

# LEGAL MEMORANDUM

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## Cooperative Federalism and Low-Altitude Drone Operations

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### Abstract

*Bipartisan measures have been introduced in the House and Senate proposing a cooperative-federalism approach to the regulation of Unmanned Aircraft Systems. Specifically, below 200 feet in altitude, state, local, and tribal authorities could reasonably regulate the time, manner, and place of drone operation. This authority would permit local governance of low-altitude drone activity in a manner similar to traffic management. President Donald Trump has also signed a presidential memorandum establishing pilot programs for commercial drone operations that would require the participation of state and local authorities. Congress should reject overblown concerns about a regulatory “patchwork” and adopt a cooperative-federalism approach that leverages the unique competencies of state, local, and federal officials to foster a competitive, safe, and innovative drone industry.*

### Introduction

Congress is currently debating whether state, local, and tribal governments should have any say in the regulation and governance of recreational and commercial drone activity taking place in and just above their communities. A bipartisan measure, the Drone Federalism Act (DFA),<sup>1</sup> proposes a cooperative-federalism approach to the regulation of Unmanned Aircraft Systems (UAS).<sup>2</sup> Below 200 feet in altitude, “the authority of a State, local, or tribal government to issue reasonable restrictions on the time, manner, and place of operation of a civil unmanned aircraft system” would not be automatically preempted by federal law.<sup>3</sup> Above this altitude,<sup>4</sup> drones would remain under the control of federal regulators, much as manned aviation is today.

### KEY POINTS

- Drones present a novel impetus for cooperative federalism in low-altitude airspace.
- In *United States v. Causby*, the U.S. Supreme Court recognized that a “landowner owns at least as much of the space above the ground as he can occupy or use in connection with the land,” and states retain a sovereign interest in executing their police powers in this low-altitude airspace.
- Drones will operate extensively in this low-altitude airspace where state and local interests like trespass, nuisance, property damage, personal injury and land use predominate.
- Congress should specify that states and localities may adopt and enforce local regulations on drone conduct that takes place in airspace below a clearly defined threshold.
- Federal regulators should retain regulatory control over clear federal interests, such as aviation safety, manufacturing and performance standards, and drone activity within the navigable airspace, as well as authority to preempt local restrictions as needed to serve these goals.

This paper, in its entirety, can be found at <http://report.heritage.org/lm222>

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President Donald Trump has also taken action, signing a presidential memorandum ordering the Department of Transportation to establish pilot programs to “promote the safe operation of unmanned aircraft systems” and “continued technological innovation” in this field.<sup>5</sup> The three-year program aims to test new types of drone operations and study various methods of regulating these operations, with the goal of developing a “sufficiently flexible” regulatory framework that features close “involvement of State, local, and tribal governments.”<sup>6</sup> As the President has noted, “Input from State, local, tribal, and private-sector stakeholders will be necessary to craft an optimal strategy for national management of UAS operations.” Secretary of Transportation Elaine L. Chao recently wrote that the “pilot program will help ensure that Americans reap the benefits of safe drone technology.”<sup>7</sup>

Critics of such a framework argue that anything short of total federal preemption will result in a “patchwork” of regulation that will inhibit development of the drone industry and risk the safety of the nation’s airspace. These arguments are wide of the mark. The federalism framework proposed in the DFA and the President’s memorandum recognizes that drones present unique benefits as well as diverse challenges and risks that run the gamut from local concerns such as where, when, and how drones should be permitted to operate in airspace below 200 feet to the inherently federal interest in promoting manned aviation safety.

Consequently, the existing aviation regulatory framework, which places virtually all authority exclusively in the hands of federal regulators, is not well-suited to drones. Only a cooperative-federalism approach that leverages the unique competencies of state, local, and federal officials will allow for the development of a competitive, safe, and innovative drone industry.<sup>8</sup>

### **The Aviation Regulatory Framework**

Aviation regulation in the United States has long been a primarily federal affair, and for good reason. The market for air travel is without question principally interstate.<sup>9</sup> Even aircraft that operate exclusively intrastate often fly in the same airspace as long-haul craft bound for distant locales. Operating aircraft in the same airspace under different sets of rules would risk chaos and create significant threats not only to the aircraft themselves, but also

to people on the ground. It is therefore natural that a single set of regulations should be developed to ensure that the navigable airspace is used as safely and efficiently as possible.

In the United States, the authority for promulgating these regulations is vested in the Federal Aviation Administration (FAA).<sup>10</sup> Its authority over aviation is sweeping. The FAA and its predecessor regulatory bodies have imposed all manner of aviation regulations, including pilot training and certification; aircraft design standards and mandatory design review (such as the requirement that manufacturers obtain a type certificate, which certifies that an aircraft design is airworthy); safety standards and requirements; the establishment of flight paths and safe altitudes of flight; and other operational rules<sup>11</sup> governing everything from aircraft noise to the flow of air traffic.<sup>12</sup> Taken together, these regulations have preempted virtually the entire field of aviation law and regulation.<sup>13</sup>

This federal regulatory scheme goes back to the 1926 Air Commerce Act, passed to facilitate the rise of manned aviation in the United States.<sup>14</sup> The act vested sovereignty over the national airspace solely with the “United States Government.”<sup>15</sup> The law established the “navigable” airspace—that portion of the air above the “minimum safe altitudes of flight”<sup>16</sup>—and set it aside as a “public highway” reserved primarily for aviation.<sup>17</sup>

This decision was driven by practical necessity. The prevailing maxim of airspace property rights at the time, known as the *ad coelum* doctrine, held that landowners possessed everything above and below their property without limit.<sup>18</sup> Under this theory of ownership, an aircraft flying at 10,000 feet could be held liable for a trespass each time it crossed a boundary line from one plot of private land to another. The burden of obtaining easements increased as the range of aircraft grew; a single long-haul or transcontinental flight might require thousands of individual agreements with landowners, any one of whom could refuse to grant overflight rights. Under these conditions, aviation development almost certainly would have ground to a halt. Creating the concept of the “navigable airspace” as a federally regulated commons solved the problem by rolling back—but not eliminating—private airspace property rights.

The Supreme Court of the United States endorsed this act in an aviation-related takings case out of

North Carolina. In *United States v. Causby*, the Court held that the old *ad coelum* “doctrine has no place in the modern world.”<sup>19</sup>

In the same opinion, however, the Court also concluded that this new “aerial highway” did not extend into “the immediate reaches above the land.”<sup>20</sup> The Court provided only an ad hoc methodology for identifying the extent of these “immediate reaches,” but its ruling was clear that at least *some* private property interest remained in the airspace near the ground, regardless of federal aviation law.<sup>21</sup> The Court wrote that “the meaning of ‘property’...will normally obtain its content by reference to local law.” Citing a North Carolina statute, the Court continued:

Sovereignty in the airspace rests in the State “except where granted to and assumed by the United States.” The flight of aircraft is lawful “unless at such a low altitude as to interfere with the then existing use to which the land or water, or the space over the land or water, is put by the owner”.... Subject to that right of flight, “ownership of the space above the lands and waters of this State is declared to be vested in the several owners of the surface beneath.”<sup>22</sup>

Thus, the Court could comfortably conclude, based on principles of federalism and common sense, that a “landowner owns at least as much of the space above the ground as he can occupy or use in connection with the land.”<sup>23</sup> This “use,” incidentally, is not limited to physical construction or occupation; a landowner may “use” unoccupied space “in the same sense that space left between buildings for the purpose of light and air is used.”<sup>24</sup>

### Low-Altitude Drone Activity

It is in this low-altitude airspace, understood in *Causby* to be private property, that much of the drama related to UAS is currently unfolding. This fact is driven by three principal forces: regulatory limits on drones, technical limits on drones, and demand for particular services.

**Regulatory Limits on Drones.** Part 107 commercial drone regulations, which were put into effect in 2016 and which govern commercial drone operations in the United States, require drones to remain within 400 feet of the ground or within 400 feet of a structure.<sup>25</sup> These conditions are unusual in the aviation context, as FAA regulations, for obvious

safety reasons, typically require aircraft to avoid flying near the ground or physical structures.<sup>26</sup> Drones must be flown within visual line of sight of the operator, and a drone must have a physical operator in control at all times.<sup>27</sup> By design, FAA rules keep drones out of the navigable airspace, near the ground, and no more than several hundred feet from an operator.

Several drone manufacturers have rolled out geofencing technology that limits the maximum vertical altitude at which their drones may operate in accordance with airspace restrictions.<sup>28</sup> Similarly, the Academy of Model Aeronautics, the nation’s largest hobby flying organization, requires members to abide by a 400-foot ceiling when operating within five miles of an airport.<sup>29</sup> President Trump’s recent memorandum appears to be designed to pave the way for future federal regulations that will permit drones to operate beyond visual line of sight, operate autonomously or be controlled en masse, and engage in higher-altitude flight.

**Technical Limits on Drones.** The second condition that holds drones principally to low-altitude airspace is the inherent performance limitation of their design.<sup>30</sup> Drones are almost exclusively battery-powered, with flight times measured in mere minutes.

Most drones now on the market are rotor-driven quadcopters or octocopters that expend most of their energy generating lift. As a result, these devices are relatively slow. Were they to fly in a linear path, they would likely cover only a few miles before their batteries die. This range would be reduced still further if the drone were to be saddled with a payload like a package or a camera. While larger models, and especially fixed-wing drone models, have greater endurance, all are range-limited by the strength of the control signal generated by the remote used to operate them. It is reasonable to assume that future innovations will overcome these limits and produce drone designs with improved range and carrying capacity, but considerable improvements in battery technology will be needed before small UAS see significant range gains.

**Demand for Particular Services.** Most scenarios currently envisioned for the use of drones, whether civil, commercial, or recreational, involve drones flying in low-altitude airspace for most or all of their operations. On the recreational side, as noted, there is the 400-foot ceiling established by the Academy of Model Aeronautics. On the commercial side, current uses for drones—airial photography,<sup>31</sup>

property inspection,<sup>32</sup> agriculture,<sup>33</sup> and real estate development,<sup>34</sup> among others—largely, if not exclusively, involve flights near ground level.

The same holds true for future uses. Even assuming that regulatory and technical hurdles are overcome, drones used for individual package delivery,<sup>35</sup> aerial light shows,<sup>36</sup> or infrastructure inspection<sup>37</sup> will necessarily operate for significant periods of time at low altitudes, including in airspace immediately adjacent to private property or public land, such as a local park. Civil uses, such as supporting law enforcement operations<sup>38</sup> or search-and-rescue functions,<sup>39</sup> will take place principally in this envelope of atmosphere as well.

### What Will Drone Commerce Look Like?

These three factors, taken together, help to paint a picture of the near future of drone activity.

*First*, drones will likely conduct significant operations in low-altitude airspace. Under *Causby*, at least some of the airspace that will be crisscrossed by drones is private property. As long as the public demands drone services that entail flight at very low altitudes, this tendency toward low-altitude flight is likely to persist after the regulatory and technical hurdles holding drones to relatively low altitudes are overcome. In some cases, drones may fly at higher altitudes and drop into this near-Earth envelope of airspace when needed to complete a task, such as delivering a package. In other instances, drones may be used entirely in low-altitude airspace and never venture more than a few hundred feet above the ground.

*Second*, even as obstacles like communication limitations are overcome, existing battery technology will likely tie drones to a single area with a relatively tight radius. Drones are not likely to be used to ferry packages across tremendous distances—for example, from a warehouse on one side of a state to a recipient home on the other or in a different state altogether. Rather, the drone portion of this equation will represent the “last mile” of a vast logistical network and will operate out of a series of discrete “hubs” that receive packages and serve as home bases for drone fleets.<sup>40</sup> In such a case, delivery drones would fly no more than a few miles at a time and would seldom venture outside of tightly defined local areas.

Much, if not most, drone activity will take place very near the ground, though high-altitude operations will also take place, assuming that regulatory

restrictions on access to the navigable airspace are eventually lifted. Simply put, drones may become ubiquitous, operating in higher-altitude airspace currently reserved for manned aviation, all the way down to the blades of grass in individuals’ backyards: airspace that under *Causby*, is private property.

### Federal Preemption for Drones?

In 2007, the FAA published a policy notice in the *Federal Register* declaring for the first time that drones were to be considered “aircraft” for the purposes of federal law.<sup>41</sup> The consequences of this declaration were profound: According to the agency, “[a]s aircraft, these devices generally are subject to FAA oversight and enforcement.”<sup>42</sup>

FAA officials have since made public statements to the effect that drones have expanded the navigable airspace down to ground level.<sup>43</sup> In 2015, the agency released a fact sheet asserting that virtually the full field of state drone law and regulation was preempted by federal statute and regulation.<sup>44</sup> Under this legal interpretation, states and localities would have no independent authority to adopt operational restrictions on drone conduct taking place at any altitude.<sup>45</sup> Only the FAA could control drone conduct even when that conduct takes place one inch above private land and in no way involves a federal interest.

Broad federal preemption has proven to be both necessary and successful in the context of manned aviation.<sup>46</sup> Would equally broad federal preemption produce the same socially beneficial results in the context of unmanned aviation? The answer is “no.”

**Harms and Risks.** It is clear that the uses to which drones will be put are incredibly diverse. So are the potential harms and risks they engender. For example:

- A recreational operator learning to fly his new drone above his backyard risks damaging his neighbor’s property or harming the neighbor himself;
- A drone delivery hub will likely create a significant nuisance for nearby homeowners as drones buzz about;<sup>47</sup>
- A poorly charted course from a hub to a home could result in a drone invading private airspace and committing an aerial trespass;

- A photographer flying over crowds to capture a local holiday parade might inadvertently collide with a float; and
- A drone hobby club flying dozens of drones in a public park might deter residents from using the park for fear of their safety or simply because they do not like the noise.
- Setting nuisance and navigation ordinances to control for noise,<sup>54</sup> light,<sup>55</sup> waste,<sup>56</sup> and other environmental concerns;<sup>57</sup>
- Defining property rights<sup>58</sup> and overseeing land use,<sup>59</sup> and
- Establishing local traffic patterns, speed limits, and parking rules.<sup>60</sup>

In addition, criminals could use drones to smuggle illicit drugs or weapons into a prison, reckless or willfully dangerous operators might create hazards for manned aviation or fly their drones into restricted airspace above federal installations, and poorly constructed drones could fall from the sky, injuring people or property.

Drone activity, simply put, will involve wide-ranging sets of interests. Some fall squarely within the realm of FAA authority and expertise; others fall far outside of these areas.

**State and Local Regulatory Authority.** In our federal system, the U.S. government is one of limited enumerated powers. By ratifying the Constitution, the states sacrificed some of their innate sovereignty to form the Union, but they retained a broad police power that the federal government lacks.<sup>48</sup> Courts presume that federal regulations will not preempt a state from exercising its “police” powers unless that is the “clear and manifest purpose of Congress.”<sup>49</sup> This police power allows states and localities to impose various regulations in the name of protecting and advancing the public health, safety, and welfare.<sup>50</sup>

It is common knowledge that state and local rules address details of life on the ground. This is no quirk of the system; it is by design. The Framers of the Constitution believed strongly that most decisions that directly affect the people should be made at the level of government that is closest to them.

Regulations promulgated at the non-federal level address a wide variety of issues, including:

- Determining the location, time, and safety of pamphleteering, protest, and other public demonstrations;<sup>51</sup>
- Regulating commercial activity;<sup>52</sup>
- Preventing violence, crime, and obstruction of law enforcement officers and first responders;<sup>53</sup>

Many of these areas of expertise and authority are directly related to local drone commerce and recreation. It is doubtful that distant federal regulators will be sufficiently aware of the full and constantly changing picture of particular local conditions that may inhibit, interrupt, or otherwise affect drone activity.<sup>61</sup> Such knowledge will be necessary for the promulgation and maintenance of any highly particularized operational regulations that may be needed for wide-scale drone commercial activity.<sup>62</sup> The FAA knows that its staff is at a comparative disadvantage in responding to local concerns.<sup>63</sup> It is therefore unreasonable to assume that federal regulators will be more attuned to the needs and desires of local residents than are those residents’ own elected officials.

It is equally unlikely, however, that local jurisdictions can match the FAA’s expertise in aviation safety. Given the federal equities at issue and the truly novel nature of drone activity, some degree of federal oversight of this experimental process is clearly warranted. The optimal outcome would therefore be for the FAA to oversee the initial development of local drone rules and in the process help state and local jurisdictions develop the core competencies necessary to regulate the field. Such a process, as the presidential memorandum makes clear, will require a degree of experimentation.<sup>64</sup> This approach also has bipartisan support in Congress.<sup>65</sup>

**Management and Enforcement.** Before a federal court ruled that the FAA recreational drone owners’ registry was unlawful, the number of registered recreational drone owners was fast approaching one million and far exceeded the number of licensed pilots in the United States.<sup>66</sup> Meanwhile, The FAA issued some 22,959 remote pilot certifications in the first three months that Part 107 was in effect.<sup>67</sup> By some estimates, the number of drones currently active in the United States is already measured in the millions, and this number will only increase in the

coming years. By comparison, according to FAA figures, more than 15,000 air traffic controllers manage 50,000 flights per day, with approximately 5,000 commercial aircraft flying above the U.S. at any one time.<sup>68</sup> In terms of raw numbers, drones dwarf traditional aviation.

As drones proliferate, so will the enforcement challenges. Simply put, the agency does not have the manpower needed to address drone-related violations of federal aviation law in low-altitude airspace everywhere in the country. The FAA has a total staff of 50,000 employees.<sup>69</sup> By comparison, there are more than one million full-time state and local law enforcement agency employees, including 750,000 sworn officers with arrest power.<sup>70</sup>

As aviation innovation continues its rapid advancement—companies are on the verge of bringing supersonic transportation and “flying cars” to market—the already high demand placed on FAA personnel, facilities, and resources will only increase. Thus, the FAA can expect to confront additional challenges to the efficient management and use of the national airspace.<sup>71</sup>

The FAA recognizes that its “aviation safety inspectors, who are the agency’s principal field elements responsible for following up on...unauthorized and/or unsafe activities, will often be unable to immediately travel to the location of an incident” involving a drone.<sup>72</sup> With so few resources and so many complex, evolving issues to address, Congress should not let the FAA displace state and local government officials as the primary regulators of crime, tort, and property concerns simply because an incident happens to involve a small drone.<sup>73</sup>

### **Toward a Cooperative-Federalism Regulatory Framework**

The most common analogy drawn between drones and existing technology is the airplane. This is an attractive comparison because of the fundamental operational similarities between manned and unmanned platforms. Over time, these similarities will become more pronounced for those UAS that develop into high-altitude, long-range aircraft. At the same time, these similarities will likely diminish for systems developed to operate exclusively in low-altitude airspace and across short ranges.<sup>74</sup> UAS will need more than one regulatory framework to address the disparate externalities that they will engender.

It is therefore useful for the purposes of establishing a framework for this latter category of UAS that recognizes a need for state and local regulatory action to analogize drones to ground transportation. Automobiles do not operate within the confines of a single regulatory regime; overlapping rules and regulations are imposed at all levels of government. For example, automobiles are subject to federal manufacturing and safety standards, as well as federally imposed fuel economy standards; state-issued licenses are required to operate motor vehicles; and vehicles are driven in accordance with traffic laws that are set at the state and local levels. Enforcement of traffic laws is handled principally by state and local law enforcement officers.

Ground transportation thus provides an instructive model for the regulation of drones: a model that is instinctively understood by lawmakers and the population at large and that allows regulations to be imposed at various levels of government in accordance with the principles of federalism and the relative strengths, interests, and expertise of federal, state, and local regulators. Under such a framework:

- The federal government would be empowered to adopt regulations necessary to protect federal interests, such as the safety of manned aviation and the integrity of the navigable airspace, and federal assets, including government property and military installations;
- FAA regulations would govern the flight of drones operating within the navigable airspace or in any other controlled airspace;
- The FAA would be best positioned to set performance and safety standards, such as fail-safe requirements, and impose equipment mandates where needed; and
- The FAA could certify drone designs that are being manufactured for sale in U.S. markets.

Overall, federal officials have unparalleled aviation expertise, and this should be used to help develop, standardize, and harmonize drone rules adopted at the state and local levels.

The federal role in a cooperative-federalism approach to drone regulation is necessarily broad, but significant work remains to be done at the state

and local levels.<sup>75</sup> States and localities, for example, are best positioned to define airspace property rights, to define a cause of action for nuisance or trespass as applied to unmanned drones, and to impose reasonable operational restrictions on drone activity in low-altitude airspace in accordance with the demands and norms of individual communities. Such restrictions could take the form of speed limits, acceptable hours of operation, or limited bans near major local functions such as a parade or a high school football game. Existing land-use authority confers the ability to regulate takeoff and landing operations by drones within communities. States and localities could also prohibit drone interference with ongoing law enforcement activities.

It is important to note that this local and state-level authority would necessarily be restricted to the low-altitude airspace described in *Causby*. Given that the Court did not precisely define the extent of low-altitude airspace, it would be incumbent on Congress to define the altitude at which state and local authority would end. This altitude should be set high enough to permit a reasonable degree of regulation of local affairs while leaving a sufficient buffer between it and the navigable airspace. Both the Drone Federalism Act and the President's memorandum set this ceiling at 200 feet.<sup>76</sup>

### A “Patchwork” of Regulation?

A prevalent argument made in favor of broad, aviation-style preemption of the drone industry is the “patchwork” argument. The assertion is a simple one: If states and localities are permitted to impose any regulations whatever, or if property owners retain an interest in superadjacent airspace, the result will be an unworkable “patchwork quilt” of property boundaries and regulations that will hinder the development of the drone industry. This argument held sway a century ago when Congress first federalized aviation regulation. In the drone context, however, it is overblown.

Recall that small UAS are restricted to principally low-altitude, relatively short-range operations. Drone delivery services undoubtedly will be developed in the near future, but present plans for their use in this context involve frequent short-range trips between a local drone hub and homes or businesses within a tight local area. Other operations will involve even shorter flights. For example, a real

estate agent using a drone to photograph a new property on the market will not need to fly a drone more than a few hundred feet at any given time, possibly within the bounds of a single property. Thus, drones are likely to operate within the confines of a single jurisdiction or perhaps a small handful of jurisdictions at a time. It is no more unreasonable to expect operators to be aware of local rules governing drone conduct than it is in any other context.<sup>77</sup>

The information problem contemplated by advocates of the “patchwork” argument—that it will simply be impossible for operators to be aware of the rules in all of the jurisdictions in which they operate—also misses the mark. This problem is hardly unique to drones, and companies like FedEx and UPS have proven that they can maintain awareness of and abide by local traffic laws and regulations while managing thriving businesses.

In fact, dealing with this type of problem is easier than it has ever been. Consider mapping software such as Google Maps or Waze, which permit coast-to-coast travel through dozens or possibly hundreds of municipal jurisdictions. These apps provide turn-by-turn directions, advise drivers of the local speed limit and local incidents such as construction and accidents, analyze traffic patterns in real time and advise when faster alternate routes are available, and even inform drivers as to what lane they ought to use. This technology is helping to make possible fully autonomous vehicles, which will be able to operate on any road in the country without human intervention. All of this is possible without federalization of the nation's roads and traffic laws.

Similar technology already exists in the drone field. The FAA, for example, has released the B4UFLY mobile app to advise UAS operators of airspace restrictions in effect where they plan to operate.<sup>78</sup> Major companies, such as the Chinese drone manufacturer DJI, incorporate geofencing services that prevent operation in areas where drones are forbidden. Such technologies could be expanded to incorporate local drone regulations, permitting operators to make themselves aware of and adapt to changes in the regulatory environment easily and quickly.

Not every city and state will necessarily adopt pro-drone rules and regulations, but if operators find particular restrictions to be overly burdensome, they remain free to challenge them or take their business elsewhere. Thus, in addition to the

aforementioned benefits that accrue from a cooperative-federalism approach to drone regulation, consumers and entrepreneurs can count on one more: the creation of a competitive environment between cities and states. This will encourage experimentation as governments vie for drone commercial activity. Initially, some degree of variety will likely exist in local and state rules, but this is to be expected in a field as novel and immature as drone technology and should be embraced. Learned experience will separate unsuccessful regulatory regimes from successful ones, and as clear best practices emerge, laws and regulations will converge, much as they have with ground transportation.

This process of standardization should not be rushed, held to arbitrary timetables, or dictated in a centrally planned solution. It is true that there are significant benefits to uniform and predictable regulations, but any gains could be minimized if the resulting regulatory framework is not robust.

## Conclusion

The proliferation of drones in the airspace over the United States poses fresh regulatory challenges. Manned aviation and society as a whole benefited greatly from a federally preempted regulatory environment that removed legal, regulatory, and property-rights barriers to the development of that industry.

Simply applying this legal and regulatory scheme to drones, however, will not produce the same socially beneficial outcome. Small UAS are, and will continue to be, operated in a manner vastly different from traditional manned aircraft. Their harms and risks cut across a broad swath of interests from the federal to the local. No single regulatory body is equipped to address all of these issues effectively. Consequently, only a cooperative-federalism model that leverages the expertise of federal, state, and local governments can provide adequate governance of the drone industry.

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## Endnotes

1. The Drone Federalism Act, S.1272, 115th Cong. (2017), <https://www.congress.gov/bill/115th-congress/senate-bill/1272>.
2. A similar measure was introduced in the House of Representatives. See the Drone Innovation Act, H.R. 2930, 115th Cong. (2017), <https://www.congress.gov/bill/115th-congress/house-bill/2930>.
3. S.1272, *supra* note 1, at § 2(b)(1). Many states and localities already have enacted or considered laws on the definition and operation of drones. See NAT'L CONFERENCE OF STATE LEGISLATURES, CURRENT UNMANNED AIRCRAFT STATE LAW LANDSCAPE (July 25, 2017), <http://www.ncsl.org/research/transportation/current-unmanned-aircraft-state-law-landscape.aspx> (last visited Aug. 21, 2017); Arthur Holland Michel, *Local and State Drone Laws*, in CTR. FOR THE STUDY OF THE DRONE AT BARD COLLEGE, DRONES AT HOME (2017).
4. The Drone Federalism Act also extends local authority to set time, manner, and place restrictions to include airspace up to 200 feet around buildings and structures that are higher than 200 feet.
5. *Presidential Memorandum for the Secretary of Transportation* (Oct. 25, 2017), <https://www.whitehouse.gov/the-press-office/2017/10/25/presidential-memorandum-secretary-transportation>.
6. *Id.* Section 2 of the presidential memorandum establishes a pilot program objective to "test and evaluate various models of State, local, and tribal government involvement in the development and enforcement of Federal regulations for UAS operations."
7. Elaine L. Chao, *Reaping the Benefits of Safe Drone Technology*, THE HILL, Nov. 6, 2017, <http://thehill.com/blogs/congress-blog/technology/359027-reaping-the-benefits-of-safe-drone-technology>.
8. The term "drone" is commonly used to describe any device that falls within an incredibly broad category of unmanned flying machines. Consequently, discussion of drone-related policy is difficult because "drone" can mean a tiny quadcopter measuring one inch across as easily as it can mean an armed, high-flying military vehicle. For the purpose of this paper, "drone" refers to a device weighing less than 55 pounds that is incapable of carrying a human occupant and is generally designed for low-altitude, relatively low-speed flight. Larger drones capable of high-altitude, high-speed, and long-range flight are beyond the scope of this paper.
9. See U.S. CONST. art. 1, § 8, cl. 3; David F. Forte, *Commerce Among the States*, in THE HERITAGE GUIDE TO THE CONSTITUTION, <http://www.heritage.org/constitution/#!/articles/1/essays/38/commerce-among-the-states> (last visited Aug. 18, 2017).
10. "The Administrator of the Federal Aviation Administration shall develop plans and policy for the use of the navigable airspace and assign by regulation or order the use of the airspace necessary to ensure the safety of aircraft and the efficient use of the airspace." 49 U.S.C. § 40103(b)(1). 49 U.S.C. § 40103(b)(2) compels the FAA to "prescribe air traffic regulations on the flight of aircraft" for, among other purposes, "protecting individuals and property on the ground" and "preventing collision between aircraft, between aircraft and land or water vehicles, and between aircraft and airborne objects."
11. See Title 14 of the Code of Federal Regulations, which contains federal regulations pertaining to aeronautics and space. The FAA maintains federal aviation regulation manuals accessible online at *FAA Regulations*, [https://www.faa.gov/regulations\\_policies/faa\\_regulations/](https://www.faa.gov/regulations_policies/faa_regulations/) (last visited Aug. 18, 2017).
12. 49 U.S.C. § 40103(b)(1)-(2).
13. See Henry H. Perritt, Jr. & Albert Plawinski, *One Centimeter Over My Back Yard: Where Does Federal Preemption of State Drone Regulation Start?*, 17 N.C.J.L. & TECH 307 (2015).
14. Pub. L. No. 69-254.
15. 49 U.S.C. § 40103(a)(1).
16. The definition of "navigable airspace" has since been modified. It is now defined as "airspace above the minimum altitudes of flight prescribed by regulations...including airspace needed to ensure safety in the takeoff and landing of aircraft." 49 U.S.C. § 40102(a)(32).
17. *United States v. Causby*, 328 U.S. 256, 260-64 (1946).
18. The maxim is "*cujus est solum ejus usque ad coelom*," meaning "Whose is the soil, his it is up to the sky." Yehuda Abramovitch, *The Maxim "Cujus Est Solum Ejus Usque ad Coelum" as Applied in Aviation*, 8 MCGILL L.J. 247 (1961); see also 2 WILLIAM BLACKSTONE, COMMENTARIES \*18 (4th ed. 1770).
19. *Causby*, 328 U.S. at 261.
20. *Id.* at 266.
21. Similarly, what counts as "navigable airspace" has been left to the determination of the FAA, and there is "no agreement on the boundary between national airspace and outer space." *National Airspace*, BLACK'S LAW DICTIONARY (9th ed. 2009); see also NAT'L OCEANIC & ATMOSPHERIC ADMIN., WHERE IS SPACE? (Feb. 22, 2016), <https://www.nesdis.noaa.gov/content/where-space> (last visited Aug. 28, 2017); S. Neil Hosenball & Jefferson Hofgard, *Delimitation of Air Space and Outer Space: Is a Boundary Needed Now?*, 57 U. COLO. L. REV. 885 (1985).
22. *Causby*, 328 U.S. at 266 (citing N.C. GEN. STAT. § 63-11, 63-12, & 63-13, which remain in force today); see also Kevin Pomfret, *Federal Preemption of State and Local Regulations of Drones*, PROPERTY DRONE CONSORTIUM (Nov. 2015) (surveying preemption issues and arguing that "states do have some authority with regard to matters that impact aviation. The state's authority is likely to be even greater given the disruptive nature of UAS.").

23. *Causby*, 328 U.S. at 264.
24. *Id.* at 265.
25. 14 CFR Part 107—Small Unmanned Aircraft Systems. Until it was struck down by the U.S. Court of Appeals for the D.C. Circuit, the FAA’s recreational drone-owners’ registry required hobby fliers to abide by a 400-foot ceiling on drone activities. For additional discussion of the registry, see Jason Snead & John-Michael Seibler, *Purposeless Regulation: The FAA Drone Registry*, HERITAGE FOUNDATION ISSUE BRIEF No. 4514 (Feb. 4, 2016), <http://www.heritage.org/government-regulation/report/purposeless-regulation-the-faa-drone-registry>; Jason Snead & John-Michael Seibler, *Federal Drone Registry Declared Unlawful*, DAILY SIGNAL (May 19, 2017), <http://dailysignal.com/2017/05/19/federal-drone-registry-declared-unlawful/>.
26. Federal regulations set the minimum safe altitude of flight at 500 feet above ground level in noncongested areas (or below, in sparsely populated areas or over open water), or in congested areas, at 1,000 feet “above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.” FAA, *FAA Guide to Low-Flying Aircraft*, [https://www.faa.gov/about/office\\_org/field\\_offices/fsdo/lgb/local\\_more/media/FAA\\_Guide\\_to\\_Low-Flying\\_Aircraft.pdf](https://www.faa.gov/about/office_org/field_offices/fsdo/lgb/local_more/media/FAA_Guide_to_Low-Flying_Aircraft.pdf).
27. The only exception to this requirement exists in the form of a “Section 333 waiver,” for which an operator must apply if he or she desires to operate a drone in a manner not permitted under Part 107 regulations.
28. See DJI, *Phantom 3 Advanced-Flight Limits and No-Fly Zones*, [http://wiki.dji.com/en/index.php/Phantom\\_3\\_Advanced-Flight\\_Limits\\_and\\_No-Fly\\_Zones](http://wiki.dji.com/en/index.php/Phantom_3_Advanced-Flight_Limits_and_No-Fly_Zones).
29. ACADEMY OF MODEL AERONAUTICS, DOCUMENT #560, RADIO-CONTROLLED SMALL/MICRO UNMANNED AIRCRAFT SYSTEMS/MODEL AIRCRAFT OPERATIONS UTILIZING FAILSAFE, STABILIZATION, AUTOPILOT, GROUND-STATION, CAMERAS/SENSORS, <https://www.modelaircraft.org/files/560.pdf>.
30. There are perhaps hundreds of models of drones available for purchase commercially today. This discussion of drone capabilities necessarily paints with a broad brush. Some models will be more capable than others, whether in terms of range, payload, speed, or other factors. See Perritt & Plawinski, *supra* note 7, at 316.
31. See Hillary Grigonis, *Regulations on Drones Won’t Stop the Aerial Photography Industry from Booming*, BUS. INSIDER (Oct. 5, 2016), <http://www.businessinsider.com/drone-regulations-wont-stop-aerial-photography-industry-from-booming-2016-10>.
32. See Nicole Friedman, *That Drone Hovering Over Your Home? It’s the Insurance Inspector*, WALL ST. J. (Aug. 4, 2017), <https://www.wsj.com/articles/that-drone-hovering-over-your-home-its-the-insurance-inspector-1501839002>; Rebecca Smith, *Utilities Turn to Drones to Inspect Power Lines and Pipelines*, WALL ST. J. (May 5, 2015), <https://www.wsj.com/articles/utilities-turn-to-drones-to-inspect-power-lines-and-pipelines-1430881491>.
33. See Neha Chamaria, *Drone Usage in Agriculture Could Be a \$32 Billion Market*, THE MOTLEY FOOL (Nov. 25, 2016), <https://www.fool.com/investing/2016/11/25/drone-usage-in-agriculture-could-be-a-32-billion-m.aspx>; *Japan’s Agricultural Drones*, FIN. TIMES (July 1, 2015), <http://on.ft.com/2uZn4Do>.
34. See Helen Thompson, *5 Ways Drones Are Changing Real Estate*, BUS. J., Mar. 16, 2017, <https://www.bizjournals.com/bizjournals/news/2017/03/16/5-ways-drones-are-changing-real-estate.html>; Joel Aschbrenner, *FAA Says Real Estate Agents’ Drone Use Illegal*, USA TODAY (July 7, 2014), <https://www.usatoday.com/story/news/nation/2014/07/07/real-estate-drones-illegal/12299591/>.
35. See Matt McFarland, *Amazon’s Delivery Drones May Drop Packages via Parachute*, CNN TECH (Feb. 14, 2017), <http://money.cnn.com/2017/02/14/technology/amazon-drone-patent/index.html> (“The U.S. Patent and Trademark Office on Tuesday granted Amazon a patent for a method to guide packages released from drones safely to the ground. Previously the e-commerce giant had publicly released demo videos of its drones landing in yards to drop off packages. The company has testing for several years to determine the best method to deliver to customers in the future.... The patent suggests Amazon is considering keeping its drones high above customers’ homes, an approach that could be more efficient and safe.”); Chris Perez, *UPS Begins Testing Drones for Package Delivery*, N.Y. POST (Feb. 21, 2017), <http://nypost.com/2017/02/21/ups-begins-testing-drones-for-package-delivery/>.
36. See INTEL, *Intel Drones Light Up the Sky*, <https://www.intel.com/content/www/us/en/technology-innovation/aerial-technology-light-show.html> (last visited Aug. 18, 2017).
37. See Andrew Moore, *Former Combat Pilot’s Drone Business Takes Off*, UPSTATE BUS. J. (Aug. 10, 2017), <https://upstatebusinessjournal.com/news/former-combat-pilots-drone-business-takes-off/>.
38. See *The Future of Drones in America: Law Enforcement and Privacy Considerations, Hearing 113-50 Before the S. Comm. on the Judiciary*, 113th Cong. (2013), available at <https://www.judiciary.senate.gov/imo/media/doc/CHRG-113shrg81775.pdf>.
39. See *id.*; Danielle Muoio, *How Drones Are Turning Everyday Citizens into Superheroes*, BUS. INSIDER (Aug. 30, 2016), <http://read.bi/2bQnSUq>.
40. Amazon, for example, recently filed a patent for just such a hub, which is designed to service an individual city. Kanya Yuriyeff, *Amazon Patent Reveals Drone Delivery “Beehives,”* CNNTech (June 23, 2017), <http://money.cnn.com/2017/06/23/technology/amazon-drone-beehives/index.html>. Drones are also being used to deliver food in the Icelandic capital city of Reykjavik, but the devices service only a portion of the city’s total area. Jon Fingas, *Drones Are Delivering Packages in Iceland’s Capital City*, ENGADGET (Aug. 23, 2017), <https://www.engadget.com/2017/08/23/drone-delivery-service-in-iceland/>.
41. U.S. Dep’t of Trans., Fed. Aviation Admin., *Unmanned Aircraft Operations in the National Airspace System*, 72 Fed.Reg. 6689 (Feb. 13, 2007), <https://www.gpo.gov/fdsys/pkg/FR-2007-02-13/pdf/E7-2402.pdf>.

42. U.S. Dep't of Trans., Fed. Aviation Admin., Interpretation of the Special Rule for Model Aircraft 79 Fed. Reg. 36172 (June 25, 2014), <https://www.gpo.gov/fdsys/pkg/FR-2014-06-25/pdf/FR-2014-06-25.pdf>; U.S. Dep't of Trans., Fed. Aviation Admin., "Press Release—FAA Offers Guidance to Model Aircraft Operators," June 23, 2014, [https://www.faa.gov/news/press\\_releases/news\\_story.cfm?newsId=16474&cid=TW223](https://www.faa.gov/news/press_releases/news_story.cfm?newsId=16474&cid=TW223).
43. Gregory McNeal, *The Federal Government Thinks Your Backyard Is National Airspace and Toys Are Subject to FAA Regulations*, FORBES (Nov. 18, 2014), <https://www.forbes.com/sites/gregorymcneal/2014/11/18/the-federal-government-thinks-your-backyard-is-national-airspace-and-toys-are-subject-to-faa-regulations/#6339b1e85c02>.
44. FAA, *State and Local Regulation of Unmanned Aircraft Systems (UAS) Fact Sheet* (Dec. 17, 2015), [https://www.faa.gov/uas/resources/uas\\_regulations\\_policy/media/uas\\_fact\\_sheet\\_final.pdf](https://www.faa.gov/uas/resources/uas_regulations_policy/media/uas_fact_sheet_final.pdf).
45. In one recent case, a judge agreed that a local drone ordinance enacted by Newton, Massachusetts, exceeded the city's authority to regulate UAS operations. The judge relied heavily on the FAA's "State and Local Regulation of Unmanned Aircraft Systems" fact sheet but did not agree that UAS regulations are subject to field preemption. Rather, specific measures adopted by the city were declared conflict preempted, and the judge invited the city of Newton to redraft the measure. *Singer v. City of Newton*, No. CV 17-10071-WGY, 2017 WL 4176477 (D. Mass. Sept. 21, 2017).
46. For a discussion of case law surrounding the bounds of manned aviation regulatory preemption, see Perritt and Plawinski *supra* note 13, at 331-350.
47. A recent study by NASA indicates that the characteristic "buzz" generated by drones may in fact be perceived as a significantly greater nuisance than similarly noisy terrestrial vehicles, including cars and trucks. Andrew Christian and Randolph Cabell, *Initial Investigation into the Psychoacoustic Properties of Small Unmanned Aerial System Noise*, NASA LANGLEY, <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20170005870.pdf>.
48. U.S. CONST., amend X; *Berman v. Parker*, 348 U.S. 26, 32 (1954) ("An attempt to define its reach or trace its outer limits is fruitless, for each case must turn on its own facts.... Public safety, public health, morality, peace and quiet, law and order—these are some of the more conspicuous examples of the traditional application of the police power to municipal affairs. Yet they merely illustrate the scope of the power and do not delimit it."); Charles Cooper, *Reserved Powers of the States*, in THE HERITAGE GUIDE TO THE CONSTITUTION, <http://www.heritage.org/constitution/#!/amendments/10/essays/163/reserved-powers-of-the-states>.
49. *Cipollone v. Liggett Group*, 505 U.S. 504, 515 (1992) (citing *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 230 (1947) ("[W]e start with the assumption that the historic police powers of the States were not to be superseded by the Federal Act unless that was the clear and manifest purpose of Congress."); see also *Skysign Int'l, Inc. v. City & Cty. of Honolulu*, 276 F.3d 1109, 1117 (9th Cir. 2002) (citing 49 U.S.C. § 40103(b)(2) (B) (1994)) ("Although Congress has directed the FAA to 'prescribe air traffic regulations in the flight of aircraft (including regulations on safe altitudes) for...protecting individuals and property on the ground,' it has not precluded 'local regulation with an identical purpose that does not actually reach into the forbidden, exclusively federal areas, such as flight paths, hours, or altitudes' for manned aviation.").
50. See *Sligh v. Kirkwood*, 237 U.S. 52 (1915).
51. See *Members of City Council of City of Los Angeles v. Taxpayers for Vincent*, 466 U.S. 789 (1984); *Cox v. State of La.*, 379 U.S. 536, 554 (1965) (noting that the "Court has dealt in many decisions" with "the right of a State or municipality to regulate the use of city streets and other facilities to assure the safety and convenience of the people in their use and the concomitant right of the people of free speech and assembly" and collecting cases).
52. See, e.g., *Sligh*, 237 U.S. at 52; *Skysign Int'l, Inc.*, 276 F.3d at 1116 (agreeing "with the United States that § 40103(a)(1) does not in and of itself exclude any state regulation of aerial advertising"); *Patel v. Texas Dep't of Licensing & Regulation*, 469 S.W.3d 69, 92 (Tex. 2015) (Willett, J., concurring).
53. See *McDonald v. City of Chicago, Ill.*, 561 U.S. 742, 931 (2010) (Breyer, J., dissenting); *Bond v. United States*, 134 S. Ct. 2077, 2089 (2014) ("Perhaps the clearest example of traditional state authority is the punishment of local criminal activity.").
54. See *Madsen v. Women's Health Ctr., Inc.*, 512 U.S. 753, 772 (1994) (stating that "in upholding a local noise ordinance around public schools, 'the nature of a place, the pattern of its normal activities, dictate the kinds of regulations...that are reasonable.'").
55. See *The James Gray*, 62 U.S. 184, 191 (1858).
56. See *C & A Carbone, Inc. v. Town of Clarkstown, N.Y.*, 511 U.S. 383, 389 (1994).
57. See *Yates v. City of Milwaukee*, 77 U.S. 497 (1870).
58. See *Drye v. United States*, 528 U.S. 49, 58 (1999); *BFP v. Resolution Tr. Corp.*, 511 U.S. 531, 544 (1994).
59. See *Hess v. Port Authority Trans-Hudson Corporation*, 513 U.S. 30, 44 (1994) ("[R]egulation of land use [is] a function traditionally performed by local governments").
60. See *Minnesota Rate Cases*, 230 U.S. 352, 411 (1913) ("Within the state power, then...is 'that immense mass of legislation which embraces everything within the territory of a state, not surrendered to the general government; all which can be most advantageously exercised by the states themselves. Inspection laws, quarantine laws, health laws of every description, as well as laws for regulating the internal commerce of a state, and those which respect turnpike roads, ferries, etc., are component parts of this mass. No direct general power over these objects is granted to Congress: and, consequently, they remain subject to state legislation. If the legislative power of the Union can reach them, it must be for national purposes; it must be where the power is expressly given for a special purpose, or is clearly incidental to some power which is expressly given.'") (citing *Gibbons v. Ogden*, 22 U.S. 1, 78 (1824)); *Vill. of Euclid, Ohio v. Ambler Realty Co.*, 272 U.S. 365, 394 (1926).

61. Cf. Barbara Grzincic, *D.C. Circuit Strikes FAA's Revised Flight Paths for Phoenix Airport*, REUTERS LEGAL (Aug. 29, 2017), <https://www.reuters.com/article/faa-phoenix-idUSL2N1LF26G> (“A divided panel of the U.S. Court of Appeals for the D.C. Circuit vacated the FAA’s September 2014 order changing the air corridors at Sky Harbor as part of its national NextGen air-traffic modernization program. Circuit Judges Thomas Griffith and Judith Rogers said the FAA acted arbitrarily in establishing new flight patterns in Phoenix. The agency’s failure to notify affected communities or seek public comment, as well as its conclusion that the project would not have a significant environmental impact, violated the National Environmental Protection Act, the National Historic Preservation Act, and the Transportation Act.”).
62. In *Village of Belle Terre v. Boraas*, 416 U.S. 1 (1974), the Court acknowledged that it will “deal with economic and social legislation” on the basis of “a rational relationship to a (permissible) state objective.” *Id.* at 8. That analysis often considers local circumstances justifying particular rules in a way that may ask too much of the FAA.
63. See U.S. DEP’T OF TRANS., FED. AVIATION ADMIN., LAW ENFORCEMENT GUIDANCE FOR SUSPECTED UNAUTHORIZED UAS OPERATIONS 5 (2016).
64. Both liberal and conservative Justices of the U.S. Supreme Court have “recognized a compelling need to allow local government ‘a reasonable opportunity to experiment with solutions to admittedly serious problems.’” *Carey v. Brown*, 447 U.S. 455, 489 (1980) (Rehnquist, J., dissenting) (citing *Young v. Am. Mini Theatres, Inc.*, 427 U.S. 50, 71 (1976) (Stevens, J., plurality opinion)).
65. Sen. Dianne Feinstein (D-CA) introduced S. 1272, *supra* note 1, for herself and Sens. Richard Blumenthal (D-CN), Tom Cotton(R-AR), and Mike Lee (R-UT).
66. The FAA reported that approximately 820,000 registrations had been completed before the court’s decision. See April Glaser, *Americans No Longer Have to Register Non-commercial Drones with the FAA*, RECODE (May 19, 2017), <https://www.recode.net/2017/5/19/15663436/us-drone-registration-rules-faa>. In February 2016, the FAA reported that the number of registered drone owners (then 325,000) exceeded the number of licensed pilots at the time (320,000). *FAA Says There Are Now More Registered Drone Operators Than Licensed Pilots*, CBS (Feb. 8, 2016), <https://www.cbsnews.com/news/more-registered-drone-operators-than-licensed-pilots-faa-says/>.
67. April Glaser, *The FAA Has Issued Nearly 23,000 Drone Pilot Licenses in Just Three Months*, RECODE (Dec. 19, 2016), <https://www.recode.net/2016/12/19/14006772/faa-drone-pilot-licenses-three-months-numbers-uav>.
68. Rose Eveleth, *A Map of Every Passenger Plane in the Skies at This Instant*, SMITHSONIAN MAG. (Sept. 17, 2012), <http://bit.ly/2v0TVLA>.
69. See FED. AVIATION ADMIN., 2015 PERFORMANCE AND ACCOUNTABILITY REPORT, 2016, [https://www.faa.gov/about/plans\\_reports/media/20150FAA-PAR.pdf](https://www.faa.gov/about/plans_reports/media/20150FAA-PAR.pdf).
70. See U.S. DEP’T OF JUSTICE, OFFICE OF JUSTICE PROGRAMS, BUREAU OF JUSTICE STATISTICS, NCJ 233982, *Census of State and Local Law Enforcement Agencies, 2008* (2011), <https://bjs.gov/content/pub/pdf/csll08.pdf>.
71. David Reid, *Supersonic Flight Promised by 2023 as Boom Announces Airline Orders*, CNBC News (June 20, 2017), <http://cnb.cx/2uPVJYk>; John Markoff, *No Longer a Dream: Silicon Valley Takes On the Flying Car*, N.Y. TIMES (Apr. 24, 2017), <http://nyti.ms/2wi94sx>; Cecilia Rodriguez, *Flying Cars Take Off and Are Set for Sale for up to \$1.6 Million*, FORBES (Apr. 23, 2017), <http://bit.ly/2f5wyh5>.
72. U.S. DEP’T OF TRANS., FED. AVIATION ADMIN., LAW ENFORCEMENT GUIDANCE FOR SUSPECTED UNAUTHORIZED UAS OPERATIONS 5 (2016).
73. See Edwin Meese III, *How Washington Subverts Your Local Sheriff*, HOOVER INST. POL’Y REV. (Mar. 1, 1996), <https://www.hoover.org/research/how-washington-subverts-your-local-sheriff>; Edwin Meese III, *Federalism in Law Enforcement*, 2 FED. SOC. CRIM. L. & PROC. PRACTICE GROUP NEWSLETTER (Spring 1998), <https://fedsoc.org/commentary/publications/federalism-in-law-enforcement>; Paul J. Larkin, Jr., *Reorganizing the Federal Administrative State: The Disutility of Criminal Investigative Programs at Federal Regulatory Agencies*, HERITAGE FOUNDATION LEGAL MEMORANDUM No. 208 (July 12, 2017), <http://www.heritage.org/sites/default/files/2017-07/LM-208.pdf> (in short, “[t]he law enforcement and regulatory cultures are markedly different, and attempting to cram the former into an agency characterized by the latter hampers effective law enforcement”).
74. Those that operate in a manner fundamentally similar to manned aircraft should be regulated as such. However, those that will generally fly at lower altitudes, among or mere feet above towns, cities, and private property, and which by volume alone will affect a far greater percentage of the population require a localized regulatory framework distinct from manned aviation. See Raphael Pirker, N.T.S.B. Order No. EA-5730, No. CP-217, at 2-3 (Nov. 8, 2014); Jason Snead & John-Michael Seibler, *Redefining “Aircraft,” Defining “Drone”: A Job for the 115th Congress*, HERITAGE FOUNDATION LEGAL MEMORANDUM No. 197 (Jan. 13, 2017), [http://www.heritage.org/sites/default/files/2017-01/LM-197\\_0.pdf](http://www.heritage.org/sites/default/files/2017-01/LM-197_0.pdf).
75. See Troy Rule, *Drone Zoning*, 95 N.C. L. REV. 133 (2016); Michael Widener, *Local Regulating of Drone Activity in Lower Airspace*, 22 B.U. J. Sci. & TECH. L. 239 (2016).
76. The presidential memorandum authorizes the Secretary of Transportation to approve local drone operations up to 400 feet on a case-by-case basis.
77. Even if, or more likely when, drones develop the capability to travel further afield, there is little reason to fear the “patchwork.” The FAA could grant access to airspace above that regulated by state and local operators, permitting transit from one locale to another while avoiding jurisdictions in between. This would avoid the fears espoused by “patchwork” advocates who envision long-haul drone operators dogged by countless sets of varied rules, as these flights would be subject to FAA jurisdiction.
78. FAA, *B4UFLY Mobile App*, [https://www.faa.gov/uas/where\\_to\\_fly/b4uflly/](https://www.faa.gov/uas/where_to_fly/b4uflly/).