad enough to encompass a woman's decision whether or not to terminate her pregnancy...")

In the "FAA Modernization and Reform Act of 2012"[6] or "FMRA", Congress required the FAA to develop a plan to integrate Unmanned Aerial Systems (UAS), commonly called "drones", into the NAS, by 2015. In November 2013, FAA published a "Roadmap"[7] and a "Comprehensive Plan[8]" for drone integration into the NAS. In December 2013, per FMRA's command, the FAA designed six test ranges for testing drones as a prelude to their integration into the NAS.[9]

Since FMRA's adoption, the FAA has issued hundreds of public agency "Certificates of Authorizations" or "COAs" for public drone flights all over the United States for purposes ranging from GIS mapping, law enforcement, forest fire detection, border patrol, search and rescue to agricultural research and more.[10] Since September, 2014, the FAA has issued hundreds of FMRA Section 333 "exemptions[11]" to enable small commercial drones to be deployed for all manner of commercial purposes – from evaluating insurance claims, to infrastructure inspection, photography and filmmaking, and agriculture, to name a few. FAA is currently considering hundreds more requests for other types of "Section 333" exemptions and many of those are expected to be approved soon. The online retailer, Amazon, is among those that have submitted Section 333 exemption applications to fly small drones for research and development flights to work out how to deliver packages weighing 5 lbs or less –which is 86% of Amazon's business.[12] On March 19, 2015, FAA approved Amazon Logistics LLC's request for an "Experimental Airworthiness Certificate" to enable Amazon to test its drone delivery model.

On April 9, 2015, FAA announced it would expedite Section 333 approval applications that were substantially similar to ones already approved by the agency and if so to issue "summary grants" as well as to issue "Blanket Certificates of Authorization" so long as drone flights are performed by operators holding Section 333 exemptions, within the operators "visual line of sight, so long as the flight stays certain distances from airports, occurs during daylight hours at or below 200 feet, and uses drones weighing 55 lbs. or less.[13]

On February 23, 2015, FAA issued a "Notice of Proposed Rulemaking" (NPRM) that will allow drones weighing less than 55 pounds, to fly in the NAS under certain conditions and

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[6] FAA Modernization and Reform Act of 2012, Public Law 112-95 Feb 14, 2012.
[7] "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace System (NAS) Roadmap"
[8] "Unmanned Aircraft Systems (UAS) Comprehensive Plan) for UAS Integration."
[9] Six states were awarded the right to establish and manage unmanned aerial systems ranges spanning nine states. The University of Alaska at Fairbanks administers the Pan Pacific Range which is composed of areas of Alaska, Oregon and Hawaii. Oregon has three test sites within the Pan Pacific range that spans much of the state. Virginia Tech has ranges in Virginia and New Jersey, and there are FAA designated test ranges in Nevada, New York, Texas and North Dakota.
[10] In 2012, when FMRA was adopted, FAA issued 257 public COAs. By the end of 214, FAA had issued 609 public COAs and many more than that will be issued in 2015.
https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=18297
[11]This refers to Section 333 of FMRA, which authorizes the FAA to exempt UAS from traditional aircraft requirements because "as a result of their size, weight, speed, operational compatibility, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security." FMRA Sec. 333(b)(1).
[12] http://www.regulations.gov/#!documentDetail;D=FAA-2014-0474-0001
[13] https://www.faa.gov/news/updates/?newsId=82485

constraints.[14] When the NPRM becomes a final rule (sometime at the end of 2016 or early 2017), using drones in private sector commercial operations will be simple, normative and relatively inexpensive.

The U.S. is Playing Catch Up

The world has long used civilian drones and is planning for more. Japan has used drones in agriculture for more than 20 years. In Germany, mail is delivered to the German island of Juist using drones.[15] Canada and Australia deploy drones for a variety of purposes. Many other countries have deployed commercial and civil service and commercial drones for many years and are aggressively planning on more to come. Among western nations, the United States is well behind in the deployment of this commercial drone technology.

Congress is interested in accelerating the pace of catching up. The industry is clamoring to lawfully enter the United States aerial robotics marketplace. With the strong regulatory, political and commercial forces driving United States aerial drone integration, it is clear that drones are here and more are coming.

The National Airspace System, Navigable Airspace and Federal Preemption

The federal government is in charge of the National Airspace System or "NAS". The NAS is broadly defined:

> "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."[16]

Within the above defined NAS, Congress declared that there is something called the "navigable airspace of the United States" over which the United States has complete sovereignty,[17] and that there is a public right of freedom of transit through this space.[18] Thus, navigable airspace is a part of, but not the same thing as, the NAS into which UAS must be integrated. The navigable airspace is, generally speaking 1,000 feet above the tallest structure in urban areas, 500 feet from any person, vessel, vehicle, and structure in sparsely populated areas, and 500 feet AGL in unpopulated areas,[19] plus the airspace needed for taking off and landing. [20] Manned helicopters have long been authorized to operate at lower levels as long as they do so

[14] https://www.faa.gov/regulations_policies/rulemaking/recently_published/media/2120-AJ60_NPRM_2-15-2015_joint_signature.pdf
[15] http://www.reuters.com/article/2014/09/24/us-deutsche-post-drones-idUSKCN0HJ1ED20140924
[16] FAA Roadmap 8.
[17] 49 USC 40103
[18] 49 USC 40101
[19] 14 C.F.R. §§ 91.119(b), 91.119(c).
[20] 49 USC§ 40102(32).

without hazard to persons or property below.[21] But with drones, navigable airspace is 500 feet and below and includes flights 200 feet AGL and below.[22]

The federal power to exercise "complete and exclusive national sovereignty in the airspace of the United States"[23] extends "to grounded planes and airport runways."[24] 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 * * *."[25] 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."[26]

In another case, the Supreme Court reinforced the primacy of FAA's authority over aircraft and where they fly:

> "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."[27]

Preemption is based in the Supremacy Clause of the Constitution, which states, "This Constitution, and the Laws of the United States which shall be made in Pursuance thereof * * * shall be the Supreme Law of the land." U.S. Const., art. VI, cl. 2. State and local laws or claims have been interpreted to be preempted under this clause in one of three ways: "express" preemption, "field" preemption and "conflict" preemption. *Boomer v. AT & T Corp.*, 309 F.3d 404, 417 (7th Cir., 2002). These three types of preemption are well explained in *Hoagland v. Town of Clear Lake*, 415 F.3d 693 (2005):[28]

> "Express preemption occurs when a federal statute explicitly states that it overrides state or local law. Conflict preemption exists if it would be impossible for a party to comply with both local and federal requirements or where local law 'stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress.' *Freightliner Corp. v. Myrick*, 514 U.S. 280, 287, 115 S.Ct. 1483, 131 L.Ed.2d 385 (1995) (quoting *Hines v. Davidowitz*, 312 U.S. 52, 67, 61 S.Ct. 399, 85 L.Ed. 581 (1941)). Field preemption occurs when federal law so thoroughly 'occupies a legislative field' as to make it reasonable to infer

[21] 14 CFR § 91.119(d).
[22] https://www.faa.gov/news/updates/?newsId=82245
[23] 49 U.S.C § 40103(a)
[24] 14 C.F.R §§ 91.123 and 139.329
[25] 49 USC 1348(a) and (c).
[26] 411 U.S. 624, 639 (1988).
[27] *Northwest Airlines Inc., v. Minnesota*, 322 U.S. 292, 303 (1944); *cited in Burbank, supra*, 411 U.S. 633-34.
[28] *See also Hodges v. Delta Airlines, Inc.*, 44 F.3d 334, 335 n 1 (5th Cir. 1995) (*en banc*); *see Morales v. Trans World Airlines, Inc.*, 504 U.S. 374, 385, 388 (1992).

that Congress left no room for the states to act. *Cipollone v. Liggett Group, Inc.*, 505 U.S. 504, 516, 112 S.Ct. 2608, 120 L.Ed.2d 407 (1992)."

All three types can be invoked in the context of state or local regulations affecting aircraft and navigable airspace. As the *Boomer* Court explained:

> "These include noise regulation ordinances and flight pattern controls. In *City of Burbank v. Lockheed Air Terminal*, 411 U.S. 624, 93 S.Ct. 1854, 36 L.Ed.2d 547 (1973), the Supreme Court determined that in light of the pervasive nature of the scheme of federal regulation of aircraft noise, as evidenced by the Noise Control Act of 1972, the FAA and the Environmental Protection Agency had full control over airport noise, preempting local control. The Court of Appeals for the Eleventh Circuit followed suit in *Pirolo v. City of Clearwater*, 711 F.2d 1006 (11th Cir.1983), finding that local ordinances prohibiting night operations and proscribing air traffic patterns were preempted. The Court of Appeals for the Ninth Circuit found that curfews on aircraft flights were preempted in *San Diego Unified Port Dist. v. Gianturco*, 651 F.2d 1306 (9th Cir.1981).
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> "In *Abdullah v. American Airlines, Inc.*, 181 F.3d 363 (3d Cir.1999), the court found air safety regulations preempted. And a state statute requiring drug testing of pilots was found to be preempted in *French v. Pan Am Express, Inc.*, 869 F.2d 1 (1st Cir.1989).
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> "*These cases have one thing in common. They involve issues which reach far beyond a single local jurisdiction and which cannot sensibly be resolved by a patchwork of local regulations. It would be unmanageable — say nothing of terrifying — to have local control of flight routes or of flight times. Such things require nationwide coordination. * * *.*" (Emphases supplied.)

Cases are fairly uniform on the types of aviation related state and local regulations that are not preempted by federal law. Land use regulations affecting aviation have generally survived preemption challenges. For example, the location of airports has long been viewed as a local land use matter that FAA consults on, but does not ultimately control. 14 CFR Sec. 157(7)(a) (FAA consultative role excludes land use)[29]; *and see* 49 USC Sec 40101-50105 (FAA consultation with EPA concerning the location of certain proposed larger airports). In *Gustafson v. City of Lake Angelus*, 76 F.3d 778, 783 (6th Cir. 1996), a city ordinance prohibited landing seaplanes on lake. A seaplane operator claimed the restriction was preempted by federal law that authorized the lake landings. On review, the court determined that the city regulation prohibiting the seaplane landings was not preempted by federal law:

> "[W]e believe the United States' sovereign regulation of the airspace over the United States and the regulation of aircraft in flight is distinguishable from the regulation

[29] Airport construction or deactivation "does not relieve the proponent of responsibility for compliance with any local law, ordinance or regulation, or state or other [f]ederal regulation. Aeronautical studies and determinations will not consider environmental or land use compatibility impacts."

of the designation of plane landing sites, which involves local control of land (or, in the present case, water) use."

In Re Commercial Airfield, 752 A.2d 13, (Vermont 2000), a crop dusting operation in rural Vermont expanded without first obtaining governmental permits. State authorities demanded the owner apply for state permits and the operator refused, instead filing litigation claiming the local permitting requirements were preempted by federal law. The court disagreed. The court held that "the federal government has not pervasively occupied the field of land-use regulations relating to aviation" joining Ohio courts in distinguishing the way the 9th Circuit views federal authority over aviation related activities:

> "Appellant relies most heavily on a Ninth Circuit case where the court held that federal law preempted a city ordinance that attempted to govern a runway expansion project. *See Burbank-Glendale-Pasadena Airport Authority, Inc. v. City of Los Angeles*, 979 F.2d 1338, 1341 (9th Cir. 1992). Appellant argues that this case is analogous to his situation because it illustrates that federal laws have preempted expansion projects at established airports. The case more accurately shows that the FAA is primarily involved with safety and airspace issues. The Ninth Circuit accepted the lower court's determination that the runway expansion would improve safety and reduce aircraft noise. *See Id.* at 1339. As previously stated, the FAA has authority over air safety concerns and aircraft noise regulations. *See City of Burbank*, 411 U.S. at 627, 93 S.Ct. 1854. Thus, the court found that the regulation, which attempted to interfere with the movements and operation of aircraft, was preempted. Because Act 250 is concerned with environmental and land-use issues, *Glendale-Pasadena* does not offer a relevant analogy.
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> "In addition, we find the *Ninth Circuit's cursory review of the preemption issue unhelpful in this situation and decline to follow their holding*. Cf. *City of Cleveland v. City of Brook Park*, 893 F.Supp. 742, 751 (N.D. Ohio 1995) (*Ninth Circuit's 'view of the scope of the Aviation Act is simply broader than that implied in any reasonable reading of the statute*.')" (Emphases supplied.)

State and local government have long used their police power, including zoning power, to protect the quiet of public parks, views and vistas, and neighborhoods. How this police power will intersect with federal regulatory authority over the NAS and flying machines is yet unknown. However, a hint came in June, 2015, when FAA updated its UAS "FAQ" website to address the issue, stating simply:

> "**Which governs the airspace over my property – FAA regulations or local/state laws about unmanned aircraft systems (UAS)?**
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> "Under 49 United States Code 40103, the United States Government has exclusive sovereignty of airspace of the United States and the FAA has the authority to prescribe air traffic regulations on the flight of aircraft, including UAS. Whether Federal law preempts state or local requirements for UAS depends on the precise nature of those requirements. The Department of Transportation evaluates these

> laws or requirements on a case-by-case basis to make sure they don't conflict with FAA's authority to provide safe and efficient use of U.S. airspace." https://www.faa.gov/uas/faq/

Another glimpse into how the FAA views its authority in the context of state regulatory, is in a recent letter from the Department of Transportation General Counsel. Specifically, in a letter dated April 2015, the Federal Department of Transportation General Counsel wrote an opinion letter (attached) that explains the State of Colorado is prohibited from refusing an air ambulance company to enter the state unless it had a Colorado air ambulance license. The letter contains the following passage:

> "With respect to field preemption, 49 U.S.C. section 40103(a)(b) directs the FAA to 'develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace.' This provision, implemented by comprehensive FAA regulations, establishes a pervasive and exclusive Federal regime over the management and use of the navigable airspace, and aviation safety, noise, and aircraft operations. * * *"

These broad principles of preemption must be reconciled with other constitutional principles implicating property rights and privacy which state and local governments are empowered to protect. It will be up to the courts to create the appropriate roadmap governing legal rights of those affected by and flying low altitude drone flights.

Accordingly, reasonable state laws that beef up or retain state law nuisance and trespass claims in the context of drones (or any other potentially invasive technology) will likely survive preemption challenges even if they clip the wings of commercial activity. Governmental entities that establish takeoff and landing sites for "airports" may well have exposure for "taking" private property in the context of repeated nuisance activities allowed by the location of such "airports" under local regulations. Private landowner state nuisance or trespass claims against drone operators (or the operators of other types of potentially invasive technologies) will be resolved on particular facts – a drone that hovers above private property in a way most would find harassing is more likely to face exposure to liability, while the drone that flies over at speed from one destination to the next without collecting, or at least without retaining, personal data and flies consistently with FAA rules likely will escape liability on the merits or preemption grounds.

The only reasonably clear preemption lines in this context are that: (1) state and local governments are not preempted from imposing restrictions on their own governmental use of drones, (2) governmental land use regulations that control where drone "airports" exist or where "airports" are prohibited, are not preempted (so long as take offs and landings are reasonably allowed somewhere), (3) drone flights in public rights of ways and on purchased avigation easements acquired from landowners (harken back to establishing the interstate highway systems) for drone routes will avoid liability for trespass and nuisance for activities within those easement / right of way routes. The caveat being that avigation easements must be broad enough to encompass the totality of the public and private nuisance effects of constant low altitude overflights. Further, (4) drones delivering packages to, or providing services at, particular locales will be neither nuisances nor trespasses, but rather are authorized under the

law related to "invitees" and licensees". And, finally, (5) unauthorized surveillance and personal data gathering may be regulated and punished by state and local governments. Defenses to the latter is not federal aviation preemption, but rather Federal Constitutional First Amendment or parallel type defense to gather news.

Altitude is No Defense –Unconstitutional Taking of Private Property and Liability for Nuisance and Trespass

Use of airspace, even navigable airspace, can expose the aircraft operator, or the owner or operator of the airport from which aircraft take off and land, to liability. Liability generally breaks down into three categories: (1) for government, unconstitutional taking liability under the Fifth Amendment to the United States Constitution and similar state constitutional provisions, (2) government and private operators can be liable for trespass, and (3) government and private operators can be liable under the law of nuisance to adversely affected owners or occupants of property. Each are explored in more depth below.

Governmental Liability – Unconstitutional Taking of Private Property

The Fifth Amendment to the United States Constitution provides the following relevant restriction on governmental actors:

"…nor shall private property be taken for public use, without just compensation"

Governmental actors can be liable under the Fifth Amendment as operators, airport owners, airport operators, or regulators.

The interests protected by the Fifth Amendment are private property rights: but what are the private property rights in navigable airspace?

The Supreme Court in *Causby v. United States*, 328 U.S. 256, 264, explained that property owners have protected private property ownership interests in the "immediate reaches of the enveloping atmosphere" and explained:

> "Otherwise buildings could not be erected, trees could not be planted, and even fences could not be run. The principle is recognized when the law gives a remedy in case overhanging structures are erected on adjoining land …"

The Supreme Court acknowledged that the scope of private property rights in the navigable airspace has not been decided:

> "The airspace, apart from the immediate reaches above the land, is part of the public domain. We need not determine at this time what those precise limits are…"[30]

Nevertheless, the judicial pronouncements of the private interests protected by the Fifth Amendment are informative of the scope of that protection.

Accordingly, in *Causby,* the Supreme Court characterized untenable impacts from low

[30] *U.S v. Causby, 328 U.S. at 266.*

flying aircraft flights that diminish the potential uses of an owner's land as a compensable taking of private property. The Court decided that governmental *airspace* intrusions are an unconstitutional taking because, at least in part, they take away valuable *land* rights by making real property unavailable in whole or part for the purposes to which the owner intends to put the land.

Causby deserves close attention. The *Causby* property owner was a chicken farmer. The frequent low flying aircraft take offs and landings were so noisy that they caused the chickens to pile atop one another and suffocate. The flights were constant. The family was unable to sleep in their farmhouse. Their grandchild was kept awake at night. They worried for their safety if an airplane might crash into their home. *Causby* sued the government for an unconstitutional taking[31] of his property without compensation, because it was impossible for him to use the property for a chicken farm or a residence. The government argued that flights within navigable airspace are immune from taking liability. The Court disagreed and 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*." (Emphasis supplied.) The Court decided that the flights had 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. Lower courts applied the *Causby* analysis to protect private property rights. *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).

The Supreme Court characterized the land interest that the flight of aircraft "takes" in these circumstances to be an "easement of flight".

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 United States Constitution Fifth Amendment. *Griggs* also relies on the Court's opinion in *Causby*. In dicta, in *Braniff Airways v. Nebraska State Board of Equalization & Assessment*,[32] 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."

Similarly, in *Thornburg v. Port of Portland*, 233 Or. 178, 193-94 (1963), the Oregon Supreme court relied on federal precedents to hold that when the government conducts *or permits* an activity for public purposes upon its land that is sufficiently invasive to amount to a taking of adjacent land, an action for inverse condemnation lies against the government.

Where the taking alleged is not complete, a partial taking claim is possible. Thus, it was the "taking" of airspace rights, and not the totality of the property or the underlying building, that was at issue in a well-known unconstitutional taking law case - *Penn Central Transp. Co. v. New York City*, 438 US 104 (1978). In *Penn Central*, the Supreme Court explained that partial taking

[31] Under the Fifth Amendment to the United States Constitution, which states in relevant part: "nor shall private property be taken for public use, without just compensation."
[32] 347 U.S. 590 (1954).

claims were possible, albeit in that particular case no taking was found. Specifically, in *Penn Central*, the private property owner argued that a historic landmark designation imposed on its private property took its valuable airspace rights above Grand Central Station terminal. At the time the landmark law was imposed, the property owner had the right to add 20 stories atop the existing Grand Central Station building. The right to construct all 20 stories was lost under the disputed regulation. The court determined the prohibition on the vertical addition to the structure did not constitute a "taking" of the airspace rights after examining the (1) economic impact of the regulation, (2) the distinct investment backed expectations of the landowner, and (3) the character of the governmental action. The court decided there was no taking in that case explaining:

> "A 'taking' may more readily be found when the interference with property can be characterized as a physical invasion by government, *see, e. g., United States v. Causby*, 328 U.S. 256 (1946), than when interference arises from some public program adjusting the benefits and burdens of economic life to promote the common good.
>
> "'Government hardly could go on if to some extent values incident to property could not be diminished without paying for every such change in the general law,' *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 413 (1922), and this Court has accordingly recognized, in a wide variety of contexts, that government may execute laws or programs that adversely affect recognized economic values." (Citations omitted.)

The *Penn Central* analysis that holds a partial taking is possible, was reinforced in *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001). *Palazzolo* is important because it diminished the importance of physical invasion to the analysis and reinforces that partial taking claims can happen. In *Palazzolo*, the Supreme Court explained that each element of a *Penn Central* partial taking claim was distinct and that a taking claim could not be dismissed merely because the regulation had been imposed before the property owner acquired their property.

In the context of drones, it is imaginable that areas of downtown landscapes across the country could be designated air routes for low flying drones. If such designations are not acquired by avigation easements, then the taking question is raised. Whether such designations that foreclose vertical additions to buildings in whole or part would constitute a taking, will depend upon the facts of each particular case. The point, however, is that the fact an alleged taking occurs at altitude alone, cannot be relied on as a defense.

Trespass

A person is liable for private trespass when they enter property belonging to another without permission. In this regard, the Restatement (Second) of Torts § 159 (1965) restates the following regarding public and private liability for trespass:

> (2) Flight by aircraft in the air space above the land of another is a trespass if, but only if, (a) it enters into the immediate reaches of the air space next to the land, and (b) it interferes substantially with the other's use and enjoyment of his land.

Further, under many state statutes, criminal trespass occurs when a person reenters real property belonging to another after having been asked to leave.

At common law, "ownership of the land extended to the periphery of the universe * * *". *United States v. Causby, supra* 328 U.S. 256, 260-261. However, the practical realities of air travel caused the United States Supreme Court in *Causby* to abandon this common law principle and apply more limited rights private property rights to airspace, recognizing that the air above private property had become a public highway. The court explained that to hold otherwise would mean "every transcontinental flight would subject the operator to countless trespass suits. Common sense revolts at the idea. * * *." *Causby, supra* 328 U.S. 261. Instead, the *Causby* court redefined private property in terms of what of what a property an owner can use and the significance of the interference with that use imposed by a trespasser/invader. But Causby and the cases that follow it, supply no bright lines about where private property ownership ends, and public rights to the airspace highway begins. In the context of small drones where the airspace public highway seeks to be at 200 or even 40 feet, the *Causby* principle of private ownership of airspace will be mightily tested.

Clearly, to establish trespass, it is essential to determine the location of the private property and the rights therein that are alleged to be interfered with. *Causb*y and cases following it teaches that the limits of private property are informed by state law. In other words, the uses allowed by state law that may be interfered with by low flying drones, are relevant to decide what has been taken from a private property owner. There can be little question but that to allege a trespass, the plaintiff must identify some interference with the use or enjoyment of his land to prevail. The Supreme Court precedents establish some benchmarks to consider in identifying private property in the context of trespass claims by low flying drones:

- *Causby,* defines private property rights in airspace as: "at least as much of the space above the ground as [the owner] can occupy or use in connection with the land"; the "immediate reaches of the enveloping atmosphere" and that to avoid liability a defendant must not impose a "direct and immediate interference with the enjoyment and use of the land."
- *Florida v. Riley,* defines private rights in airspace as*:* "normal use of the greenhouse or of other parts of the curtilage."
- *Jardines,* defines private rights in airspace as*:* "an area belonging to [defendant] and immediately surrounding his house - in the curtilage of the house, which we have held enjoys protection as part of the home itself."
- *Penn Central,* presumed that airspace in which buildings could be erected was private property. The question was whether the interference rose to the level of a taking, but the court was clear a property right in 20 stories had been interfered with.[33]

[33] The Court decided the interference was not an unconstitutional taking based on the particular facts at issue, and so there was no liability.

In some states, it may be a defense to a private trespass claim that the aircraft operator flies in FAA declared navigable airspace. In *Jacobson v. Crown Zellerbach Corp*.[34], the Oregon Supreme Court decided in the context of a private *nuisance* claim that "public policy dictates that no cause of action lies against an individual member of the public who uses the public way for travel *in conformance with the rules laid down therefore*." However, logically, it seems that if low flying aircraft fly into the area of property that the constitution recognizes as private property, and substantially interferes with the use and enjoyment of that property per the Restatement, then no state statute could relieve the owner of liability for trespass onto that private property. At least that is, without exposing the state promulgating such a statute, to taking liability.

Nuisance

Nuisance liability does not depend upon an aircraft entering property that belongs to the plaintiff. Nuisance liability can be generated from activities occurring on property owned by the offending party or someone else that adversely affects the plaintiff. A nuisance can and does occur outside the plaintiff's "immediate reaches of the enveloping atmosphere." Thus, an aircraft operator may be liable for a private nuisance even though s/he did not enter into the airspace surrounding land owned or occupied by the offended party. *See* Integration of Drones into Domestic Airspace: Selected Legal Issues, Congressional Research Service, page 11.

Generally a private nuisance is defined as an invasion of private spaces that is "unreasonable under the circumstances." Actionable nuisance impacts in the context of manned aircraft are noise, dust and the fear of an aircraft crashing into one's home. In the context of drones, general annoyance and both real and perceived privacy intrusions will no doubt be added to the list of actionable nuisance impacts. A claim for a private nuisance can generally lie regardless of whether the offending use is lawful. *Cf Richards v. Washington Terminal Co*., 233 US 546, 553 (1914) ("We deem the true rule, under the 5th Amendment, as under state constitutions containing a similar prohibition, to be that while the legislature may legalize what otherwise would be a public nuisance, it may not confer immunity from action for a private nuisance of such a character as to amount in effect to a taking of private property for public use.")

Richards v. Washington Terminal Co., Id., distinguished for liability purposes those nuisance activities associated with a railroad that were location dependent and those that were not. Thus, the court explained that smoke and fumes emanated from a tunnel placed through mountain intervening between the train and its destination, did not expose the railroad to liability because the tunnel's location was necessary. "But the doctrine, being founded on necessity is limited accordingly" and so the adverse effects attending an elective location of the rail or facilities adjacent to private property railroad exposed the railroad to liability. We infer from *Richards* that there may be something akin to a "rule of necessity" defense argued to apply to drone flights. Consider *Jacobson v. Crown Zellerbach Corp*., *supra*, in which the Oregon Supreme Court determined no private nuisance claim could lie (and suggested in dicta no taking claim would lie either) where constant vibration from logging trucks on a county road were damaging a home and thus alleged to cause a private nuisance to homes very close to the road. The private nuisance claim was dismissed, because the log trucks were using the road in

[34] 273 Or 15, 539 P2d 641 (1975).

conformity with all applicable regulations. The *Jacobson* Court, 273 Or at 20, 559 P.2d at 644, explained:

> "In this case, the county chose to run the road past plaintiffs' house. If an adjacent landowner could sue any member of the traveling public who puts a burden upon his land by use of the highway in conformance with existing regulations, an intolerable burden would be placed upon public transportation, travel and commerce."

Finally, under *Richards*, we learn that it may be a defense to liability in any liability category, if the adverse impacts suffered by a property owner can be characterized as adjusting the benefits and burdens of economic life or are common to adverse impacts generally shared by the community at large. Thus, in *Richards* the Supreme Court observed:

> "Any diminution of the value of property not directly invaded nor peculiarly affected, but sharing in the common burden of incidental damages arising from the legalized nuisance, is held not to be a 'taking' within the constitutional provision. The immunity is limited to such damages as naturally and unavoidably result from the proper conduct of the road and *are shared generally by property owners whose lands lie within range of the inconveniences necessarily incident to proximity to a railroad.* It includes the noises and vibrations incident to the running of trains, the necessary emission of smoke and sparks from the locomotives, and similar annoyances inseparable from the normal and non-negligent operation of a railroad." (Emphasis supplied.)

On the other hand, notwithstanding federal sovereignty and the right of free transit in the federal navigable airspace, case law has developed to establish that those whose land is beneath or near flight paths who are adversely affected by aircraft flights, have property rights that are constitutionally protected[35] and personal rights that are protected by tort law.[36] Thus, with drone related nuisance claims, there will be a "sweet spot" that is likely to be fact driven. The more we all agree that the conduct of the drone operator is unacceptable, the more likely it is to be actionable in nuisance.

Here, it is important to note that some lower federal courts, in search of a black letter rule, have placed a figurative fence on liability at the 500 foot AGL mark in what the Federal Circuit dismissed as having been done in "more or less * * * mechanical fashion."[37] This practical rule reflects shared values of a people accustomed to and who are enthusiastic users of aircraft who do not, and cannot if they want to protect that use, agree that flights at 500 ft. can be characterized as a nuisance.

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[35] *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).

[36] *Greater Westchester Homeowners Assn. v. City of Los Angeles*, 26 Cal.3d 86 (1979).

[37] *Argent v. United States*, 124 F.3d 1277, 1281 (Fed. Cir. 1997) *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).

Fourth Amendment search and seizure cases further inform where flights in navigable airspace might lead the operator to nuisance liability. In *Florida v. Riley*, 488 US 445, 451-52 (1989), in a 5-4 decision, the majority of the United States Supreme Court decided that a police officer's observation from a helicopter at 400 feet that marijuana plants were being grown in a private backyard greenhouse where the greenhouse was fully fenced but not fully enclosed at its roof, was not unreasonable. Important, to this paper, the Court warned that: "We would have a different case if flying at [400 feet] had been contrary to law or regulation." *Florida v. Riley*, 488 US 445, 452 (1989). The court's analysis is instructive:

> "Any member of the public could legally have been flying over Riley's property in a helicopter at the altitude of 400 feet and could have observed Riley's greenhouse. The police officer did no more. This is not to say that an inspection of the curtilage of a house from an aircraft will always pass muster under the Fourth Amendment simply because the plane is within the navigable airspace specified by law. But it is of obvious importance that the helicopter in this case was *not* violating the law, and there is nothing in the record or *before us to suggest that helicopters flying at 400 feet are sufficiently rare in this country to lend substance to respondent's claim that he reasonably anticipated that his greenhouse would not be subject to observation from that altitude.* Neither is there any intimation here that the helicopter *interfered with respondent's normal use of the greenhouse or of other parts of the curtilage*. As far as this record reveals, no intimate details connected with the use of the home or curtilage were observed, *and there was no undue noise, and no wind, dust, or threat of injury*." (Emphasis supplied.)

These statements are tempered by Justice O'Connor's swing concurrence opinion that cast her with the 5-4 majority:

> "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."

Privacy

Federal Constitutional Law

The Unites States Constitution has no express "right of privacy". However, the United States Supreme Court has, in several cases, inferred a right of privacy from various constitutional provisions. The Court admitted privacy was an inferred right in *Roe v. Wade*, 410 U.S. 113 (1973), explaining in the justification for its decision: "This right of privacy, whether it be founded in the Fourteenth Amendment's concept of personal liberty and restrictions upon state action, as we feel it is, or, as the District Court determined, in the Ninth Amendment's reservation of rights to the people, is broad enough to encompass a woman's decision whether or not to terminate her pregnancy * * *." In *Griswold v. Connecticut*, 381 U.S. 479 (1965), the majority opinion for the Court found a right of privacy that justified striking down a state law prohibiting giving contraception advice to married couples, in "penumbras" emanating from express protections in the Bill of Rights. Whatever its source, it is well established that the federal constitution offers a "right of privacy" to citizens, although its scope and subjects is not

yet fleshed out. In determining what federal "rights of privacy" protect private persons from private intrusions by drone operators, there are no specific "right of privacy" cases to draw from beyond general pronouncements along the lines above. There are, however, a line of informative cases that deal with an individual's constitutional expectations of privacy in "constitutionally protected spaces,"[38] in federal Fourth Amendment (search and seizure) jurisprudence.

The United States Constitution Fourth Amendment search and seizure cases are helpful reference points for understanding federally protected rights of privacy in the age of drones, as well as the limits on warrantless governmental intrusions into "constitutionally protected spaces" using drones. This is because a key part of the two part inquiry into whether a particular warrantless search is an unlawful search under the Fourth Amendment, asks: (1) "has the individual manifested *a subjective expectation of privacy* in the object of the challenged search," and (2) "is society will to recognize that expectation as reasonable"? (Emphasis supplied.) *California v. Ciraolo,* 476 U.S. 207, 211 (1986), *citing Katz v. United State*s, 389 U.S. 347 (1967). Under the Fourth Amendment, a subjective expectation of privacy is not enough to make particular invasive conduct unlawful; rather society must also regard a subjective expectation of privacy as "reasonable."

In *Ciraolo*, police had a tip that the defendant was growing marijuana in his back yard. The back yard operation could not be seen from the ground, as it was shielded from street view by two layers of fences, a six foot outer layer and a ten foot inner layer. There could be no question that the owner had a subjective expectation of privacy from ground level for what the Court called "his unlawful agricultural pursuits." There was also no question that the activity was taking place in the "curtilage" of the dwelling, which area receives heightened protection from intrusion. But the police observation of the growing operation occurred from a small aircraft that flew over defendant's home at 1000 ft. AG or higher, in the navigable airspace, and took photos with "a standard 35mm camera." Thus, while the United States Supreme Court acknowledged that the back yard operation was within the home's "curtilage", the court explained that it was not reasonable for the defendant to believe that his yard was secure from observations by the naked eye from the air. The Court explained that either a passing aircraft (even if not specifically looking at defendant's property) 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" (the navigable airspace is a "public space") does not violate the Fourth Amendment, even if those observations invade the curtilage. Important to the outcome in *Ciraolo,* is that no technological enhancements were used to view the curtilage.

Further, areas outside of the home and its curtilage (even if part of the home ownership area) may be considered "open fields" to which society has decided there is no reasonable expectation of privacy. Thus, there is something called the "open fields" exception to the Fourth Amendment's privacy protections that can apply on particular facts. Accordingly, in *Hester v. United States*, 265 U.S. 57 (1924), a federal revenue officer's observation during prohibition of the defendant handing a bottle of liquor to another person, was not an unreasonable and, thus, unlawful search under the Fourth Amendment. This principle was later limited slightly in *Oliver v. United States*, 466 U.S. 170, 178 (1983), which decided that a police trespass onto private land

[38] *Katz v. United States,* 389 U.S. 347 (1967) (public phone booth is a "constitutionally protected area.")

did not violate the Fourth Amendment because "an individual may not reasonably expect privacy out of doors in fields, except in the area immediately surrounding the home."

In 2013, in *Florida v. Jardines* the Supreme Court decided that a drug sniffing dog brought onto the front porch of a home (clearly an area "immediately surrounding" the home) and allowed by his handlers to sniff at will until he indicated the presence of illegal drugs, was an unreasonable thus unlawful intrusion into private, constitutionally home spaces. The *Jardines* majority opinion was not decided on the privacy prong of the Fourth Amendment analysis. Rather, the decision rested on the straightforward grounds that a highly trained dog was brought to the front porch of a home to ascertain what was going on inside the dwelling. The government argued there was nothing unusual about using trained dogs and that dogs had been used for centuries to detect activity and objects. However, the majority of the Court was not persuaded and reinforced that when government physically intrudes into the curtilage of a home "to explore details of the home * * * the antiquity of the tools that they bring along is irrelevant." Justice Kagan, in her concurring opinion (joined by Justice Ginsburg and Sotomayor), would have also found the police conduct an unlawful search under the privacy prong of the Fourth Amendment analysis:

> "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."

Justice Kagan went on to explain:

> "As this Court discussed earlier this Term, drug-detection dogs are highly trained tools of law enforcement, geared to respond in distinctive ways to specific scents so as to convey clear and reliable information to their human partners. *See Florida v. Harris*, 568 U.S. _, 133 S.Ct. 1050, 1053-1054, 1056-1057, L.Ed.2d (2013). They are to the poodle down the street as high-powered binoculars are to a piece of plain glass. Like the binoculars, a drug-detection dog is a specialized device for discovering objects not in plain view (or plain smell). And as in the hypothetical above, that device was aimed here at a home — the most private and inviolate (or so we expect) of all the places and things the Fourth Amendment protects. Was this activity a trespass? Yes, as the Court holds today. Was it also an invasion of privacy? Yes, that as well."

She explained that using technological enhancements to gain information about what is going on inside a home is as a matter of a "'firm' and 'bright' line" presumptively unlawful under *Kyllo v. United States*[39]. *United States v. Kyllo* is a 5-4 Supreme Court case involving

[39] 533 U.S. 27 (2001).

police thermal imaging, to detect what is going on inside a dwelling, 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 to be an unlawful search and seizure.

The four dissenting *Kyllo* 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 (thermal imaging) "not in general public use" in the context of obtaining information about the going on in a "private home, where privacy expectations are most heightened" is "presumptively unreasonable" without a warrant.

Thus, from these precedents, we infer as we consider drones and privacy, that there is a protected right of privacy that distills to three key elements:

1. A person's home and its curtilage are a "constitutionally protected area" and as such receive the greatest protection from intrusions.

a. If a "telephone lineman" could see the activity from a phone pole on which he is working there is probably no reasonable expectation of privacy.

b. Bringing an enhancement – whether a drone or dog -- to the home or its curtilage to view activities or objects that people would expect to be private, is likely invade a person's privacy. However, if this intrusion does not occur from law enforcement activity subject to the Fourth Amendment, then the teeth to such right of privacy is if there is a state constitutional or statutory law that protects against such intrusive conduct.

2. Intrusions into a person's home and curtilage using technological enhancements not in general public use (thermal imaging for sure but no doubt someone will argue drones themselves fall into this category), are presumptively unreasonable.[40]

3. Intrusions that collect data or images from places that are not one's home may nevertheless be an invasion of the right of privacy in "constitutionally protected spaces" if, we as a society, reasonably believe the activity in that space, to be private. As we learned from *Katz*, a public phone booth is a constitutionally protected space.

The importance of the "constitutionally protected area" – whether it be one's dwelling, its curtilage, a phone booth or other private space – cannot be underestimated. Society – and thus judges – have established limits on what activity can reasonably be expected to be private. Accordingly, in *Dow Chemical v. United States,*[41] the Supreme Court decided that technological perception enhancements from the air were not an unlawful search and seizure of an *industrial complex*. In *Dow*, the court explained that "for purposes of aerial surveillance, the open areas of an industrial complex are more comparable to an 'open field' in which an individual may not legitimately demand privacy. *Oliver v. United States,* 466 U.S. 170, 104 S.Ct. 1735, 80 L.Ed.2d

[40] This would apply to low flying drones, as well as satellites and Google Earth passenger vehicles that take more than "street view" photographs.
[41] 476 U.S. 227 (1986)

214 [1984]." *See also Donovan v. Dewey*, 452 U. S. 594, 452 U. S. 598-599 (1981), (quoted in *Dow* explaining: "government has 'greater latitude to conduct warrantless inspections of commercial property' because 'the expectation of privacy that the owner of commercial property enjoys in such property differs significantly from the sanctity accorded an individual's home.'")

However, the Court in Dow Chemical made some observations that are worth considering in the context of drone and other technological advanced means of gathering personal data and images:

> "Hence, there is no prohibition of photographs taken by a casual passenger on an airliner, or those taken by a company producing maps for its mapmaking purposes." *Id.* 476 U.S. at 232.
>
> And
>
> "[T]he photographs here are not so revealing of intimate details as to raise constitutional concerns. Although they undoubtedly give EPA more detailed information than naked-eye views, they remain limited to an outline of the facility's buildings and equipment. *The mere fact that human vision is enhanced somewhat, at least to the degree here, does not give rise to constitutional problems*." (Emphasis supplied.) *Id.* 476 U.S. 238-239.

<u>Federal Agency Privacy Expectations Presidential "Memorandum for Heads of Executive Departments and Agencies" Regarding "Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems."</u>

On February 15, 2015, President Obama issued his Memorandum for Heads of Executive Departments and Agencies" Regarding "Promoting Economic Competitiveness While Safeguarding Privacy, Civil Rights, and Civil Liberties in Domestic Use of Unmanned Aircraft Systems."

This policy establishes significant guard rails on how federal agencies use drones and collect data on individuals. It states:

> "The Federal Government currently operates UAS in the United States for several purposes, including to manage Federal lands, monitor wildfires, conduct scientific research, monitor our borders, support law enforcement, and effectively train our military. As with information collected by the Federal Government using any technology, where UAS is the platform for collection, information must be collected, used, retained, and disseminated consistent with the Constitution, Federal law, and other applicable regulations and policies. Agencies must, for example, comply with the Privacy Act of 1974 (5 U.S.C. 552a) (the 'Privacy Act'), which, among other things, restricts the collection and dissemination of individuals' information that is maintained in systems of records, including

personally identifiable information (PII), and permits individuals to seek access to and amendment of records."

The policy requires federal agencies to update their policies and procedures to ensure that "privacy, civil rights, and civil liberties are protected" in all federal UAS operations.

It requires all federal agency policies and procedures to include the following requirements:

> "(i) Collection and Use. Agencies shall only collect information using UAS, or use UAS-collected information, to the extent that such collection or use is consistent with and relevant to an authorized purpose.
> (ii) Retention. Information collected using UAS that may contain PII shall not be retained for more than 180 days unless retention of the information is determined to be necessary to an authorized mission of the retaining agency, is maintained in a system of records covered by the Privacy Act, or is required to be retained for a longer period by any other applicable law or regulation.
> (iii) Dissemination. UAS-collected information that is not maintained in a system of records covered by the Privacy Act shall not be disseminated outside of the agency unless dissemination is required by law, or fulfills an authorized purpose and complies with agency requirements.

Finally, the policy includes provisions prohibiting discriminatory conduct, requiring accountability and transparency.

State Constitutional Law/State Statutes

A federal constitutional right of privacy exists. But that federal right of privacy inferred from our constitution means little to stop or punish intrusions visited on individuals by private operators. The right must be enforced to be meaningful, but there is no federal legislation that protects against such private intrusions by private operators. This is where state or local laws come in.

Many states do have specific constitutional or statutory protections creating enforceable state rights of privacy. The Constitutions of Alaska, Arizona, California, Florida, Hawaii, Illinois, Louisiana, Montana, South Carolina and Washington all have explicit provisions recognizing a right to privacy. In 2014, while not an express "right to privacy", the State of Missouri amended its constitution to specifically protect private "electronic communications and data" and specified that any warrant to "access electronic data or communication" be on probable cause.[42] Many states also have adopted legislation that prohibit voyeurism, or data or image collection of persons without their consent and some statutes are specific to drones.[43] These

[42] http://www.sos.mo.gov/elections/2014ballot/SJR27.pdf
[43] For a list of drone specific laws in the 50 states that is current as of July 15, 2015, see the list maintained by the National Conference of State Legislatures at: http://www.ncsl.org/research/transportation/current-unmanned-aircraft-state-law-landscape.aspx

should be reviewed however with an eye toward understanding that data collected by drone as with any aircraft, is collected from "public highways". Remember, FAA designates navigable airspace, which in turn becomes a public highway for aircraft, and that navigable airspace may be within private property. Many state privacy laws contain exceptions for privacy intrusions that occur from public highways or similar limits.

State and local governments can protect either the federal right of privacy or state law rights to privacy, by adopting or beefing up legislation directed at prohibited invasive conduct. Personal data or image collection taken while a person in at their home would seem a ripe subject for protection. Such state or local legislation is most likely to avoid preemption trouble if directed at improper conduct occurring in spaces we can all agree are reasonably expected to be free from such intrusions, rather than at drones themselves. So long as state or local legislation does not have the effect of adversely affecting FAA's primacy in designating flight routes, circumstances of flight, uniformity of flight or the qualification of operators, it is difficult to see that there would be meritorious preemption claims against state law privacy protections.

One reason is that the FAA has made clear it does not intend to regulate privacy and leaves that to other authorities. Accordingly, in FAA's Roadmap and Comprehensive Plan, FAA explained that it would not promulgate specific privacy rules, but rather would leave privacy to others.[44] On the same date it issued the Roadmap and Comprehensive plan, FAA issued its privacy policy for drone operations at the federally designated test sites, a policy reflecting FAA's hands off approach to privacy.[45] Essentially, the FAA "privacy policy" applies only to federally designated test sites and says that the test sites must adopt specific privacy procedures and rules, allow public comment and annual review of those privacy rules, as well require all operators as 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.

FAA's hands off position on privacy is probably smart. FAA's effort to impose UAS restrictions to protect privacy would itself no doubt face challenge. It is axiomatic that agencies have no inherent authority, but rather only the authority that is delegated to them. *See Louisiana Pub. Serv. Comm'n v. FCC*, 476 U.S. 355, 374 (1986). In what seems to be a stunning oversight, Congress did not expressly provide FAA authority to regulate privacy. Congress did, however, direct FAA to "define the acceptable standards for operation and certification of civil unmanned aircraft systems".[46] It is certainly possible that this language may have created sufficient ambiguity that FAA can interpret its own jurisdiction to decide it has the authority to regulate UAS for privacy considerations and gain deference regarding its interpretation. *See City of Arlington v. FCC*, 133 S.Ct. 1863 (2013). However, it is equally, and perhaps more, reasonable

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[44] http://www.faa.gov/about/office_org/headquarters_offices/agi/reports/media/UAS_Comprehensive_Plan.pdf

[45] 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

[46] FMRA Section 332.

to say that there is no ambiguity and hence no need for interpretation, but rather FAA has no authority to impose privacy rules on drones.

The First Amendment and related state constitutional rights to collect news, impose limits on how far state or local privacy laws may go. These limits are wholly separate from preemption claims. Voyeuristic data or image collection of a person in their home or the home's curtilage is reasonably likely to avoid First Amendment and related types of liability. On the other hand, if a news chopper can hover to collect news occurring at a home or its curtilage, then equivalent drone conduct cannot likely be prohibited consistently with the First Amendment and related authorities. What is and is not news and who is and is not newsworthy has been and will continue to be litigated. The intersection of the First Amendment and privacy has long been and continues to be a foggy one.

In any case, it is reasonably clear that state and local governments are free to protect the privacy of individuals from unreasonably invasive conduct, but that they should do so in a manner that considers the principles outlined in this paper. If a state and local government privacy law is so strict that some flight routes became unavailable or are severely limited, or that the rules of flight uniformity from state to state are impaired, then a court is likely to find such laws to be preempted. Moreover, if all news collection by drone is foreclosed, then such prohibition is likely to collide with the First Amendment and related authorities. To predict the legal envelope that informs how we protect privacy, the best path forward thinks deeply about the inevitability of technological advancement, our expectations from that advancement, the legal precedents that have dealt with the technological advancements that came before and the reasonable limits of our shared expectations to be left alone.

Distilling these Principles – a Way Forward with Legally Inferred "Best Practices"

FAA has the authority to designate and regulate navigable airspace.

No person may lawfully shoot down a drone in navigable airspace. State and local government may not authorizing people to shoot drones in navigable airspace.

State and local governments do not have the authority to regulate where, how high or the mechanical circumstances for drone flight or for any other aircraft.

Private property can exist in navigable airspace. The scope of private real property into airspace is loosely defined as the "immediate reaches of the enveloping atmosphere". This is likely to be at least where buildings are or may be erected and that airspace which is controlled by the occupants in the "curtilage" to avoid being, objectively measured, driven crazy. If applicable zoning rules authorize homes or 30 foot structures, the airspace from the surface to 30 feet is likely privately owned. The right to exclude others has long been a part of the bundle of sticks of property ownership. There is no reason to think that the exclusion stick in the bundle does not apply to privately owned airspace.

Accordingly, for commercial drone commerce to have the best chance of success, high traffic routes needed in low altitude (likely) privately owned airspace, should be acquired via

avigation easement. To fail to acquire avigation easements in such areas is a formula for litigation and to significantly impair public acceptance of the technology.

Low altitude navigable airspace routes for drones should come with enforceable rules about data collection on nonconsenting privately owned property.

State and local governments have authority to adopt privacy laws so long as they do not undermine or impair the efficacy of FAA's rules.

Hovering a drone at low altitude over a home or its curtilage in a manner annoying to the occupants is likely a nuisance and trespass in almost every state.

Hovering a private drone at low altitude *next door* to capture images or data of neighbors in "constitutionally protected areas" like dwellings and their curtilage is probably not a per se nuisance or trespass since this conduct can happen with or without a drone. However, state or local governments can limit or prohibit the data collected in such circumstances to protect individual privacy. Such local laws would be limited only by First Amendment and related state constitutional protections.

State and local governments retain authority to define nuisance and trespass and to criminalize invasive conduct, and FAA's authority only preempts these state or local laws where they interfere with federal uniformity regarding the rules of flight and the safety of the NAS.

Liability is greatest with low altitude flights over residential real estate. Flights over industrial or commercial complexes are less likely to expose an operator or governmental permitting agency, to liability of any kind.

Directing drone flights to public areas, including public rights of way, will further diminish airspace related liability.

Governmental actors that run airports from which drone flights take off and land, that franchise recharge stations or that operate drones, must consider unconstitutional taking liability for drone flights under the following circumstances: 1) the flight they have authorized or flown intrudes into the "immediate reaches of the enveloping atmosphere" of private property; 2) the flight substantially interferes; with 3) the use and enjoyment of privately owned property. It is likely a defense that governmental sponsored or permitted adverse impacts are generalized and simply an adjustment of benefits and burdens of daily life.

State and local governments retain their police power to zone property for airports, including drone airports and for drone battery recharge stations.[47]

Government land use authorities should be careful to ensure that drone commerce "airport" areas, including areas for testing unmanned aircraft, are an allowed land use.

[47] There is no reason to think that state and local government will overlook the potential cash cow of leasing public property (lamp posts or other) for drone battery recharging.

Designation of navigable airspace does not necessarily immunize operators from liability or make information gained from navigable airspace immune from the Fourth Amendment search and seizure clause. On the other hand, drone operators who fly in FAA designated navigable airspace consistent with all FAA rules, diminish the potential for liability to private property owners for nuisance or trespass. Same for governmental actors whose purposes for using drones (or any aircraft) are subject to the reach of the Fourth Amendment.

Federal, state, local and private liability will depend on, and fluctuate with, the cultural acceptance of drones. However, careful governmental regulators and operators can avoid liability and improve the public's acceptance of the technology by employing best practices.