



POINT

Clearing the Air: ULC Rightfully Rejects Property Rights Advocates' Line in the Sky

By Joshua S. Turner & Sara M. Baxenberg



The proliferation of small unmanned aircraft systems (UAS, or “drones” in the vernacular) in recent years and the extent to which UAS technology stands poised to transform numerous industries may appear to raise novel legal issues for those who are concerned about these aircraft flying overhead and becoming

part of daily life. Indeed, as companies continue to innovate, developing UAS applications for package delivery, infrastructure inspection, search and rescue missions, and all manner of groundbreaking

operations, the presence of this technology has sparked debates on issues including the boundaries of private property; the role of federal, state, and local governments; and the rights of property owners.

None of these debates, however, is fundamentally new—they emerged and were deliberated and settled more than 50 years ago as “traditional” manned aviation evolved from a revolutionary to a routine way to transport people and property. Although drone operations present new fact patterns, the experience of manned aviation provides a clear route to resolution: a legal paradigm in which property owners’ *use of their*

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COUNTERPOINT

The Rise of Drones and the Erosion of Privacy and Trespass Laws

By Ronnie R. Gipson Jr.

As a law professor, one of the pleasures of my profession is teaching tort law to first-year law students. When we start on the law of trespass, I begin by describing the situation of kids cutting across an elderly man’s yard on the way home from school. I start simple, then add variables to the description as we talk through the hypothetical circumstances. In this way, I am able to illustrate nuances to the

students to introduce several legal doctrines, such as the landowner/occupier trichotomy, the attractive nuisance doctrine, privacy, and trespass.

Technological advancements are giving new life to this tried-and-true learning methodology. In particular, the development and growth of unmanned aerial systems/vehicles (UAS/UAV) technology, commonly

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EDITOR-IN-CHIEF

David A. Berg
airberg600@gmail.com

MANAGING EDITOR

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kathy.yodice@yodice.com

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FORUM MANAGER—Dawn R. Holiday
dawn.holiday@americanbar.org
312/988-5660

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Chair's Message

When we published the previous issue of *The Air & Space Lawyer*, we were only a few months into the COVID-19 crisis. We have all experienced quite challenging months not only as we cope and adapt to the changes brought about by the novel coronavirus but also as we reflect on recent events and seek out ways we can combat racism. It is time for us to double down on the Forum's long-standing commitment to supporting the aviation sector through difficult times and to creating a more diverse, inclusive, equitable, and just environment for our members, for the Forum, and for all.

The Forum has always been an organization that has strived for equality, diversity, and inclusion—in every sense of those words. Like Forum chairs before me and with the support of our Diversity Liaison, Abby Bried, and our ABA Forum Manager, Dawn Holiday, the Forum strives to provide opportunities for all voices to be heard. To succeed in this, we must be intentional and proactive about providing opportunities to our lawyers of color, LGBTQ+ lawyers, lawyers with disabilities, women lawyers, and other lawyers often discriminated against due to religion and socioeconomics.

We can and should do better. The Forum always ensures that we meet the ABA's diversity guidelines, and I challenge us as an organization to do more. Let us together look for ways to mentor, develop, and use our privilege to provide opportunities that foster equality, diversity, and inclusion within the Forum and beyond. I challenge Forum members to seek out ways to partner with each other across our organizations to work together to combat racism and promote diversity and inclusion in the aviation sector.

As many of you are aware, the Forum works closely with the ABA's Diversity & Inclusion Advisory Council. I echo the Council's reminder to each of us that shifts in our work dynamics as a result of the pressures of the COVID-19 crisis will negatively impact minorities and that pipeline-building and mentorship programs often backslide. Each of us has the power to foster specific strategies that help underrepresented people during times of uncertainty. I challenge each of you within your own work teams to help ensure that work and profile-raising opportunities are being allocated equitably across backgrounds; make sure that capacity or workforce shift conversations do not have a disproportionate impact on underrepresented people; and have bias interrupters/advocates/D&I leaders at the table keep diversity top of mind and stand in the gap for those who are underrepresented.

We are excited for the Forum's upcoming Annual Conference and Meeting to be held September 9–11, 2020. The agenda is packed with the aviation thought leaders and will focus on the impacts of the pandemic on the industry, as well as provide critical insights into the recovery and renewal of the industry in the months and years ahead. As we announced in February and for the first time, our Annual Conference will feature a session focusing on equality, inclusion, and diversity within the aviation sector. The session also

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Jennifer Trock (jennifer.trock@bakermckenzie.com) chairs Baker McKenzie's North America International Commercial Practice Group, is a member of its Global Aviation Group in Washington, D.C., and leads the firm's unmanned aircraft systems (UAS) focus team.



Editor's Column

As the U.S. airline industry continues to struggle against the impact of the coronavirus and COVID-19 (see below), industry lawyers are playing an important advisory role for their clients, navigating a host of legal, regulatory, and financial challenges no one saw coming at the start of this year. In this issue, United Airlines' Bob Rivkin, senior vice president and general counsel, provides his unique insights into helping his company execute on its evolving efforts to survive the longest-lasting exogenous shock the industry has experienced in modern times—if not its entire history. Our interview with Rivkin follows on last issue's interview with Southwest Airlines' Mark Shaw.

This A&SL issue focuses on developing technologies and associated legal and policy issues. First up, a pair of point-counterpoint articles debate whether the Tort Law Relating to Drones Act being developed by the Uniform Laws Commission should define the tort of trespass by following the aerial trespass doctrine, which requires substantial interference with the use and enjoyment of property to establish the tort when a drone overflies another's property, or by following the historical, strict-liability common law doctrine, which merely requires a showing of unauthorized entry onto (in this case, over) another's property. Josh Turner and Sara Baxenberg, and Professor Ronnie Gipson Jr. illuminate the background and underlying legal principles fueling this debate.

What does the future hold for personal modes of air transport, and does the current regulatory structure allow urban air mobility concepts to develop and come to market? Jeff Immel and Alex Langlins look at some of the challenges facing innovation and commercialization of this futuristic concept for passenger and cargo air

transport. Rounding out this issue's substantive articles is a fascinating review by Chris Johnson of the legal and regulatory sources supporting the United States' reinvigorated interest in space exploration and the use of space resources. This is an excellent piece for those of us not involved in space law on a daily basis. In addition to the substantive articles, Dean Griffith and Kelli Hooke highlight recent activities of the Forum's Drone Law Committee. If you are interested in drone law, contact Dean or Kelli to get involved in the Committee.

In these extraordinary times, it is important to recognize the industry context in which we operate as lawyers. While there has been some improvement since the spring, true recovery for U.S. airlines remains distant. According to Airlines for America, as of July 27, 2020, 17 airlines worldwide have been forced to restructure or cease operations, including four U.S. airlines. For the week ending July 19, U.S. airline domestic passenger volumes remained down 75 percent over the prior year, averaging just 54 passengers per flight on drastically reduced schedules. Net booked revenue was down 91 percent year-over-year, and approximately 1,900 aircraft—31 percent of the domestic fleet—were idled. The knock-on effects for airports, manufacturers, maintenance, and service providers have been equally devastating. For individual companies to survive, Forum members, both outside counsel and in-house, must provide informed advice tailored to their clients' needs while understanding the broader legal and policy implications of the current and future state of the industry. These are challenging times for all, and *The Air & Space Lawyer*, together with the Forum, is here to support its members as much as possible.

David Berg (airberg600@gmail.com) was general counsel of Airlines for America for 15 years before retiring in 2018. He was Chair of the Forum on Air and Space Law from 2003 to 2005. He resides in Las Vegas, Nevada.

Interested in writing an article for *The Air & Space Lawyer*?
Contact **Kathy Yodice** (kathy.yodice@yodice.com) or
David Berg (airberg600@gmail.com).



An Interview with Robert S. Rivkin, Senior Vice President and General Counsel, United Airlines

Robert S. Rivkin has been the senior vice president and general counsel of United Airlines since March 2019. Before joining United, he held a number of high-profile positions, including many in the transportation industry: senior vice president and deputy general counsel of Delta Air Lines, general counsel of the U.S. Department of Transportation, and general counsel for the Chicago Transit Authority. He has also served as Deputy Mayor of the City of Chicago.

A&SL: Tell us a little about your background.

RR: I attended Harvard College and Stanford Law School. After clerking for a federal judge, I spent five years as an assistant U.S. attorney in Chicago prosecuting a broad range of criminal cases and arguing appeals. I then worked on policy and special projects for Chicago's corporation counsel before joining a Chicago law firm as a litigation partner. After a few years, I accepted an unexpected offer to become general counsel of the Chicago Transit Authority, which was my first job in the transportation sector. I decided I enjoyed in-house practice, so after a few years I joined Aon Corporation as deputy general counsel. In 2009, after co-leading the Obama campaign's transportation policy group, I joined the U.S. Department of Transportation (DOT) as general counsel. After four years there, I joined Delta Air Lines as deputy general counsel. I returned to Chicago in 2016 and served as deputy mayor until United brought me on as general counsel in March 2019.

A&SL: What drove your interest in transportation and, more specifically, aviation? Were you always interested in aviation?

RR: Probably like most of us, as a kid I was an enthusiast for planes, trains, and automobiles (and trucks, buses, and boats)! I had traveled around the world from my earliest years, living in Europe and Africa, but I first became interested in transportation issues as part of my engagement in civic and political matters as a young lawyer, and I worked on some aviation issues for the City of Chicago. But it wasn't until I arrived at DOT that I became heavily involved in aviation.

A&SL: You've been both a government lawyer/regulator and in-house counsel/advocate. What are the keys to success for these roles, and are there critical differences?

RR: In my experience, large organizations, whether private sector or governmental, share certain key dynamics. The decision-making processes can be cumbersome, and the interplay between HQ and field functions and executives is similar. In any large organization, a new general counsel has to get to know the operational executives and ascend the learning curve as quickly as possible to understand the scope and strategy of the different business and operational units, whether they be FAA/FWHA/NHTSA/FTA/etc. or Flight Ops/Tech Ops/Network/Finance/etc. Legal departments also have to try to organize themselves to serve a matrix of business units, geographies, and subject matter challenges. I'm not sure there's one structure that is optimized to handle that. The most important key to success is hiring and developing the best people.

A&SL: For young lawyers interested in aviation or another transportation sector, what are your thoughts on obtaining federal agency experience before moving into the private sector?

RR: Serving in government as a young lawyer is a great way to quickly gain responsibility and experience in a chosen field. You can gain credibility as an expert before you embark on a private-sector career.

A&SL: What functions are in the United legal department, and what additional functions report to you as general counsel?

RR: The United legal department includes the corporate, securities, finance, commercial, litigation, government contracts, intellectual property, antitrust, environmental, regulatory, labor and employment, employee benefits, legal operations, and international groups. I am also responsible for security, facilitation, compliance, ethics, and investigations.

A&SL: What do you and your team do to be part of business decisions at United? How do you integrate into the larger business team?

RR: This is one of the biggest and most persistent challenges for in-house counsel. My philosophy is that lawyers need to get out of their offices, learn the business, focus on being business partners who bring solutions and not just identify problems, and in that way earn trust so that a business leader is inclined to include us in her core team processes and decisions. That is much easier said than done. But if lawyers are called upon only to document an already negotiated deal or to handle a dispute once litigation is filed, we are much less effective in helping the company achieve its goals.

A&SL: Going forward, what are your top priorities as general counsel, and what are the legal and/or regulatory challenges that concern you the most?

RR: In the wake of the economic impact of the pandemic, we have to figure out how to do our jobs more efficiently with fewer lawyers. That also means we have to use outside counsel more efficiently. We will be dealing with the effects of the pandemic on our personnel, union relations, and liabilities for quite some time. And we will be evaluating our diversity, equity, and inclusion policies, as a company and as a department, to see where we can do better and take appropriate action.

A&SL: How has the United legal team assisted in contributing to United's response to the coronavirus pandemic?

RR: We have been working at the core of the executive team, helping to raise liquidity and figure out how we transition into being a smaller and more flexible

airline ready to snap back as soon as travel demand returns. For example, we've been working with our finance colleagues to negotiate complex financing deals with the private market and with the Treasury Department under the CARES Act, advising on CARES Act compliance, defending against putative class actions stemming from United's response to the crisis, working with DOT and DHS regulatory agencies regarding new requirements imposed under the pandemic, and negotiating changes to contracts of all sorts.

A&SL: How have you utilized outside counsel during this period, and what are your expectations going forward?

RR: We have relied heavily on outside counsel for difficult and innovative financing deals and labor issues. We will continue to spend more on outside counsel than we do employing in-house counsel, but our budgets will be smaller until the airline is once again operating at full throttle.

A&SL: What are the top two or three pieces of advice you would pass on to young lawyers interested in an aviation legal career?

RR: Wait until the pandemic is over! All kidding aside, there are not many aviation practices in the country, and very few outside of Washington. I would tell young lawyers without enough experience to get a job at an airline to pursue a position with the FAA, the DOT Office of General Counsel, NTSB, TSA, or an airport authority.

A&SL: What are you looking forward to doing when things get back to, or approximate, normal?

RR: Traveling the world once again (on United, of course)! I've got cabin fever.

land is protected from undue interference, but property owners cannot claim a per se right of exclusion in the airspace *above* their land.

The Aerial Trespass Doctrine Balances Competing Interests and Ensures Airspace Safety

This resolution arises out of the well-established doctrine of “aerial trespass,” a hybrid approach that incorporates elements of both nuisance and property law to balance the rights of property owners with the need to safeguard the national common interest

in safe and efficient air navigation. The aerial trespass doctrine recognizes that to serve the latter interest, aviators must be able to overfly private property without first needing to negotiate easements or seek individual permissions. Similarly, in granting broad regulatory authority to the Federal Aviation Administration (FAA) in the areas of air navigation and aviation safety, Congress has recognized that to ensure the safety of the national airspace, a sole regulator—rather than 40,000 municipal governments or millions of individual property owners—is essential.

But with the emergence of drones, some advocates are looking to reopen these settled

debates and expand the rights of property owners. In the guise of protecting “traditional” property rights, they urge something far more radical—a rejection of decades of precedent and a revival of elements of the defunct *ad coelum* doctrine, which would give property owners an absolute right to exclude from the airspace itself, i.e., it would equate overflight with the historical, land-based tort of trespass. If successful, this wholesale rewrite of aerial trespass law would both threaten the safety of the national airspace system and potentially kill a nascent technology before it can even get off the ground.

Property rights can change as technology and the public interest in using that technology evolve.

This revisionary effort ignores the underlying questions that animate these debates: what does it mean for small, unmanned aircraft to substantially interfere with the use of property on the ground, and is that interference different in kind from the types of interference that have to date been caused by more traditional aircraft? Thoughtful deliberation of these questions will allow aviation, tort, and property law to move forward in a way that coheres with existing law and respects the interests of all stakeholders—property owners, the aviation industry, and regulators alike.

The origins of the aerial trespass doctrine date back to 1946, when the Supreme Court held in *United States v. Causby* that persistent, low-level overflights by U.S. military aircraft using a neighboring airfield constituted a taking of a chicken farmer’s property because of the disturbance the flights caused to the farmer’s chickens.¹ The *sine qua non* of the Court’s ruling was that the flights were “so low and so frequent as to be a direct and immediate interference with the enjoyment and use of the land.”² The doctrine of aerial trespass developed directly from this precedent, incorporating both the concept of low overflights and their impact on enjoyment and use of land. As set forth in the *Restatement (Second) of Torts*, “[f]light 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.”³ In the decades that followed, courts applied this standard in evaluating trespass claims against aircraft overflights.⁴

Although the *Causby* Court found that a taking had occurred—and thus identified a *limit* on the ability of government aircraft to transit the airspace—it is critical to understand how the decision also significantly limited property rights. Specifically, the Court considered the “ancient” *ad coelum* doctrine—under which “ownership of the land extended to the periphery of the universe”—and found that “that doctrine has no place in the modern world.”⁵ As a result, while the high volume of low-flying military aircraft at issue and the direct adverse effect they had on the farm’s operation resulted in a taking, the Court observed that, as a general matter, “[t]he airplane is part of the modern environment of life, and the inconveniences which it causes are normally not compensable under the Fifth Amendment.”⁶

Underlying the Court’s express rejection of the *ad coelum* doctrine was the important recognition that property rights can change as technology and the public interest in using that technology evolve. Indeed, by the time the *Causby* Court was writing, the aviation industry and the obvious public benefit of aircraft had developed such that, in the Court’s view, “common sense revolts at the idea” that if *ad*

Joshua S. Turner (jturner@wiley.law) is a partner in the Telecommunications, Media, and Technology practice of Wiley in Washington, D.C. He co-chairs the firm’s Unmanned Aircraft Systems practice group and has extensive experience litigating in federal courts on issues related to federal preemption. He recently completed a term as president of the Federal Communications Bar Association.

Sara M. Baxenberg (sbaxenberg@wiley.law) is an associate in Wiley’s Telecommunications, Media, and Technology practice, where she focuses on regulatory and litigation work related to wireless telecommunications and emerging technologies, including unmanned aircraft systems.

coelum property rights were allowed to persist, “every transcontinental flight would subject the operator to countless trespass suits.”⁷ The Court was able to reach this position in part because of the extent to which the federal government had already occupied the fields of air navigation and aviation safety as of 1946. As the *Causby* Court observed, the Air Commerce Act of 1926 established both “the complete and exclusive national sovereignty in the air space” held by the U.S. government and the “public right of freedom of transit . . . through the navigable airspace of the United States” held by every U.S. citizen.⁸ As a result, the Court found, “the airspace is a public highway,” and private trespass claims must give way or “private claims to the airspace would clog these highways, seriously interfere with their control and development in the public interest, and transfer into private ownership that to which only the public has a just claim.”⁹

Federal primacy in the areas of air navigation and air safety has only grown in the post-*Causby* era. In 1958, in the wake of a series of air disasters caused by poor coordination, the Federal Aviation Act established the FAA (originally called the Federal Aviation Agency) and began transferring the authority of the precursor Civil Aeronautics Authority to the new agency.¹⁰ The FAA was charged with, among other responsibilities, “formulat[ing] policy with respect to the use of the navigable airspace”; “assign[ing] by rule, regulation, or order the use of the navigable airspace”; and, in so doing, ensuring “the safety of aircraft and the efficient utilization of such airspace.”¹¹ As the FAA developed pervasive regulatory frameworks governing nearly every aspect of aircraft operation, the U.S. airspace developed into one of the most crowded and complex in the world—but, critically, also the safest.

Property Rights Advocates Overread *Causby* and Misunderstand Aviation Law

In the modern debates over ownership of the airspace that have emerged in the age of drones, property rights advocates assert that *Causby* and federal law pertaining to airspace access actually *compel* the conclusion that property owners have a right to exclude drones from the airspace above their property. But there are at least four key points that property rights advocates either overlook or just get wrong.

Causby Did Not Establish a Property Right in Airspace Property rights advocates often assert that *Causby* established a property right in the airspace above a person’s real property. In so doing, they pull two quotes from the opinion: first, “the landowner . . . must have exclusive control of the immediate reaches of the enveloping atmosphere”; and, second, “the landowner, as an incident to his ownership, has a claim to [the superadjacent airspace] and . . . invasions of it are in the same category as invasions of the surface.”¹²

However, these quotes cannot be divorced from their context or the ultimate holding of the case. The ellipses in the first quote hold an important qualification. The quote in full is: “[I]t is obvious that *if the landowner is to have full enjoyment of the land*, he must have exclusive control of the immediate reaches of the enveloping atmosphere.”¹³ The full quote makes clear that it is only in the context of enjoyment of the *land* that a property owner has any control over the airspace at all. Similarly, the sentence that directly precedes the second quote is: “The superadjacent airspace at this low altitude is so close to the land that *continuous invasions of it affect the use of the surface of the land itself*.”¹⁴ Thus, *Causby* makes plain that the only “claim” that a property owner has in regard to airspace occurs when frequent flights within the airspace affect the use of the ground.¹⁵ Read in context, these cherry-picked statements are entirely consistent with the aerial trespass doctrine and do not support the notion that a landowner has a property right in the airspace itself.

Other parts of *Causby* reinforce this, as the Court repeatedly focused on a landowner’s ability to make use of the land and nowhere suggested an absolute right to exclude aircraft. For instance, in discussing control of the “immediate reaches,” the Court observed that if such control did not exist, “buildings could not be erected, trees could not be planted, and even fences could not be run.”¹⁶ If property owners had an absolute right in the airspace above their land, the impact on the use of the land below would simply be irrelevant to the analysis.

Finally, the holding in *Causby* confirmed that it is the interference with the use of the land—not simply intrusion in the airspace—that constitutes the taking of property. The Court’s holding was that the specific flight operations at issue, which involved repeated, low-altitude flights by military aircraft using an airport located less than 2,500 feet from the Causby family’s property, effected a taking, specifically because the overflights were “so low and so frequent as to be a direct and immediate interference with the enjoyment and use of the land.”¹⁷ Any discussions of what property rights might exist in other circumstances are, at best, dicta.

Causby Does Not Support an Altitude-Based Definition of “Immediate Reaches” of Property

Property rights advocates are also quick to note the

***Causby* confirmed that interference with the use of the land—not simply intrusion in the airspace—constitutes the taking of property.**

The airspace in which the FAA permits UAS to fly constitutes navigable airspace within the meaning of federal law.

specific altitudes of the flights at issue in *Causby*, and they often suggest that these support designating altitude-based lines in the sky under which a property owner can exclude any aircraft that transits the property. This argument not only makes the analytical misstep of divorcing intrusion into the immediate reaches—the first prong of aerial trespass—from the necessary second prong of interference with the use and enjoyment of the land, but it also injects far more specificity into the “immediate reaches” concept than the Court was willing to establish. Indeed, while the Court noted that the overflights at issue took place 83 feet above ground level and that these flights took place in the “immediate reaches” for purposes of the takings analysis, the Court left open the questions of how low or high the immediate reaches extend and, importantly, whether their boundaries are absolute or they vary depending on the nature of the intruding aircraft or the intrusion it commits.

Property rights advocates often overlook the important role that recognition of technological advances and federal primacy played in the *Causby* decision. These concepts have much to lend to the discussion about airspace rights in the era of drones.

Federal Sovereignty and Technological Evolution Were Central to the Court’s Decision

Property rights advocates often overlook the important role that recognition of technological advances and federal primacy played in the *Causby* decision. These concepts have much to lend to the discussion about airspace rights in the era of drones.

First, just as the advent of manned aviation led the *Causby* Court to reject the *ad coelum* doctrine, the unique capabilities and features of small UAS and the public interest in enabling scalable UAS operations may well similarly require evolutionary thinking about what it means to own a piece of land.

Second, the federal primacy in airspace regulation that the *Causby* Court identified has only intensified in the decades following the decision as the airspace has grown more complex and the regulatory frameworks more robust. This environment underscores the need for federal control of the airspace that cannot, as a matter of law, and should not, as a matter of policy, be eroded by the trespass claims of property owners.

FAA Has Regulatory Authority Over, and Operators Have a Right to Transit, “Navigable Airspace”

In asserting that the law supports a right to exclude UAS, property rights advocates also tend to misconstrue the concept of “navigable airspace.” As the *Causby* Court recognized, the right to air navigation adopted by the Air Commerce Act of 1926 extends to

“navigable airspace,” which is defined today in the U.S. Code as the “airspace above the minimum altitudes of flight prescribed by regulations under [certain portions of Title 49 pertaining to air commerce and safety], including airspace needed to ensure safety in the takeoff and landing of aircraft.”¹⁸ Because part 91 of the FAA’s rules defines “minimum safe altitudes” for aircraft as 500 or 1,000 feet, depending on whether the area is sparsely or densely populated,¹⁹ and because the regulations governing UAS contain no parallel provisions expressly establishing a “minimum altitude” for drones, property rights advocates argue that the area below 500 feet is not actually navigable airspace, and, accordingly, aircraft do not have a right of transit. As such, property rights advocates contend, landowners and municipalities have a right to exclude.

This hypertechnical argument misunderstands the concept of navigable airspace, the policy objectives it seeks to achieve, and the scope of federal authority. Indeed, by focusing solely on the 500-foot provision in section 91.119, property rights advocates overlook the fact that the FAA defines “minimum altitudes”—using that precise term—in a number of different regulations covering a number of different contexts.²⁰ Indeed, section 91.119 itself imposes two *different* minimum altitudes—one for sparsely populated areas and one for congested areas. To identify all of the regulations that establish a minimum altitude, pluck out the lowest number, and call that “the” minimum altitude for the purpose of the definition of “navigable airspace” gravely misunderstands the concept of navigable airspace. It is not one immutable thing but rather a dynamic concept that varies depending on the risk posed by a particular operation: navigable airspace for aircraft in congested areas is different from navigable airspace for aircraft using autopilot is different from aircraft operating near the Grand Canyon.²¹

And for good reason: the public interest in air navigation diminishes rapidly if the operations cannot be conducted safely. Thus, the legislative definition of “navigable airspace” is not intended to divide the airspace where operators can fly, and the FAA can regulate from the airspace in which landowners and municipalities can exert control. Indeed, as set forth above, the federal government has exclusive sovereignty over *all* airspace, not just navigable airspace,²² and the FAA similarly has authority over the use of all airspace to ensure “the safety of aircraft and the efficient use of airspace.”²³ The reason that federal law recognizes navigable airspace at all is not to observe or protect the rights of property owners, but instead to ensure the safety of aircraft operations.

It is thus plain that the airspace in which the FAA permits UAS to fly—the ground to 400 feet for small UAS, subject to the FAA’s duly promulgated part 107 regulations—constitutes navigable airspace within the meaning of federal law. The regulations do not

prescribe a minimum altitude for small UAS because, unlike typical manned aircraft that weigh hundreds or thousands of times more than a max-55-pound small UAS, there is no altitude in that range at which UAS operations are per se unsafe. It is of no moment that the FAA did not adopt a regulation that sets a “minimum altitude” for small UAS at zero feet: the airspace in which FAA regulation permits UAS operation is, by definition, navigable airspace for UAS.

The ULC Draft UAS Trespass Law Attempted to Maintain the Causby Balance; Eleventh-Hour Efforts by Some Property Rights Advocates Derailed the Process

In 2019, the Uniform Law Commission (ULC)—a national organization that develops proposed state laws in areas that could benefit from uniformity—developed a draft trespass law to apply to UAS overflights. Although the first draft of the model law would have established a 200-foot line in the sky under which UAS flights conducted without permission of the property owner would have constituted a per se trespass, the final proposal hewed much more closely to the existing aerial trespass doctrine.

The first draft of the ULC’s proposal²⁴ drew criticism from a wide range of stakeholders²⁵—including the FAA itself²⁶—raising concerns about the shift in law that it represented. The committee responsible for drafting the law took these concerns seriously, engaging in thoughtful debate with a variety of stakeholders, including representatives from industry and think tanks.

The committee also wrestled with whether to include separate provisions related to invasions of privacy. As with trespass, the committee’s initial instinct was to prescribe rigorous new rules that would have subjected UAS to more exacting standards than existing law applied to similar conduct or technologies. After lengthy discussions, the committee concluded that this technology-specific approach was inappropriate. The committee noted that states take different approaches to safeguarding privacy and that it was better to give states the flexibility to apply these frameworks to drones rather than try to mandate a unique, uniform approach that would upend existing privacy laws.

With respect to trespass, the committee ultimately produced a compromise proposal that would have required that a UAS flight substantially interfere with the use and enjoyment of the property to constitute a trespass and would have provided a multifactor test to help courts determine whether an aerial trespass via drone had occurred.²⁷ The numerous factors proposed in the “substantial interference” test recognized the possibility that drones could substantially interfere with property use in ways unique to their capabilities, even if they caused significantly less disturbance to the underlying property than that at issue in *Causby*—a recognition that the existing aerial trespass doctrine in

no way required. Far from being a giveaway to industry, the end result was a true compromise between the positions of various stakeholders: for instance, the proposal focused entirely on interference with the use and enjoyment of the land, altogether omitting the first prong of the aerial trespass doctrine that requires an intrusion into the immediate reaches of property.

The ULC’s proposal offered a promising approach for applying the aerial trespass doctrine to drones. However, shortly before the proposal was to be voted on by the full ULC, a coalition of property rights advocates launched a campaign against the proposal.²⁸ These advocates sought a complete rewrite of the proposal and fundamental alteration of existing law. For instance, one last-minute commenter asserted that “[t]here needs to be a zone into which a landowner may prohibit any entry by drones and a means to identify the particular drone operator for any drone operating outside the ‘no fly area.’”²⁹ Another recommended either a return to the per se trespass “line in the sky” approach from the rejected first draft or a presumption of substantial interference when operations are conducted at an altitude below the tallest structure on a given piece of property³⁰—a wholly unworkable standard. In support of his assertion that the ULC proposal was a “radical departure from existing law,” another commenter even offered that “the adoption of the *Causby* dictum in Section 159(2) of the *Restatement Second of Torts* is not to be taken literally[.]”³¹

Ultimately, this last-minute campaign, coupled with the significant changes the committee made to the initial “line in the sky” draft presented the year before, caused the ULC to withdraw the proposal before it was called for a vote at the Commission’s annual meeting.

Rewriting Property Law May Have Grave Consequences for the Future of Aviation Safety and Technological Innovation

The failure of the ULC process will not be the end of the story. Property rights advocates have continued their attempts to rewrite the law to enable landowners to exclude drones from the airspace above their property.

If successful, these proposals will erode federal primacy in the airspace, introducing millions of new de facto air traffic controllers in the form of individual property owners, and pave the way for a patchwork of local airspace regulation, jeopardizing aviation safety. Such actions also will thwart the ability to conduct scalable UAS operations, threatening the future of the UAS industry and the numerous public benefits it would provide—the value of which are particularly evident as the nation grapples with a global pandemic.

Ironically, to the extent that these efforts to protect property rights are actually motivated by concerns about privacy, drawing lines in the sky is a blunt and ineffective tool to address those issues. A drone operating at 201 feet can take the same pictures as a drone at 199 feet.

The best outcome for all stakeholders is one that seeks to thoughtfully apply the existing aerial trespass doctrine to the novel issues presented by drones, rather than upending decades of law and starting from scratch. This approach requires introspection on all sides of the debate, including careful consideration of the nature of property rights in light of this new technology, the unique ways in which drones can affect the use and enjoyment of property, and the ways in which the exercise of property rights affects the federal system of air navigation. Otherwise, we may well end up with laws that leave drones grounded entirely; in this new technological era, “common sense revolts at the idea.”³²

Endnotes

1. 328 U.S. 256 (1946).
2. *Id.* at 267.
3. RESTATEMENT (SECOND) OF TORTS § 159(2) (1965) (emphasis added).
4. *See, e.g.,* Pueblo of Sandia *ex rel. Chaves v. Smith*, 497 F.2d 1043, 1044–45 (10th Cir. 1974) (granting summary judgment against plaintiff suing airport for trespass regarding airplanes regularly crossing over plaintiff’s land “at heights of 150 feet or less” because plaintiff failed to show “substantial interference with the actual use of [plaintiff]’s land”); *Beverly v. Gaylord Broad. Co., L.P.*, No. 05-01-00895-CV, 2002 WL 1582286, at *6 (Tex. App. July 18, 2002) (reversing grant of summary judgment for trespass claim against helicopter operator because “evidence of a single ten-minute hover over her property at 300 to 400 feet does not, as a matter of law, rise to the level of ‘substantial interference’ with the use and enjoyment of the underlying land”).
5. *Causby*, 328 U.S. at 260–61.
6. *Id.* at 266.
7. *Id.* at 261.
8. *Id.* at 260 (citing 49 U.S.C. §§ 176(a), 403). (These concepts have since been recodified in slightly different language at 49 U.S.C. § 40103(a).)
9. *Id.* at 261.
10. Federal Aviation Act of 1958, Pub. L. No. 85-726, 72 Stat. 731, 744, § 301.
11. *Id.* at 749, § 307.
12. *Causby*, 328 U.S. at 264–65.
13. *Id.* at 264 (emphasis added).
14. *Id.* at 265 (emphasis added).
15. *Id.*
16. *Id.* at 264.
17. *Id.* at 267.
18. 49 U.S.C. § 40102(32).
19. 14 C.F.R. § 91.119(b), (c),
20. *See, e.g., id.* §§ 91.177 (establishing minimum altitudes for aircraft operating under instrument flight rules), 93.307 (aircraft operating near Grand Canyon National Park), 121.579 (aircraft using autopilot).
21. *Id.* §§ 91.77; 121.579; and 93.307.
22. 49 U.S.C. § 40103(a)(1).
23. *Id.* § 40103(b)(1).
24. Nat’l Conference of Comm’rs on Uniform State Laws, Tort Law Relating to Drones Act (Mar. 9–11) (2018 Drafting Committee Meeting), <https://www.uniformlaws.org/viewdocument/march-2018-committee-meeting-draft-1?CommunityKey=2cb85e0d-0a32-4182-adee-ee15c7e1eb20&tab=librarydocuments>.
25. *See, e.g.,* Letter from Associations and Companies Representing Unmanned Aircraft Industries to Anita Ramaswamy, Uniform Law Comm’n (July 5, 2018), <https://www.uniformlaws.org/viewdocument/comments-associations-and-compani?CommunityKey=2cb85e0d-0a32-4182-adee-ee15c7e1eb20&tab=librarydocuments>.
26. Letter from Steven Bradbury, Gen. Counsel, Dep’t of Transp., and Charles Trippe Jr., Chief Counsel, Fed. Aviation Admin., to Paul Kurtz & Mark Glaser, Chair & Vice Chair, Respectively, Tort Law Relating to Drones Comm., Nat’l Conference of Comm’rs (July 11, 2018), <https://www.uniformlaws.org/viewdocument/comments-s-bradbury-dept-of-tr?CommunityKey=2cb85e0d-0a32-4182-adee-ee15c7e1eb20&tab=librarydocuments>.
27. *Id.*
28. *See, e.g.,* Letter from the Joint Editorial Bd. for Uniform Real Property Acts to Comm’rs, Uniform Law Conference (June 5, 2019) [hereinafter JEBURPA Letter], <https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=a22024a3-ad6c-5f2d-a96c-1e6981b32cba&forceDialog=0>; Letter from Henry E. Smith, Fessenden Professor of Law & Reporter, Am. Law Inst.’s Restatement Fourth of the Law, Property, to Nat’l Conference of Comm’rs on Uniform State Laws (June 20, 2019) [hereinafter Smith Letter], <https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=44cb6696-a733-81f8-c9da-fb5c47852d59&forceDialog=0>; Letter from Jo-Ann Marzullo, Section Chair-Elect, Real Prop., Trust & Estate Law Section, Am. Bar Ass’n, to Comm’rs, Uniform Law Conference (June 27, 2019) [hereinafter RPTE Letter], <https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=1f86816b-aff6-2b3a-5a3c-baf2f1a9146a&forceDialog=0>; Letter from Am. Coll. of Real Estate Lawyers to Comm’rs, Uniform Law Comm’n (July 3, 2019), <https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=170e1617-b926-16f6-1bb8-e6a222c375cf&forceDialog=0>.
29. RPTE Letter, *supra* note 28, at 2.
30. JEBURPA Letter, *supra* note 28 at 2–4.
31. Smith Letter, *supra* note 28, at 1, 4.
32. *United States v. Causby*, 328 U.S. 256, 261 (1946).

referred to as drones, is forcing state legislators, practitioners, and legal scholars to examine the reach and application of the trespass doctrine and the right to privacy. This article addresses recent developments in the law pertaining to trespass and the right to privacy associated with drone operations. While identifying the developments, the article advances the position that we must protect trespass and the right to privacy, as tort claims from erosion as recreational and commercial drone use grows and becomes commonplace.

Trespass

What is a trespass? *Trespass* is defined as an entry onto another's land without permission, irrespective of any damage caused.¹ The schoolkids cutting across the elderly man's lawn illustrates a trespass. The kids cross the land without permission of the landowner; thus, their mere entry onto the land constitutes a trespass. Trespass is an intentional tort, and, from a policy perspective, the kids' intrusion onto the owner's property without permission entitles the owner to damages because of the infringement of the property owner's right to exclude.

When a drone replaces the kids in the hypothetical, then the trespass analysis becomes tortured because the drone never physically touches the land but instead encroaches into the airspace immediately above the land. Logic suggests that the historical, land-based tort of trespass should apply when a drone penetrates the immediate, reachable airspace above a property owner's land just as if the drone had actually touched the ground. Thus, when an object intrudes into the airspace above their land, landowners ordinarily assume that a trespass has occurred. But that is not necessarily the case in today's law.

In reliance in large part on the *Restatement (Second) of Torts*, the traditional trespass doctrine does not apply when a drone invades only a property owner's airspace. Instead, the trespass doctrine that makes sense when a physical touching occurs gives way to the tort of aerial trespass, which applies to the right of a drone operator to operate through the navigable airspace above the land.² At this point in the law, the analysis becomes more complicated.

The foundation for distinguishing the trespass doctrine from an aerial trespass comes from *United States v. Causby*, a seminal constitutional law case widely known for its holding on the Takings Clause of the Fifth Amendment to the U.S. Constitution.³ In *Causby*, the U.S. government leased an airfield adjacent to a chicken farm operation. The government used the airfield to train bombers prior to deploying them for combat in the European theater during World War II. As part of the operations, the bombers flew low-level approaches into the airspace directly above the chicken farm. The

bombers flew so low that they barely cleared the treetops on some occasions. The noise and vibrations emanating from continuous bomber-training operations had a deleterious effect on the chicken farm's operations. The most vivid consequence was that the chickens were frightened out of their minds—literally. The chickens got so scared that they ran at top speed into the sides of buildings on the farm, killing themselves—historical poultricide. As a result of the loss of revenue, the Causbys sued the federal government, arguing that the intrusion of bombers into the airspace above their real property constituted a taking under the Fifth Amendment requiring compensation. The court agreed.

A companion argument advanced by the Causbys in the lower courts was that the bombers committed a common law trespass through the airspace above their land. The formulation of the Causbys' argument on trespass was based on the common law *ad coelum* doctrine, which advances the notion that ownership of real property includes the airspace above the land up to the edges of the atmosphere.⁴ The Causbys, in reliance on this doctrine, argued that the bombers' transit through this envelope of airspace above their land constituted a trespass. The trespass issue was not before the Supreme Court, and the *Causby* opinion is therefore grounded in the Takings Clause and not the trespass claim. However, the Supreme Court made references to the trespass doctrine in the *Causby* opinion. The Court, in dicta, rejected the *ad coelum* doctrine but recognized that real property owners' rights of ownership extended to the "superadjacent" airspace or "at least as much of the space above the ground as they can occupy or use in connection with the land."⁵ The Court also acknowledged that aircraft flight was considered to be lawful unless the altitude was so low that the flight path interfered with the existing use of the land or the flight path posed an imminent danger to persons or property on the land. Building upon this language, the Court recognized that aircraft skimming along the surface of the land,

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Ronnie R. Gipson Jr. (rrgipson@memphis.edu) is a visiting assistant professor at the University of Memphis Cecil C. Humphreys School of Law. Gipson is a fixed-wing private pilot who spent a decade representing different stakeholders in the aviation industry. He is now an aviation law scholar who provides policy advice to the aviation industry.

but not touching the land, intruded upon the landowner's use and enjoyment of the land to the same extent as a physical trespass at ground level. From this combination of holdings, the term *aerial trespass* was born; however, a uniform definition remains illusory when moving among different jurisdictions.

The *Causby* opinion acknowledged that although the navigable airspace was placed in the public domain, the landowners retained ownership of the airspace above their property that can be occupied or used in connection with the land.⁶ The result was an implied but recognized buffer zone between the airspace next to a landowner's property interests and the navigable airspace utilized by the federal government.⁷

The boundaries of the buffer zone became defined by the Federal Aviation Regulations (FARs), which set the floor for navigable airspace at 500 feet above the ground. Aircraft are not permitted to operate below this altitude unless maneuvering for takeoff and landing. Exceptions exist to allow some fixed-wing operations below this 500-foot floor, but those exceptions contain further restrictions such as minimal distances from people, objects, and buildings, and helicopter operations that are at a safe distance and without hazard to persons or property.⁸

In 2016, the Federal Aviation Administration (FAA) released its final rule on drone operations, which established a hard ceiling of 400 feet for the operation of drones as long as those operations are far enough away from landing and departing aircraft. The 400-foot altitude was selected to provide a vertical safety buffer zone between unmanned flight operations and manned flight operations, which may be permitted to descend to 500 feet. Prior to the issuance of the FAA's final rule on drone operations, and consistent with the holding in *Causby*, the area of airspace below what the FAA arguably defined as navigable airspace was considered within the purview of the states, giving rise to common law claims consistent with the Tenth Amendment.⁹ With this revised segregation of airspace defined by the FAA's final rule on drones, modern-day technology now imposes the transit of drones through the landowner's superadjacent airspace. Drones in compliance with regulations now legally transit through airspace that sits within the ambit of the landowner's envelope of protection.

From a strict tort law perspective, drones that operate through this superadjacent airspace commit a

trespass, violating landowners' rights. The FAA relegation of drones to airspace not previously designated for aircraft flight by the federal government thus increases the pressure to reevaluate and demarcate the boundary between what is now usable navigable airspace and a landowner's superadjacent airspace envelope.

Recognizing the enormity of the change that drones bring to this area of tort law, the Uniform Law Commission (ULC) set out to construct a model tort law called the Uniform Tort Law Relating to Drones Act (Draft Model Act).¹⁰ It is important to note that once the ULC finalizes the Draft Model Act, the proposal will then be submitted to the several states as a uniform tort scheme pertaining to drones. The states will then choose whether or not to adopt the Draft Model Act in whole or in part into their statutory scheme.

In 2018, the ULC released the first Draft Model Act, seeking comment from interested stakeholders. The initial Draft Model Act stated that liability for trespass infringements against the property owner rested with the drone operator. Another important tenet of the initial Draft Model Act was the establishment of a 200-foot shelf above a landowner's property as the upper limit of the immediate reaches of airspace consistent with *Causby*. The initial proposal took the position that the mere presence of a drone within this protected area constituted a per se injury. The drone industry balked at the 200-foot shelf. In 2019, the ULC drafting committee met and revised the Draft Model Act, removing the per se injury tied to the 200-foot shelf to provide greater operational flexibility for drone operators. The drone industry quickly lauded the removal of the 200-foot shelf.¹¹

With the 200-foot restriction absent, the Draft Model Act now contains language that defines a drone passing through airspace above private property as an aerial trespass in line with the *Restatement* but in contravention of the protections set forth in *Causby*.¹² A key component of the proposed aerial trespass doctrine is the requirement for the overflight of the drone to substantially interfere with the land use below. Specifically, the Draft Model Act proposes the following factors to consider in order to assess whether or not an aerial trespass has occurred:

- the amount of time the drone was over the landowner's property;
- the altitude of operation;
- the number and frequency of times that the drone has been operated over the property;
- the time of day of the operation;
- the operator's purpose in operating the drone over the property;
- physical damage caused by the drone operation;
- economic damage caused by the drone operation;
- whether or not the drone was seen or heard over the property;

The boundaries of the buffer zone became defined by the FARs, which set the floor for navigable airspace at 500 feet above the ground.

- whether or not the drone captured audio, video, or photographs; and
- whether or not the landowner has regularly allowed the operation of drones over the property.

Instead of a trespass analysis, the factors proposed by the ULC look more like the analysis for determining whether a Fifth Amendment taking has occurred as in *Penn Central Transportation Co. v. City of New York*.¹³ In *Penn Central*, the owner of Grand Central Terminal applied for permission to build an office building above the historic terminal. The City of New York denied the application in order to preserve the historic nature of the terminal. The owner argued that the denial of the application by the city amounted to a regulatory taking and filed suit seeking compensation under the Fifth Amendment to the Constitution. The case made its way to the U.S. Supreme Court, which used the case to set forth factors to determine whether a regulatory taking has occurred.¹⁴

A multifactor analysis akin to establishing a regulatory taking is an inappropriate construct for analyzing whether a trespass by a drone has taken place because the policy aims are drastically different and there is no government actor in the case of the trespass. To continue down the path of defining an aerial trespass as one that happens only when harm occurs comports with the language in the *Restatement*, but this approach ignores the landowner's rights to pursue a trespass claim for intrusion into the superadjacent airspace, as acknowledged in *Causby*. In *Causby*, the Court wrote, "We think that the landowner, as an incident to his ownership, has a claim to it [superadjacent airspace] and that invasions of it are in the same category as invasions of the surface."¹⁵ With this language, the Court signaled that the landowner's property rights against trespass continued to reach into the superadjacent airspace. The original language in the 2018 version of the Draft Model Act imposed a hard barrier to prevent a trespass from ever occurring, which, however slight, was consistent with *Causby*. In contrast, the introduction of factors to consider in the revised 2019 version of the Draft Model Act addresses the trespass after the event occurs. The introduction of a multifactor test removes the analysis from the realm of trespass and inappropriately places it into the sphere of a takings analysis. It is amazing that an opinion written in 1946 continues to be hotly debated almost 75 years later.

If the provision on trespass in the current version of the Draft Model Act remains unchanged in the final version transmitted by the ULC to the states, then the onus for protecting landowners' trespass rights will rest with the states. State legislatures that disagree with the ULC and wish to apply the traditional *trespass* definition to aerial intrusions can achieve this protection by refusing to adopt the Model Act. Instead,

they can take existing tort schemes and extend those to laws to cover drone operations in order to achieve the necessary level of protection for everyone impacted. The ULC drafting committee should take heed and seek to create a better balance in the language of the Draft Model Act among the competing interests of property owners, drone operators, and the drone industry on the trespass issue. The balanced solution involves eschewing the takings analysis for drone entry into airspace above property and embracing the true definition of *trespass*, which recognizes an entry into the immediate airspace reaches of a property owner as a compensable per se injury.

Right to Privacy

Based on the *Restatement*, privacy consists of a mixture of different rights. The privacy interests protected in tort law include the right to be free from (i) an unreasonable intrusion of a person's seclusion, (ii) the appropriation of a person's name or likeness, (iii) unreasonable publicity given to one's private life, and (iv) publicity that places one in a false light before the public.¹⁶

The infringement of the first privacy right occurs when drones pass through a landowner's airspace. The pass-through represents an unreasonable intrusion on a person's seclusion. If the drone is equipped with a video camera, then the drone's capture of images or video footage without permission infringes on the privacy right of the subject of the images by giving unwanted and unauthorized publicity to a person's private life.¹⁷ In crafting public policy on a drone's privacy intrusion, concerns about the protection of privacy rights of the populace at large come to the forefront of the discussion.

In the Draft Model Act, the ULC charted a path that seeks to avoid offering a model tort law that is directed at a specific technology or that singles out drones when it comes to privacy concerns. Instead, the ULC advances the idea that state laws on privacy are adequate. Only time will tell as technology advances whether or not the ULC's deference to the states on the issue of privacy is a wise one.

The issues of trespass and privacy are intertwined. For this reason, landowners have difficulty separating their trespass claims from their privacy claims. This difficulty is evident in cases where one right is advanced as a cause of action while the other right lurks in the background and yet drives the outcome.

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An incident from Ulster, New York, in 2014 demonstrates the degree to which a drone may be said to invade privacy and the need to craft clear policy positions that protect privacy rights as technology advances.¹⁸ In this incident, a man dropped off his mother at the doctor's office for a medical appointment. The man then flew his drone equipped with a camera, taking photos and video footage of the exterior of the medical building as a means to promote his videography enterprise. None of the pictures or video captured showed either the interior of the building or patients. Nonetheless, the drone operator was tried criminally for unlawful surveillance. The statute used to charge the drone operator contained language

specifically stating that the purpose of the law was to protect innocent persons' privacy by preventing others from filming them without authorization.

Although the defendant in the Ulster incident did not intend to violate any individual's privacy, this event shows the potential harm that can occur as a result of the actions of a drone operator who has no respect for the potential privacy interests of those who might be impacted by the presence of a drone. Consider a circumstance where a drone operator conducts the same type of flight but with the purpose of capturing the identity of people submitting them-

selves for treatment at a plastic surgery facility, a family planning facility, or a cancer treatment facility. The mere presence of the patients at those facilities may not be information that the patients want in the public domain through the internet or social media platforms. Only the implementation of strong privacy laws that disincentivize this type of behavior will serve to protect the population's privacy rights from rogue drone operators.

Landowners Versus the Nascent Drone Industry

The emergence of drones into our society is a recent phenomenon. With any new and developing technology, the legal policy-making often lags behind. UAS/UAV technology is no different. What we are seeing is that while incidents involving drones make their way into the news and onto the internet, those incidents rarely make their way to the trial and appellate courts. As a result, there are very few matters that can start to frame the law in this area, good or bad.

The first noteworthy incident occurred in 2017 in New York between two neighbors.¹⁹ The drone

operator was a teenage boy who received the drone as a Christmas gift. The boy flew the drone over the house of his neighbor, who then complained. That interaction between the neighbors did not go well, and no agreement to alter the drone's flight path was reached. The boy reportedly flew the drone over the neighbor's house an additional 13 times over the next six months. Applying the traditional *trespass* definition, the boy's drone trespassed over the neighbor's property a total of 14 times. Applying the Draft Model Act's *aerial trespass* definition, although an intrusion into the neighbor's airspace occurred, no compensable injury occurred. The landowner relied on the traditional *trespass* definition and acted accordingly. Each time that the drone appeared over her property, the neighbor called the police. The incident escalated beyond acceptable societal norms when the neighbor abused her official government position as a deputy corrections office commissioner by setting up a special detail at her house to arrest the teenage boy and his father.

The lengths to which this neighbor went in order to prevent the trespass of the drone over her house and to protect her privacy rights is a testament to the seriousness of the disputes that arise when opposing rights come into conflict. The event shows the importance of the need for clear and easily understood rules to protect trespass and privacy rights in order to avoid a legal climate where landowners resort to self-help measures to vindicate their rights.

Another incident also involved feuding neighbors but added the element of gunplay. In this 2015 unpublished California case,²⁰ the drone operator was flying his homebuilt drone for the first time when his teenage neighbor shot it down with a shotgun. The drone owner's ensuing exchange of emails with the teenager's father did not resolve the matter. The drone owner filed a small claims suit seeking payment for the homebuilt drone. In this instance, there was a genuine disagreement as to whether or not the drone was flying over the drone operator's farm or the neighbor's farm. Regardless of the dispute about the drone's location, the neighbor cited privacy concerns as one of the motivating factors legitimizing the destruction of the drone. In one of the emails sent by the father to the drone operator, he wrote, "Perhaps in SF [San Francisco] it is normal for folks to have drones hovering over their property but we live in the country for privacy."²¹ At trial in county court, the neighbor indicated that the shooting of the drone was justified because he wanted peace and quiet in his neighborhood. The court awarded the drone owner \$700 and attorney fees of \$150.

In another unpublished opinion, the California Court of Appeal dealt with the issues of privacy and trespass directly relating to drone operations.²² Here, once again, neighbors got into a disagreement after the drone operator used his drone to fly over the neighbor's property using a preprogrammed route to surreptitiously take

The example of schoolkids cutting across a lawn no longer suffices to illustrate tort law doctrines such as trespass and privacy.

photographs of his neighbor's property. The drone's flight path invaded the neighbor's superadjacent airspace (trespass) and was used to capture images without permission (right to privacy infringement). At trial, the court found that the drone's flight path was a trespass and an invasion of privacy. The court awarded damages, attorney fees, and costs to the neighbor whose property was the subject of the unauthorized photography. This decision was affirmed on appeal.

Conclusion

When citizens feel that their privacy rights and property interests are threatened, they may take matters into their own hands, and their actions may have real-world implications. Policy makers must step in and create sensible laws that achieve the dual purpose of (1) protecting landowners' rights against trespass and citizens' rights against privacy invasions by drone operators and (2) protecting drone operators' rights to fly their craft in the airspace as designated by the FAA.

The 2019 version of the ULC's Draft Model Uniform Tort Law Relating to Drones Act achieves this goal for property owners only on the issue of privacy, but the Act falls short in balancing stakeholders' interests on the issue of trespass. The ULC should go back to the drawing board and revive the 200-foot barrier as the demarcation line between property owners' airspace and the airspace within which drone operators are allowed to fly drones above private property. The 200-foot hard shelf is understandable to the general public, and it is an easy limitation to teach, to examine for licensure purposes, and to enforce with drone operators. Equally important, the 200-foot hard shelf comports with the language in *Causby* and with the layperson's understanding and extension of the trespass doctrine to the airspace above landowners' land.

As for future law school students, the example of the schoolkids who cut across the elderly man's lawn will no longer suffice to illustrate and teach tort law doctrines such as trespass and privacy. Instead, tort law professors will need to create hypotheticals that include bickering neighbors, salacious images captured by drones, and shotguns used to assert

landowners' rights. It almost makes me want to sit in the student's seat again.

Endnotes

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2. Kyle Joseph Farris, *Flying Inside America's Drone Dome and Landing in Aerial Trespass Limbo*, 53 VAL. U. L. REV. 247, 248–49 (Fall 2018); see also RESTATEMENT (SECOND) OF TORTS, *supra* note 1, § 329.
3. *United States v. Causby*, 328 U.S. 256 (1946).
4. Farris, *supra* note 2, at 249; see also RESTATEMENT (SECOND) OF TORTS, *supra* note 1, § 159 cmt. g.
5. *Causby*, 328 U.S. at 264–65.
6. *Id.* at 264.
7. Farris, *supra* note 2, at n.52.
8. 14 C.F.R. § 91.119 (2020).
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10. (UNIF. LAW COMM'N 2019), <https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=5bbdd6ae-9c3f-7a80-6a0f-6cdf54dbfe9e&forceDialog=0>.
11. Brian Wynne et al., *New Approach to State Drone Laws Balances Privacy and Innovation*, TECHCRUNCH (July 3, 2019).
12. RESTATEMENT (SECOND) OF TORTS, *supra* note 1, §159(2), § 329.
13. *Penn Cent. Transp. Co. v. New York*, 438 U.S. 104 (1978).
14. *Id.*
15. *United States v. Causby*, 328 U.S. 256, 265 (1946).
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18. Jessie Smith, *Criminal Surveillance or Innocent Droning?*, HUDSON VALLEY ONE, May 1, 2015.
19. Reuven Blau, *Corrections Department Official Used Jail Officers to 'Intimidate' Teen as Rikers Manhunt Kicked Off*, DAILY NEWS, Mar. 5, 2018.
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22. *Glaser v. Mitchel*, No. A155815, 2019 Cal. App. Unpub. LEXIS 7424 (Cal. Ct. App. Nov. 7, 2019).



The Challenges to Urban Air Mobility

By Jeffrey J. Immel and Jonathan Alexander Langlinais



Time is money, and time spent in traffic is money wasted. In 2013, the United States, Germany, France, and the United Kingdom lost a combined \$200 billion in costs associated with traffic congestion, and that cost is expected to rise to \$293 billion by 2030.

Annual hours wasted in traffic are expected to rise by six percent over that same time period.¹ According to a white paper published by Uber Elevate in 2016, the average San Francisco resident spent 230 hours commuting between work and home in 2015, which amounts to half a million hours of productivity lost every single day.² Meanwhile, Los Angeles residents spend roughly two workweeks each year stuck in traffic commuting to work.³ Consumers and businesses have powerful incentives to find solutions to this growing problem of wasted productivity.

One concept rapidly gaining traction as a solution is urban air mobility (UAM). Somewhat like the “flying cars” of popular imagination, UAM aircraft would provide on-demand, highly automated, passenger or cargo-carrying air transportation services within and around a metropolitan environment. Rather than take a car and fight crowded interstates and surface roads, UAM would allow an individual to take an aircraft from point A to point B. Typically, UAM proposes using electrically powered, vertical takeoff- and landing-capable (eVTOL) aircraft. Often, the concept involves highly automated aircraft that may come without any human pilot.

Overview

While the technology that underpins UAM is novel, the concept of using aircraft to move around metropolitan areas is not new. For decades, helicopters have been used as a premium means for urban travel, with varying degrees of success. Recently, both United

Airlines and Delta Air Lines have attempted some sort of program to ferry passengers willing to pay the extra cost from a helipad in New York City to one of the metropolitan airports.⁴ Uber Elevate, a leader in UAM, has recently unveiled a similar program in New York City as the first step toward its future UAM product, Uber Air, whereby individuals can take an Uber from their home to a nearby heliport, hop on a short helicopter flight to JFK, and then grab another Uber trip to their terminal.⁵

Still, it is the technology that makes UAM exciting and may lead to its success where more traditional methods of air transportation have failed. The Boeing Company has estimated that self-piloted electric VTOL configurations could reduce total operating costs per seat mile by 26 percent compared to piston-engine helicopters used today. These savings come from a combination of a) a reduction in fuel and maintenance costs associated with electric propulsion, b) no costs for onboard piloting or equipment to support an onboard pilot, and c) cost reductions enabled from advanced manufacturing processes.⁶

Moreover, eVTOL aircraft will use zero-emission vehicles that operate quietly, unlike traditional helicopters, which have been plagued by concerns about noise and air pollution.

The success of UAM will depend in large part on scalability. For example, Uber’s initial plans call for “mid double-digit thousands’ of flights per city per day”⁷ and anticipate each vehicle operating at over 2,080 hours per year, as opposed to 300 hours per year for the average commercial helicopter. Uber believes that this scale eventually will help to reduce costs to below those associated with purchasing a car.⁸

Potential Barriers to Success: Local Issues Likely Will Predominate

The bottom line is that, while the technology and business aspects of UAM will be novel and at a scale never before attempted, the federal regulatory model for such operations already exists and can serve as a useful and productive starting point. For example, while there are certain issues related to the certification of eVTOL aircraft, such certification can be accomplished—and is currently being pursued by several companies—within the existing framework with necessary waivers, exemptions, and deviations. While fully or highly autonomous

Jeffrey J. Immel (jimmel@jenner.com) is an associate in the Aviation and Aerospace Practice Group at Jenner and Block in Washington, D.C. He helps guide businesses through the evolving unmanned aircraft systems (UAS) regulatory landscape and other matters involving traditional aviation. Prior to practicing law, Immel was a lieutenant commander and pilot in the U.S. Navy. **Jonathan Alexander (Alex) Langlinais** (jalanglinais@jenner.com) is an associate in the Communications, Internet and Technology Practice Group at Jenner and Block in Washington, D.C. His practice focuses on emerging technologies, including autonomous vehicles.

vehicles (AVs) will present significant challenges, many UAM companies are planning on beginning operations with piloted aircraft while certification of unmanned aircraft is worked out. Similarly, while the sheer number of aircraft flooding already dense urban airspace will present a challenge to air traffic control, the framework for authorizing such flights already exists, including the establishment of visual flight rules (VFR) corridors, pre-approved routing requiring limited interaction with controllers, and equipment requirements. Such mitigation strategies have been used for years with helicopters, including for aerial tours, and would be available for adaptation to UAM concepts and technological advances, such as dynamically opening, closing, or moving VFR corridors based on demand.⁹

Ultimately, although the federal regulatory landscape will likely need to evolve to meet certain of UAM's unique requirements—think pilot minimum-qualification standards, given the sheer volume of necessary aircrew and highly automated aircraft—it should not prove to be a true barrier for UAM. Instead, the likely pacing factor will be local and state regulations and concerns, as illustrated by the following examples.

Zoning and Construction

Typical UAM concepts have the eVTOL aircraft picking up passengers at a “vertiport” and dropping them off at either an airport or another vertiport. The concepts for vertiports vary from a simple concrete pad to an actual air terminal, but the basic idea is a variation on a traditional heliport. Federal Aviation Administration (FAA) guidance on heliport construction and operation would serve as a useful starting point for vertiport construction and could likely accommodate almost any vertiport design.¹⁰ However, local concerns such as zoning ordinances and construction permits will likely present a much more formidable challenge to UAM operators. Just as importantly, perceived safety, noise, and congestion concerns and not-in-my-backyard campaigns are certainly to be expected, no matter where the vertiport would be located. In fact, local concerns led to the effective banning of rooftop heliports in New York City following a 1976 helicopter crash.

Nuisance and Trespass

Nuisance and trespass laws can also be expected to cause issues for UAM operators. *Aerial trespass*, as currently defined in the *Restatement (Second) of Torts*, is “[f]light by an aircraft in the air space above the land of another . . . if, but only if, (1) it enters into the immediate reaches of the air space next to the land, and (2) it interferes substantially with the other’s use and enjoyment of the land.”¹¹ The term *immediate reaches* was first used by the Supreme Court in 1946 in *United States v. Causby*, a case that held that the repeated approach of military heavy bombers at a height of

83 feet over an individual’s house could constitute an unconstitutional taking under the Fifth Amendment.¹² However, the Court declined to define precisely what the limits of the immediate reaches were, holding only that “[f]lights over private land are not a taking, unless they are so low and so frequent as to be a direct and immediate interference with the enjoyment and use of the land.”¹³ While it is unclear whether the reasoning of *Causby* would extend beyond the Fifth Amendment to state tort laws, repeated flights on the order of thousands per *day* may nonetheless give rise to a claim that the operations are “substantially” interfering with the landowner’s enjoyment of his property. The number of flights may also give rise to a traditional nuisance claim.

Additionally, consideration is being given to redrafting tort and nuisance laws to specifically address whether novel aircraft and uses such as package delivery by drones and UAM even fit within the existing legal landscape. Frameworks suggested recently include those that redefine *aerial trespass* to remove the interference requirement and to more closely align with the no-harm standard of trespass on land or those that impose a “bright line” in the sky below which operations would constitute per se trespass and nuisance.¹⁴ However, none of these have been implemented without at least significant exemptions that would permit FAA- and Department of Transportation–approved operations.

Regulation at Airports

One area in which local and federal regulatory authorities and interests will come into conflict is the regulation of UAM, UAM-related operations, and multimodal transportation at airports. In fact, airports are now an active hub for the testing and development of AV technologies. Today, airports around the world are exploring ways to integrate autonomous technology into their operations. Several international airports have explored using AVs to shuttle employees and cargo across runways and incorporating AVs into their surface transportation options.¹⁵ Beyond the transportation space, other airports have experimented with the use of drones to improve airfield inspections and bird control.¹⁶ In short, the world’s airports are likely to be a locus of innovation and experimentation in the development of AV technologies, including UAM.

Airport authorities and local governments with jurisdiction over airports are also likely to be major players in the regulation of UAM, at least in the near term. This is unsurprising. For now, despite the plans for vertiports—and perhaps because of the local issues with developing them—airports are one of the few places in metropolitan areas that currently have both the space and infrastructure needed to support a significant number of passenger and cargo aircraft. They are also a natural destination and point of departure for UAM customers, including business customers shipping cargo to and from airports and individuals

looking to avoid congested highways on their way to and from their flights.

Although the FAA has jurisdiction over the safety and flight of aircraft, local airport authorities typically have broad powers over the operation and management of airport facilities, subject to federal grant assurances and other FAA regulations and rules.¹⁷ Airport authorities also generally have the power to set rules and collect fees on certain commercial operations at airports, including for services such as taxis and ridesharing. Like any other mobility companies serving customers at airports, companies involved with UAM services will likely fall within the jurisdiction of airport authorities for at least some of their operations. So the regulations and fees adopted by airport authorities, as well as applicable state or local taxes, will be important factors for these companies to consider as they develop their UAM lines of business and make decisions about where to deploy aircraft.

As autonomous transportation options grow and become more commonplace in metropolitan areas, airport authorities will likely retain some significant autonomy of their own to regulate UAM. The way that states have chosen to treat the relationship between AVs and airports is instructive. Many states have adopted legislation that expressly preempts local regulation and taxation of AVs. However, some of these states have expressly carved out airport authorities from this general rule. For instance, Nevada's AV statute makes clear that its preemption of local regulation does not prohibit an airport or airport authority from imposing permit requirements, charging fees, or complying with "any other requirement to operate at the airport."¹⁸ Likewise, Florida's statute broadly preempts local regulation and taxation of AVs. But it allows airports to charge "reasonable fees consistent with any fees charged to companies that provide similar services at that airport" and to set rules for staging, pickup, and similar operations.¹⁹

Other states that preempt local regulation of AVs might still allow airport authorities to regulate AVs insofar as they are picking up and dropping off passengers as part of a ridesharing or "transportation network company" (TNC) business. TNC is generally defined as a company that allows passengers to prearrange rides with drivers using a digital network.²⁰ States often give airport authorities express powers to regulate TNC operations at airports. For example, the Texas Transportation Code provides that no political subdivision may "impose a franchise or other regulation" related to the operation of AVs,²¹ and the Texas Occupations Code also broadly preempts local regulation and taxation of TNCs.²² Yet the Occupations Code also provides that airports "may impose regulations, including a reasonable fee, on a transportation network company that provides digitally prearranged rides to or from the airport."²³ This could in theory be

taken as authority to regulate AVs to the extent that they are operating as part of a TNC.

Airport authorities in several states retain at least some power to regulate AVs and impose fees on their operations, and we expect that airport authorities will have similar powers in the future to regulate the operations of UAM as these modes of transportation continue to grow. That should be somewhat unsurprising as a policy matter, given the special logistical challenges associated with having autonomous aircraft taking off and landing in active airspaces at and around airports. Indeed, bringing UAM to airports will add a fair bit of complexity to the airport ecosystem—and arguably more so than the introduction of autonomous surface vehicles, which promise to one day merge into the existing stream of human-driven cars and buses traveling into and out of airport pickup and drop-off lanes. For these reasons, we do not expect airports and airport authorities to have any less authority to regulate UAM than they currently have to regulate AVs. Companies developing their own UAM lines of business will therefore want to take an active role in monitoring the development of rules and regulations governing airport facilities.

Conclusion

Ultimately, UAM has captured the aviation industry's imagination and generated enormous interest because of the novel technologies and the potential to redefine urban travel. However, from a regulatory perspective, air travel in metropolitan areas is not necessarily novel, and legal and regulatory frameworks exist to address most, if not all, of the perceived hurdles to gaining regulatory approval to operate from an aviation perspective. It is much more likely that the difficulty in implementation will lie not with technological development or federal aviation regulatory bodies but with state and local authorities and policies. Solving state and local issues will be the major challenge to opening the skies to UAM.

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Renewed Ambitions in Space-Exploration Lawmaking

By Christopher D. Johnson

On May 30, 2020, Space Exploration Technologies Corporation (SpaceX) wowed spectators, confounded detractors, and thrilled anxious fans with the first successful commercially built and operated launch of the American astronauts to the International Space Station (ISS) orbiting at around 17,500 miles per hour at approximately 248 miles above the Earth. Departing from Launch Pad 39A at the Kennedy Space Center in Florida—the same launchpad used by the Apollo and Space Shuttle programs—astronauts Bob Behnken and Doug Hurley become the first American astronauts launched on American rockets from American soil in almost 10 years. This mission ends the almost decade-long lack of domestic human-launch capability that followed the retirement of the Space Transportation System (Space Shuttle) in 2011. With this new mission, the commercial provisioning and service of human orbital spaceflight has now begun. As with many new commercial activities and technological advances, new laws and regulations follow.

Recent ambitious regulatory initiatives at the national and international level demonstrate that, at long last, American lawmaking specifically focused on space exploration and utilization is accelerating. A few recent notable initiatives in national legislation directed at space exploration and development are detailed below.

White House Executive Order on Space Resources

On April 6, 2020, the White House issued Executive Order No. 13914, recontextualizing American commercial space activity within government-led exploration programs and firmly placing the use of space resources within America's economic sphere.¹ This Order, *Encouraging International Support for the Recovery and Use of Space Resources*, takes a bold position on the access, recovery, possession, use, and right to sell space resources, as well as on how the United States will undertake international engagement on these issues. It proclaims that “Americans should have the right to engage in commercial exploration, recovery, and use of resources in outer space, consistent with applicable law.”

This order will have national and international implications. First, the order reaffirms the importance that the U.S. government places on commercial partners for government-led space activities, including crewed space exploration programs. This reaffirmation

makes reference to the Trump Administration Space Policy Directive 1 of 2017, which set multiple national space-exploration goals and established the priority of fully leveraging the domestic commercial space sector to accomplish these aims.²

However, the main import of the Order is to direct and advance the discussion on space resources. To do this, the Order comments forcefully on the international context surrounding space resources by first stating that international legal uncertainty exists concerning the right to recover and use space resources, including the commercial right to recover and use space resources—in part because of uncertainty surrounding the 1979 Moon Agreement.³

Additionally, while the United States is not a party to the Moon Agreement, it *is* a party to the 1967 Outer Space Treaty,⁴ and the Order takes the position that differences between those two treaties' regulation of space resource use create significant uncertainty for any advanced space missions or for any long-term human presence on celestial bodies.

The Order explicitly rejects the Moon Agreement as reflecting customary international law; it rejects the wider ratification of the Moon Agreement as a desirable way to address legal uncertainty regarding space resources; and it rejects the Moon Agreement as a source for any substantive guidance for any potential way forward. This strong denunciation is a wise move, as the Moon Agreement (in this author's opinion) is truly a poor path forward for current or future space activities. Written long before space-resources utilization was even technologically possible, the Moon Agreement contains untested concepts such as the Common Heritage of Mankind principle applied to the space domain. It also contains articles with overlapping and contradictory clauses that make it unclear what a subject of the law can legally do with space resources. And while a few State delegations at COPUOS (the United Nations Committee on the Peaceful Uses of Outer Space) continually bring up

Christopher D. Johnson (cjohnson@sufound.org) is the space law adviser at Secure World Foundation, a private nongovernmental organization focused on space sustainability. He is an adjunct professor of law at Georgetown University Law Center, where he co-teaches the Space Law Seminar, and a faculty member at the International Space University, headquartered in Strasbourg, France. Johnson is admitted to practice law in the District of Columbia, New York State, England, and Wales.

the Moon Agreement at each session, the U.S. position is firm and has remained consistent. The Order states:

Sec. 2. *The Moon Agreement.* The United States is not a party to the Moon Agreement. Further, the United States does not consider the Moon Agreement to be an effective or necessary instrument to guide nation states regarding the promotion of commercial participation in the long-term exploration, scientific discovery, and use of the Moon, Mars, or other celestial bodies. Accordingly, the Secretary of State shall object to any attempt by any other state or international organization to treat the Moon Agreement as reflecting or otherwise expressing customary international law.

Besides this comprehensive dismissal of the Moon Agreement, the Order also rejects the contention that outer space, including the Earth's Moon and other celestial bodies (e.g. Mars, asteroids) or "void" space itself, is somehow legally a global commons. The phrase "global commons" is more of an economics concept than a term with legal consequence and is rather difficult to apply to outer space. No source of international law positively designates any portion of outer space, or the entirety of outer space itself, as a global commons. Additionally, outer space is not on our globe (it's . . . in outer space) so logically, how could it be a "global" commons when it's not on the globe? Other domains that are sometimes referred to as "global commons" include the high seas, the deep seabed, and international airspace. In contrast, Antarctica is referred to as an "international commons," as only some particular States share rights and responsibilities there. The Order's pronouncement that outer space is not a global commons will spark mostly academic refutation, but it serves to show how strongly this administration feels about acting to prevent possible obstacles to national and commercial recovery and use of space resources.

The Executive Order will also have domestic implications. First, it is rare, and thus precedential, for a White House to use an Executive Order to address civil space activities and space exploration.⁵ The Order is also consistent with and expands on previous legislative action, namely the Space Resource Exploration and Utilization Act of 2015, which is the landmark U.S. law on space resource utilization.⁶ The 2015 law created definitions of space resources and established the right for private American entities to access and possess such space resources. The first of its kind anywhere in the world, this national space legislation governing private commercial space resources has influenced similar national lawmaking internationally. Now the Executive Order further solidifies and develops the rights of private commercial space resource access and use. It will be received warmly by private commercial space exploration advocates and actors and their financial backers.

The Order also directs the Secretary of State, in the course of its international engagement (and in consultation with the Departments of Commerce and Transportation, NASA, and other federal agencies) to "take all appropriate actions to encourage international support for the public and private recovery and use of resources in outer space . . ." These actions will include the negotiation of bilateral and multilateral agreements with other States around the globe regarding the safe and sustainable recovery and use of space resources.⁷ Following the release of the Order, such international engagement efforts did not take long, as we have now seen with the announcement about the Artemis Accords, a NASA-led international space exploration framework.

The Artemis Accords

For those not keeping track, the last time anyone set foot on the surface of the Moon was December 13, 1972, when NASA Astronaut Gene Cernan (1934–2017) climbed aboard the Apollo 17 Lunar Module to return to Earth after three days of lunar exploration. After almost 50 years, the United States has resolved that it is time to go back. To that end, NASA created the Artemis program, its mission being to bring the first woman and the next man to the surface of the Moon by 2024,⁸ and its name derived from the ancient Greek goddess Artemis, the twin sister of Apollo.

The Artemis program will be implemented and led by NASA with significant international and commercial partnerships. Traditional space agency partners may include the European Space Agency (ESA), the Russian Space Agency (Roscosmos), the Japanese Space Agency (JAXA), the Canadian Space Agency (CSA), and others. Emerging space powers such as Australia, New Zealand, Luxembourg, or the United Arab Emirates may also join in. However, as of this writing, no firm details on partnerships between NASA and other space agencies have been announced. Artemis will also fully leverage U.S. commercial space industry capacity, and companies such as SpaceX and a host of others are expected to participate. Currently, the plan envisions 37 launches and a Moon base beginning in 2028.⁹

Structuring and executing the Artemis program will require international legal agreements between NASA and its foreign governmental and space agency partners. Artemis's immediate human-spaceflight predecessor, the International Space Station (ISS), was legally structured as a multilateral treaty with subsidiary bilateral arrangements between the United States and partner nations.¹⁰ Artemis will take a different approach. On May 15, 2020, NASA Administrator James F. Bridenstine gave a presentation on the Artemis Accords, a set of legal and policy principles for agreements with other countries about using and operating in space and fulfilling the Artemis mission.¹¹

The basic elements of the Artemis Accords appear to be a reiteration of basic principles of the Outer Space

Treaty with some additional progressions and innovations.¹² The restatements of basic principles include the exhortation that the Moon be used exclusively for peaceful purposes, as well as obligations concerning transparency about national space activities, release of scientific data to the international community, the international registration of space objects, the emergency assistance of astronauts, and an understanding that the use of space resources is permissible under existing international space law. These basic elements of space law are found in the first 11 articles of the Outer Space Treaty, as well as the 1968 Astronaut Rescue and Return Agreement. In turn, the elements of the Artemis Accords that offer a progressive development of international space law include a requirement that national Artemis partners implement interoperability between actors, the protection of lunar heritage sites, the deconfliction of lunar activity, and obligations for the removal of spacecraft and orbital debris.

The protection of lunar heritage sites (including American, Soviet, Indian, and Israeli spacecraft) on the Moon is necessary to preserve and protect those locations as historically significant, precious artifacts of human space exploration. There is even an organization, For All Moonkind, promulgating the legal protection of these heritage sites.¹³ In 2011, NASA developed guidelines on lunar heritage sites.¹⁴

However, perhaps the most interesting and undeveloped element of the Artemis Accords has to do with deconfliction of lunar activities among Artemis partners. On the topic of deconfliction, NASA states that

[a]voiding harmful interference is an important principle of the Outer Space Treaty which is implemented by the Artemis Accords.

Specifically, via the Artemis Accords, NASA and partner nations will provide public information regarding the location and general nature of operations which will inform the scale and scope of “Safety Zones.”

Notification and coordination between partner nations to respect such safety zones will prevent harmful interference, implementing Article IX of the Outer Space Treaty and reinforcing the principle of due regard.¹⁵

Consequently, while national appropriation of space and subparts thereof is impossible under Article II of the Outer Space Treaty, States retain jurisdiction and control over their registered space objects under Article VIII, and therefore the concept of “safety zones” appears necessary under Artemis. In reality, given the physical circumstances of the Moon, safety zones make sense. On average, the horizon of the Moon is only around 1.5 miles from any given location (omitting hills, valleys, and craters). Additionally, any takeoffs and landings from the Moon will certainly create plumes of lunar dust—some

of which might not only encircle the entire Moon but may even leave the Moon permanently. As lunar dust can be harder, sharper, and smaller than grains of broken glass, dust plumes are a real threat to operations.¹⁶ Additionally, radio-frequency interference is another potential threat for surface operations. Consequently, the establishment, maintenance, and observance of safety zones will be necessary for Artemis and other lunar activities.

Conclusion

These two initiatives, the White House Executive Order and the Artemis Accords, demonstrate an energetic and proactive stance taken by the United States (whether from the White House, NASA, or Capitol Hill, or on an interagency basis) to address current and emerging space activities head on by regulating carefully but robustly what needs to be regulated and creating an enabling environment for anticipated governmental, public-private, and wholly private space activities.

Lastly, it should be noted that these are not the only recent regulatory initiatives affecting users of space that interested readers may wish to learn about. Other recent national regulatory endeavors have addressed activities closer to Earth, with new rules focused on space debris. These include the updated *Orbital Debris Mitigation Standard Practices* (ODMSP), which now encompass different orbital regimes and different categories of small spacecraft.¹⁷ The updated ODMSP might be contrasted with the perhaps more ambitious *Report and Order and Notice of Further Rulemaking on Orbital Debris* from the Federal Communications Commission (FCC).¹⁸ Both of those documents, released in 2019, are aimed at addressing the persistent and growing problem of space debris, especially in light of the growing field of new users to the space domain, including numerous small satellite operators, and so-called “megaconstellations” of large numbers of spacecraft in orbital shells around the Earth. Whether focused closer to Earth or further out, budding space lawyers have plenty to consider.

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14. *See, e.g.,* A.B.A. House of Delegates Resolution 111 (Feb. 17, 2020) (urging federal, state, local, territorial, and tribal governments, and their respective agencies and departments, to protect real property interests, including common law trespass and privacy rights, with respect to any statute, ordinance, regulation, administrative rule, order, or guidance pertaining to the development and usage of unmanned aircraft systems over private property).

15. Angela Gittens, *How Airports Can Prepare for the Rise of Autonomous Vehicles*, INT’L AIRPORT REV. (Nov. 27, 2019), <https://www.internationalairportreview.com/article/107722/automation-av-aci-world-aviation>.

16. Frances Marcellin, *Good Drones: The UAVs Changing Airport Operations for the Better*, AIRPORT TECH. (Feb. 27, 2020), <https://www.airport-technology.com/features/positive-uses-of-drones-in-aviation>.

17. *See, e.g.,* CAL. PUB. UTIL. CODE § 22555 (providing that airport district boards shall “make all rules governing the use of airports and spaceports, landing places for

aerial traffic, and other aerial facilities of the district that the board determines to be necessary”); TEX. TRANSP. CODE ANN. § 22.014(a) (counties and municipalities “may adopt ordinances, resolutions, rules, and orders necessary to manage, govern, and use an airport or air navigation facility under its control or an airport hazard area relating to the airport”).

18. NEV. REV. STAT. ANN. § 706B.290(2)(b).
19. FLA. STAT. ANN. § 316.85.
20. *See, e.g.*, TEX. OCC. CODE ANN. § 2402.001(5).
21. TEX. TRANSP. CODE ANN. § 545.452.
22. TEX. OCC. CODE ANN. § 2402.003.
23. *Id.* § 2402.003(b).



COMMITTEE SPOTLIGHT

Drone Law Committee

By Dean E. Griffith and Kelli A. Hooke



Keeping up with developments in the drone industry can be daunting. The FAA is poised to issue its first major drone rule since 2016; drone technology is advancing; testing is being performed by Integration Pilot Program participants, Unmanned Aircraft Systems (UAS) Test Sites, the UAS Center of Excellence, and the industry itself; and the debate around whether authority to regulate drone operations should be shared with state and local governments rages on.

The Drone Law Committee provides lawyers in industry, government, and the private sector a forum in which to discuss and stay current on the latest issues affecting the industry. The Drone Law Committee membership is unique: members not only work in a variety of practice settings but they also come from different backgrounds beyond aviation. In addition to aviation, the Committee roster includes lawyers practicing in such areas as telecommunications, government contracting, cybersecurity, and energy. This diverse membership is rooted in the fact that drones, at their core, are flying computers that can be used for a variety of tasks.

Our goal as co-chairs is to offer timely and informative programming helpful to Committee members' practices and to provide opportunities to interact with other members and expand their networks. The

Committee's programming includes bimonthly calls and an in-person annual conference. The bimonthly calls provide members a convenient way to hear from industry leaders on topics of the day. Recent calls featured ways in which drones have been used to respond to the COVID-19 pandemic, research being done by UAS Integration Pilot Program participants, and the FAA's UAS Remote Identification Notice of Proposed Rulemaking.

In September, the Committee will be holding a series of webinars featuring thought leaders addressing questions regarding the public attitude and acceptance of drones, regulatory developments, spectrum considerations, public contracting issues, and use and deployment of counter unmanned aircraft systems. These webinars will be held in lieu of our annual conference this year, traditionally held in June in Washington, D.C.

In addition to our formal programming, we also encourage our members to use ABA Connect to post questions, articles, or anything drone-related that they find interesting.

The Committee also offers an opportunity for leadership. Any and all ideas for programming are welcome, as is participation in Committee governance.

We look forward to you joining the Drone Law Committee!

For more information, visit our website at https://www.americanbar.org/groups/air_space/divisions/drone_law/ or contact us at the email addresses listed below.

Dean E. Griffith (dgriffith@jonesday.com), of counsel at Jones Day in Washington, D.C., worked for the FAA for close to a decade, in part as a UAS regulatory policy team lead for the FAA's Office of the Chief Counsel. He counsels clients on regulatory matters pertaining to the FAA and UAS. **Kelli A. Hooke** (kellibooke@gmail.com) is a senior corporate counsel for T-Mobile, advising on legal and compliance issues. Before accepting her current position, she worked for two decades for the U.S. Army; her role there included advising on strategic operations in space. Griffith and Hooke are co-chairs of the Drone Law Committee.

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recognizes the new requirements many state bar associations now place on legal education, and my hope is that we continue these sessions in years to come.

The conference will be 100-percent virtual, and we will be using state-of-the-art technology to deliver an engaging, interactive experience for all of our members. We recognize that the pandemic has had a disproportionate economic impact on the aviation sector and our members, and with deep appreciation for our long-time sponsors and members, we are pleased that the Annual Conference and Meeting will be free to all members of the Forum. I encourage each of you to reach out to one person whose voice might not normally be heard and invite and encourage him or her to participate in the Forum and speak up during the virtual panels. This is one small way each of you can promote diversity and inclusion.

In addition to the Annual Meeting, each of our eight committees—Space, Drones, Airports, General Aviation, Finance, Consumer Protection, Cargo, and Sustainability—will be holding free-to-members meetings during the month of September. If you have not signed up for a committee yet, please visit <https://connect.americanbar.org/home> to find committees that will offer you opportunities to get involved and interact with other members who share your interests.

As always, please reach out to me at jennifer.trock@bakermckenzie.com or 202-452-7055 if you have questions, want to get involved, or just want to connect. I’d love to hear from you.

Jennifer Trock

Chair, Forum on Air and Space Law