
Note

Remodeling “Model Aircraft”: Why Restrictive Language That Grounded the Unmanned Industry Should Cease To Govern It

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INTRODUCTION

In late 2011, the Federal Aviation Administration (FAA) issued a \$10,000 fine to Raphael Pirker for flying a “five-pound styrofoam [sic] model airplane” over the University of Virginia.¹ The University had hired Lewis Communications to supply aerial photographs and video of its new medical center and campus, and Lewis Communications in turn compensated Pirker for conducting the flight and capturing the desired film.² When the FAA sent him a letter of investigation by e-mail alleging that he had recklessly operated a small unmanned aerial system (UAS or sUAS)—more colloquially known as a “drone”³—

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1. Patrick Egan, *Pirker Submits Reply Brief in Response to the FAA’s Appeal*, sUAS NEWS (May 13, 2014), <http://www.suasnews.com/2014/05/29199/pirker-submits-reply-brief-in-response-to-the-faas-appeal>; see also Pirker, Docket No. CP-217, 2014 WL 3388631, at *1 (N.T.S.B. Mar. 6, 2014).

2. FAA, PIRKER INVESTIGATION, <http://www.scribd.com/doc/223797459/Pirker-Investigation>.

3. Drones, or UAS, come in a variety of shapes and sizes. See, e.g., Ian Bott, Cleve Jones & John Burn-Murdoch, *Great and Small: The Many Types of Drone*, FIN. TIMES (Oct. 8, 2013, 6:53 PM), <http://www.ft.com/intl/cms/s/0/2eeba9b0-21d5-11e3-bb64-00144feab7de.html>. Their forms span that of the mammoth Global Hawk to that of Pirker’s five pound Styrofoam model airplane. UAS weighing less than 55 pounds under current law, see FAA Modern-

and endangered persons and property on the ground, Pirker fought the allegations.⁴ The resulting contest ignited a debate long brewing about the federal government's role in regulating UAS in the national airspace.⁵

The FAA asserts regulatory authority over commercial UAS.⁶ Although some commentators argue that the FAA has no such authority,⁷ the FAA, unsurprisingly, says otherwise. Its policy statement, issued in 2007, explains that "no person may operate a UAS in the National Airspace System without specific authority."⁸ Pursuant to this policy, the FAA makes obtaining such authority exceedingly difficult,⁹ and voraciously seeks to curb operations that come to its attention.¹⁰ In the meantime, the FAA Modernization and Reform Act of 2012 (FMRA), which directs the FAA to issue comprehensive regulations for the operation of UAS in the national airspace, has substantially hampered individuals' ability to utilize UAS for commercial purposes for the foreseeable future.¹¹

ization and Reform Act of 2012, Pub. L. No. 112-95, § 336(a)(3), 126 Stat. 11, 77 (2012), are typically referred to as sUAS, or "small" UAS. For simplicity's sake, this Note will group UAS and sUAS into the category of "UAS."

4. See *infra* notes 91–93 and accompanying text.

5. See generally Pirker, Docket No. CP-217, 2014 WL 8095629 (N.T.S.B. Nov. 17, 2014) *rev'g* Docket No. CP-217, 2014 WL 3388631 (N.T.S.B. Mar. 6, 2014). Pirker won the first battle, but the N.T.S.B. narrowly reversed on appeal and remanded the case for a determination of recklessness. See Pirker, 2014 WL 8095629, at *5. Pirker and the FAA subsequently settled the case, and Pirker agreed to pay \$1,100 with no admission of wrongdoing or regulatory violation. *Pirker Drone Case Reaches Settlement*, GEOSPATIAL SOLUTIONS (Jan. 30, 2015), <http://geospatial-solutions.com/pinker-drone-case-reaches-settlement>.

6. See generally FAA Modernization and Reform Act of 2012, §§ 331–36, (Unmanned Aircraft Systems).

7. See, e.g., Peter Sachs, *Current U.S. Drone Law*, DRONE L.J. (Dec. 14, 2013), <http://dronelawjournal.com>; Egan, *supra* note 1.

8. Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. 6689, 6690 (Feb. 13, 2007) (codified at 14 C.F.R. pt. 91).

9. See Wendie L. Kellington & Michael Berger, *Why Land Use Lawyers Care About the Law of Unmanned Systems*, 37 ZONING & PLAN. L. REP., June 2014, at 1, 4.

10. FAA, FOIA RESPONSE LETTERS, <http://www.scribd.com/doc/204615520/FAA-FOIA-Response-2-4-14> (last visited Oct. 15, 2015) (cease-and-desist letters).

11. See FAA Modernization and Reform Act of 2012, §§ 332–36; *infra* Part III. Although the FAA began streamlining its approval process and has now issued over a thousand approvals to companies seeking to use UAS, the universal approval requirements hinder certain individuals and small companies seeking to use the technology. See Clay Dillow, *FAA Approves More than 1,000*

The FAA's position meets fierce opposition from myriad scholars¹² and organizations¹³ who preach the value of a thriving UAS industry, alongside concerns that regulatory delay will stunt its growth.¹⁴ The FAA's cautious approach lags far behind the process in other countries.¹⁵ Although the FAA has released its proposed regulations,¹⁶ the time required for public comment, and the possibility of their revision,¹⁷ has led commentators to question the FAA's capacity to meet the rapidly approaching September 2015 deadline for final rules as specified in the FMRA.¹⁸ Nevertheless, the FAA cites its obligation to shield the national airspace from the dangers that widespread UAS presence presents as the prime reason for its delay, and

Commercial Drone Permits, FORTUNE (Aug. 9, 2015), <http://fortune.com/2015/08/09/faa-commercial-drone-permits>.

12. See, e.g., Nicholas Ryan Turza, *Dr. Dronelove: How We Should All Learn To Stop Worrying and Love Commercial Drones*, 15 N.C. J.L. & TECH. 319 (2014).

13. See Kellington & Berger, *supra* note 9, at 5.

14. See Bart Jansen, *Federal Appeal May Define FAA Authority over Drones*, USA TODAY (July 2, 2014, 5:13 PM), <http://www.usatoday.com/story/money/business/2014/07/02/ntsb-drones-faa-appeal-pirker/11793203> (noting the expected industry growth and the effect of probable regulatory delay).

15. See, e.g., Pierre Chauvin, *Canada Is Handling Drones Better than the United States*, MOTHERBOARD (Aug. 13, 2014, 9:18 AM), <http://motherboard.vice.com/read/canada-has-a-consumer-drone-problem>; Brian Fung, *The FAA Won't Make Up Its Mind on Drone Rules Until 2017 at the Earliest*, WASH. POST (Dec. 10, 2014), <https://www.washingtonpost.com/news/the-switch/wp/2014/12/10/the-faa-wont-make-up-its-mind-on-drone-rules-until-2017-at-the-earliest> ("Some [businesses] have even threatened to move their drone research overseas if they can't get permission to operate in the United States."); cf. Kellington & Berger, *supra* note 9, at 4–5 (noting the FAA's persistent tardiness).

16. See FAA, OVERVIEW OF SMALL UAS NOTICE OF PROPOSED RULEMAKING: SUMMARY OF MAJOR PROVISIONS OF PROPOSED PART 107 (2015), http://www.faa.gov/regulations_policies/rulemaking/media/021515_suas_summary.pdf; Press Release, DOT and FAA Propose New Rules for Small Unmanned Aircraft Systems, FAA (Feb. 15, 2015), https://www.faa.gov/news/press_releases/news_story.cfm?newsId=18295 (announcing proposed rules and declaring that all "non-recreational operations" will be subject to them).

17. See Frederic Lardinois, *FAA Proposes Rules To Open the Sky to Some Commercial Drones, but Delivery Drones Remain Grounded*, TECHCRUNCH (Feb. 15, 2015), <http://techcrunch.com/2015/02/15/proposed-faa-rules-will-open-the-sky-for-some-commercial-drones-but-delivery-drones-remain-grounded> (noting that it could take a year or two before the FAA's rules, and any changes to them, can take effect).

18. See FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 332(a)(1), (a)(3), 126 Stat. 11, 73 (2012).

reasonably so.¹⁹ As this Note argues, however, the FAA's authority to regulate airspace does not, and should not, extend absolutely to all aspects of the national airspace. Rather, it should extend predominantly to "navigable airspace."²⁰

The Supreme Court in *United States v. Causby* recognized that Congress's professed power "to possess and exercise complete and exclusive national sovereignty in [national] air space" derives in fact from its plenary power, under the Constitution's Commerce Clause, "to control *navigable* airspace."²¹ The majority also carved out an individual property interest in "at least as much of the space above the ground as [the landowner] can occupy *or use* in connection with the land."²² This language generated significant discussion as to the extent of the individual interest in airspace over one's land, as well as to the extent of federal, state, and local authority to regulate that airspace.²³ The commercial potential for UAS, and a comprehensive federal obstruction to their use, bring these issues urgently to the forefront.

Part I of this Note provides a snapshot of the current state of airspace regulation and explores, in relevant part, the history behind it and the competing theories driving it. Part II proceeds to weigh the validity and respective benefits of these theories insofar as they help or hinder efforts to integrate UAS into national airspace. Part III then articulates why a more balanced allocation of regulatory power would serve relevant individual and governmental interests, as well as the essential structure of American federalism. The root problem, this Note suggests, is the FMRA's exclusion of all commercial UAS from

19. See Taylor Berman, *Remote Control Helicopter Partially Decapitates Teen in Brooklyn Park*, GAWKER (Sept. 5, 2013, 6:25 PM), <http://gawker.com/remote-control-helicopter-partially-decapitates-teen-in-1259586314>.

20. See *United States v. Causby*, 328 U.S. 256, 271 (1946) (Black, J., dissenting); see also 14 C.F.R. § 91.119(b)–(c) (2015) (defining the low mark of "navigable airspace" as 1,000 feet above "congested areas" and 500 feet above "open water or sparsely populated areas").

21. *Causby*, 328 U.S. at 271–72 (emphasis added) (internal quotation marks omitted).

22. *Id.* at 264 (emphasis added).

23. See generally *Griggs v. County of Allegheny*, 369 U.S. 84 (1962) (holding that the noise from aircraft landing and taking off constituted a taking if it made nearby homes unbearable for residential use); Colin Cahoon, *Low Altitude Airspace: A Property Rights No-Man's Land*, 56 J. AIR L. & COM. 157 (1990) (detailing landowners' property rights in airspace and pointing out unresolved legal questions).

the definition of “model aircraft.”²⁴ Redefining “model aircraft” to allow use “for hobby, recreational, or other use not in or affecting interstate commerce” would pave the way for a richer, more effective system of airspace regulation, and in doing so, finally allow the unmanned industry to take flight.

I. HARNESSING AIRSPACE: THE HISTORY BEHIND THE MODERN FRAMEWORK

Airspace regulation can seem an unintelligible knot, but this facade can be untangled. Doing so requires a careful review of the regulatory powers that be, and their role throughout history. Section A first explains the origins and early development of airspace law. Section B then provides an overview of *United States v. Causby*, a formative decision in the development of airspace regulation, and one that articulates with some precision the authority underlying federal regulatory efforts. Notable doctrine flowing from *Causby*, and its impact on current regulatory efforts, is addressed in Section C. Lastly, Section D reviews the role of the states in harnessing airspace, and the metric of difference between state and federal regulatory power in scope, foundation, and significance.

A. COELUM: RELEGATING AIRSPACE TO REGULATION PRE-CAUSBY

Before the advent of the aircraft, the Latin maxim *cujus est solum, ejus est usque ad coelum*—or rather, the owner of the soil owns up to the sky—remained a staple of the common law.²⁵ Lord Coke promulgated the maxim fervently in his time,

24. See FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(c), 126 Stat. 11, 77–78 (2012). This definition remains controlling under the FAA’s proposed rules. See *supra* note 16.

25. See ROBERT R. WRIGHT, *THE LAW OF AIRSPACE* 7 (1968). The maxim is thought to have originated under Roman law, and does not refer to ownership of the air—“*aër*” was “the gas that flowed over the earth’s surface,” and was “incapable of appropriation”—but of the “*coelum*,” or “the area through which the air flowed,” which remained “capable of private ownership.” STUART BANNER, *WHO OWNS THE SKY? THE STRUGGLE TO CONTROL AIRSPACE FROM THE WRIGHT BROTHERS ON* 86 (2008). Although there remains uncertainty as to the nature of the property interest protected by the maxim, see, e.g., Howard H. Hackley, *Trespassers in the Sky*, 21 MINN. L. REV. 773, 777 (1937) (suggesting the maxim only guaranteed a right to freedom from interference, but not ownership); cf. *Lyman v. Hale*, 11 Conn. 177, 177 (1836) (“If a tree, the trunk of which stands on the land of A, extend some of its branches over . . . the land of B . . . such overhanging branches and the fruit thereof[] [are] the sole property of A . . .”), American courts frequently invoked the doctrine to identify

and American courts met it with nearly “unquestioning acceptance.”²⁶ Unsurprisingly, the doctrine’s traditional utility manifested in tort and property law; specifically, in nuisance, trespass, and ejectment.²⁷ There seemed little doubt that airspace was, in fact, property, and that the common law afforded it protection.²⁸ However, in the face of technological innovations, courts grew reluctant to enforce absolutely landowners’ airspace rights under the maxim.²⁹ They increasingly refused to recognize or compensate actionable trespasses by planes flying thousands of feet above the property in question.³⁰ This, in turn, posed a troubling prospect: commercial air travel would constitute “[f]requent and universal trespass on a large scale, theoretically banned by the law,” but seldom deterred by it.³¹

Though legal reformers contemplated several different solutions to this problem, sweeping federal regulation, in the form of the Air Commerce Act of 1926 (ACA), ultimately prevailed.³² The ACA, without explicitly saying so, derived its power from the Commerce Clause—it delegated to the Secretary of Commerce critical powers, including the authority to

one’s airspace as one’s property, and intrusion therein as trespass or nuisance. See generally 2 HERBERT THORNDIKE TIFFANY, *THE LAW OF REAL PROPERTY* § 583 (3d ed. 1939) (explaining a landowner’s rights above the surface).

26. TIFFANY, *supra* note 25.

27. See WRIGHT, *supra* note 25, at 211.

28. See, e.g., *Butler v. Frontier Tel. Co.*, 186 N.Y. 486, 491 (1906) (“What does the term [‘real property’] include so far as the action of ejectment is concerned? . . . The surface of the ground is a guide, but not the full measure; for within reasonable limitations land includes not only the surface but also the space above and the part beneath.”); WRIGHT, *supra* note 25, at 213 (“Blackstone, building upon Coke, had stated that the word ‘land’ includes not only the face of the earth, but every thing under it, or over it.” (internal quotation marks omitted)).

29. See BANNER, *supra* note 25, at 99–101.

30. See *id.*

31. *Id.* at 71.

32. See Air Commerce Act of 1926, Pub. L. No. 69-251, ch. 344, 44 Stat. 568 (1926); BANNER, *supra* note 25, at 102–34 (documenting the history and evolving scope of the Air Commerce Act of 1926). Prior to this Act, many in the legal community feared extensive federal control in this arena. Some hoped that courts might ultimately effect a change in the common law, while others advocated widespread government condemnation of all landowners’ airspace, a solution which promised peculiar administrative burdens and democratic difficulties. See *id.* at 98–99. There were also considerable, though ultimately fruitless, efforts to harmonize state laws on air travel and eliminate inconsistencies that typically make federal interference attractive. See *id.* at 104. Though these efforts did not prevail, their ideological underpinnings remain a persistent, and relevant, counterpoint to federal regulatory efforts.

"designate and establish civil airways,"³³ to prescribe the contours of the navigable airspace,³⁴ and to "[e]stablish air traffic rules for the navigation, protection, and identification of aircraft."³⁵ From the outset, the Act established a salient difference between "air commerce" and "interstate or foreign air commerce," and subjected only *interstate* air commerce to many of its precepts.³⁶ States, therefore, retained a regulatory role in the Act's structure of airspace regulation, so long as State "airspace reservations" were either "necessary" or "not in conflict [] with . . . any civil or military airway [so] designated."³⁷ In other words, states were given authority to regulate so long as their regulations did not interfere with federal regulations. Although the Act seemed to abrogate the common law *coelum* maxim, the regulatory framework created would prove unable to adequately address the regulatory needs prompted by developments in air travel, and *coelum* advocates persisted, albeit weakened somewhat by changing economic and social needs of the time.³⁸

Congress subsequently amended the ACA with the Civil Aeronautics Act (CAA). The CAA created the Civil Aeronautics Board, an agency vested with broader powers than the Secre-

33. Air Commerce Act § 5(b). The term "civil airway" was defined as "a route in the navigable airspace designated by the Secretary of Commerce as a route suitable for interstate or foreign air commerce." *Id.* § 9(j).

34. *Id.* § 10 ("'[N]avigable airspace' means airspace above the minimum safe altitudes of flight prescribed by the Secretary of Commerce . . . and such navigable airspace shall be subject to a public right of freedom of interstate and foreign air navigation in conformity with the requirements of this Act.").

35. *Id.* § 3(e).

36. *Compare id.* § 1 ("'[A]ir commerce' means transportation in whole or in part by aircraft of persons or property for hire, navigation of aircraft in furtherance of a business, or navigation of aircraft from one place to another for operation in the conduct of a business."), *with id.* § 3(c) ("'[I]nterstate or foreign air commerce' means air commerce between any State, Territory, or possession, or the District of Columbia, and any place outside thereof; or between points within the same State, Territory, or possession, or the District of Columbia, but through the airspace over any place outside thereof; or wholly within the airspace over any Territory or possession, or the District of Columbia."), *and supra* notes 33–34.

37. Air Commerce Act § 4; *see also id.* § 1 (defining "interstate or foreign air commerce" in a manner that excludes air navigation confined to intrastate commerce).

38. *Cf. Cory v. Physical Culture Hotel*, 14 F. Supp. 977, 982 (1936) (recognizing landowners' "exclusive right to so much of the space above *as may be actually occupied and used* by him and necessarily incident to such occupation and use" (emphasis added)).

tary of Commerce under the ACA.³⁹ The CAA contained a noticeably stronger definition of air commerce that included “*interstate . . . air commerce . . . by aircraft or any operation or navigation of aircraft within the limits of any civil airway or any operation or navigation of aircraft which directly affects, or which may endanger safety in, interstate . . . air commerce.*”⁴⁰ It granted citizens “a public right of freedom of transit in air commerce through the navigable air space of the United States” in a separate section, rather than in the navigable airspace section.⁴¹ Taken together, the changes reflected Congress’s move towards a heavier federal influence in the regulation of airspace. It preserved the public right of access to the navigable airspace granted in the ACA, but implied that any air commerce within non-navigable airspace would remain subject to extensive federal regulation.⁴²

However substantial this federal influence became, its purpose remained confined to smoothing relations between air carriers and ensuring safe travel in a manner comparable to the ACA—not abrogating all private interest in airspace.⁴³ The Supreme Court’s paradigmatic decision in *United States v. Causby* addressed this limitation directly, using the Fifth Amendment’s Takings Clause as a vessel.⁴⁴

B. CAUSBY, THE COMMERCE CLAUSE, AND THE TAKING OF AIRSPACE

The federal government’s authority to regulate airspace is “bottomed on the commerce power of Congress.”⁴⁵ On this basis, congressional authority over the navigable airspace mirrored

39. See Civil Aeronautics Act of 1938, Pub. L. No. 75-706, §§ 701–02, 52 Stat. 973, 1012–14 (1938) (creation and organization of board, duties of the board); see also 49 U.S.C. § 401 (1940).

40. 49 U.S.C. § 401 (emphasis added). Similarly important definitions, such as those of “civil airway” and “navigable air space,” remained virtually unchanged. *Id.*

41. *Id.* § 403.

42. See *id.*

43. See *id.* §§ 2–3; Air Commerce Act of 1926, Pub. L. No. 69-251, ch. 344, §§ 1–2, 44 Stat. 568, 568–69 (1926).

44. See *United States v. Causby*, 328 U.S. 256, 261–67 (1946) (holding that the interference of use and enjoyment of land by low and frequent flying aircraft constitutes a taking); see also U.S. CONST. amend. V, § 4 (“[N]or shall private property be taken for public use without just compensation.”).

45. *Braniff Airways v. Neb. State Bd. of Equal. & Assess.*, 347 U.S. 590, 596 (1954).

Congress’s plenary power over navigable waters.⁴⁶ The ACA’s legislative history confirms this, linking the declaration of what constitutes both navigable airspace and navigable waters to federal authority over interstate commerce.⁴⁷ Although Congress considered using its war power to commandeer airspace—subsuming state power therein—it notably chose a different route.⁴⁸

This so-called “different route” remains expansive in many respects. The unfettered commerce power “acknowledges no limitations, other than are prescribed in the constitution [sic].”⁴⁹ The Court has identified three categories of activity to which it extends: (1) “the use of the *channels* of interstate commerce”; (2) “the *instrumentalities* of interstate commerce, or persons or things in interstate commerce”; and (3) “those activities that *substantially affect* interstate commerce.”⁵⁰ Intrastate activities are not exempt where “the interstate and intrastate aspects of commerc[ial] [activity are] so mingled together that full regulation of interstate commerce require[s] incidental regulation of intrastate commerce.”⁵¹ Likewise, where regulation of small-scale intrastate activities constitutes “an essential part of a larger regulation of economic activity, in which the regulatory scheme could be undercut unless the intrastate activity were regulated,” such regulation is constitutionally permissible.⁵² Nonetheless, the Constitution requires a distinction be-

46. See *Causby*, 328 U.S. at 272 (Black, J., dissenting); Scott P. Keifer, *Aircraft Overflights as a Fifth Amendment Taking: The Extension of Damages for the Loss of Potential Future Uses to Avigation Easements*, 4 MO. ENVTL. L. & POL’Y REV. 88, 92 & n.87 (1996) (“[A]ir space . . . present[s] as to transportation practical and legal problems similar to those presented by transportation by vessels upon the high seas.”).

47. *Braniff Airways*, 347 U.S. at 596–97 (citing legislative history).

48. See CHARLES S. RHYNE, *THE CIVIL AERONAUTICS ACT ANNOTATED WITH THE CONGRESSIONAL HISTORY WHICH PRODUCED IT, AND THE PRECEDENTS UPON WHICH IT IS BASED* 67 (1939). One of the prime reasons for this choice seems to be Congress’s desire to consolidate authority over air, water, and railroad transportation so as to ensure “impartial regulation . . . by a body which has no greater responsibility for or interest in one than another.” *Civil Aeronautics Act of 1938: Hearing on H.R. 5234 and H.R. 4652 Before the H. Comm. on Interstate and Foreign Commerce*, 75th Cong. 32 (1937) (statement of Hon. Joseph B. Eastman, Interstate Commerce Commission).

49. *Gibbons v. Ogden*, 9 Wheat. 1, 196 (1824) (commerce on navigable waters).

50. *United States v. Lopez*, 514 U.S. 549, 558–59 (1995) (emphasis added).

51. *Id.* at 554 (citing *Shreveport Rate Cases*, 234 U.S. 342 (1914)).

52. *Id.* at 561. See generally *Wickard v. Filburn*, 317 U.S. 111 (1942) (holding that Congress’s commerce power extends to intrastate activities which affect interstate commerce).

tween that which is “truly national” and “truly local,” and areas traditionally within the ambit of States’ “police power”⁵³ remain particularly resistant to this centralized authority.⁵⁴

At the time *United States v. Causby* caught the Supreme Court’s attention, Congress’s authority to regulate airspace under the Commerce Clause was not in question; it was assumed that such authority extended as far as its commerce power allowed.⁵⁵ Rather, the majority opinion in *Causby*, penned by Justice Douglas, directly addressed the modern utility of the *coelum* maxim, and its incompatibility with flight technology. Plaintiffs owned a chicken farm plagued by frequent military overflights that generated sounds and lights so disruptive that they spooked upwards of 150 chickens who flew into the walls and died.⁵⁶ The owners argued that these low-altitude flights constituted a “taking” of their property for public use within the meaning of the Fifth Amendment.⁵⁷ While the Court rejected the *coelum* maxim as having “no place in the modern world,” it agreed that the overflights had “taken” property from the owners.⁵⁸ Both the majority opinion and Justice Black’s dissent relied on an interpretation of the ACA, and its definition of “navigable airspace.”⁵⁹

Causby expressly found a property interest in the “immediate reaches of the enveloping atmosphere,” which signaled the Court’s view on the extent of Congressional authority in airspace.⁶⁰ As the majority reasoned, frequent, low overflights

53. Police power includes “[t]he power of a state to enforce laws for the health, welfare, morals, and safety of its citizens, if enacted so that the means are reasonably calculated to protect those legitimate state interests.” *State Police Power*, BLACK’S LAW DICTIONARY (10th ed. 2014). This power is discussed in greater detail *infra* Part I.D.

54. *United States v. Morrison*, 529 U.S. 598, 599 (2000).

55. *See United States v. Causby*, 328 U.S. 256, 260 (1946); *id.* at 272 (Black, J., dissenting).

56. *See id.* at 259 (majority opinion).

57. *See id.* at 258.

58. *Id.* at 261; *see also id.* at 267 (finding that “a servitude ha[d] been imposed upon the land”).

59. *Compare id.* at 263–64 (recognizing the importance of placing “navigable airspace . . . within the public domain” to interstate commerce in the modern world, and affirming that the “Civil Aeronautics Authority has, of course, the power to prescribe air traffic rules”), *with id.* at 271–72 (Black, J., dissenting) (arguing that because “the Constitution entrusts Congress with full power to control all navigable airspace,” and further, because “there was no showing that the bombers flying over [the chicken farm] violated any rule or regulation of the Civil Aeronautics Authority,” there could be no taking).

60. *Id.* at 264 (majority opinion).

that disturbed an individual’s ability to use and enjoy her land had “taken” an easement thereto.⁶¹ Surely, this holding—in a Fifth Amendment context—does not cut to the roots of the issue presented here: that is, whether Congress exceeds the bounds of its *commerce power* when regulating the use of non-navigable airspace within the “immediate reaches of the enveloping atmosphere.”⁶² Nor could it, considering the issue was not before the *Causby* court. Additionally, the Takings context (in which issues regarding airspace typically arise) differs in fundamental ways from the Commerce Clause context.⁶³

This disjunction does not minimize *Causby*’s relevance to the Commerce Clause questions at issue in this Note. Indeed, Justice Douglas offhandedly addressed the tension between *Causby*’s corporeal Takings issue and its spectral Commerce Clause shadow. Although he did so in dicta, and only to a limited extent, it was to this limited extent that the majority and the dissenters disagreed. The majority found a taking despite the fact that the “path of the glide” was “approved by the Civil Aeronautics Authority,” because “Congress” had not placed this airspace in the public domain by deeming it navigable.⁶⁴ Justice Black, by contrast, understood the ACA and CAA as giving, pursuant to its Commerce power, “the Civil Aeronautics Authority exclusive power to determine what is navigable airspace subject to its exclusive control,” making a taking impossible

61. *Id.* at 266.

62. *Id.* at 264.

63. This Note recognizes a basic incompatibility between the substance of Takings Clause challenges and Commerce Clause challenges. When faced with a Takings challenge, a court asks, in general, whether private property has been taken by a federal, state, or local governmental entity for public use; if so, compensation is due the landowner. *See, e.g., Kelo v. City of New London*, 545 U.S. 469 (2005). By contrast, a Commerce Clause challenge suggests that the federal government has regulated something not in or substantially affecting interstate commerce; if successful, the regulation is considered *ultra vires* and invalid. *See, e.g., United States v. Lopez*, 514 U.S. 549 (1995). When courts find a taking under the Fifth Amendment, therefore, it follows that such finding remains mutually exclusive from consideration of the merits of any alternative Commerce Clause challenge Plaintiff might posit with respect to the validity of a regulation. The source of authority is different, and so the inquiry is likewise different. Nevertheless, principles derived from both categories of constitutional challenges remain helpful in illustrating the regulatory landscape with which this Note grapples.

64. *Causby*, 328 U.S. at 263 (emphasis added) (“If that agency prescribed 83 [sic] feet as the minimum safe altitude, then we would have presented the question of the validity of the *regulation*.” (emphasis added)). This part of the opinion likely constitutes dicta, but, as discussed *infra*, it sowed lasting confusion.

where, as in *Causby*, the flight paths at issue were approved by that agency.⁶⁵ In short, the majority and the dissent found different actors constitutionally responsible for different things, and to different extents.

From this disagreement sprung curiosity as to who “calls the shots” over what quantity of airspace: What powers could Congress delegate to executive agencies? Did control over navigable airspace entail control over non-navigable airspace as well? If so, to what extent? And the (much) later arrival of the Court’s *Lopez* and *Morrison* opinions, which narrow the scope of Congress’s Commerce powers, only muddied the ongoing debate. Of necessity, it seems the *Causby* Court left these questions to future courts and congresses. As will be shown, those operating in *Causby*’s wake have provided conceptually different answers.

C. SPACE AS A DISCRETE DYNAMIC OF REGULATION IN AIRSPACE POST-CAUSBY

Following the *Causby* decision, views on the extent of the federal government’s authority to regulate airspace remained in flux, due in part to the apparent dichotomy between navigable and non-navigable airspace. As the Takings doctrine progressed, differing views emerged as to the significance of this spatial division. One reason for this may be dicta in *Causby* ostensibly linking the bounds of navigable airspace with the bounds of Takings liability.⁶⁶ Indeed, following the decision, Congress replaced the ACA with the Federal Aviation Act, establishing the FAA to further enhance the safe and efficient use of airspace,⁶⁷ and reconfiguring the bounds of navigable airspace to include the space needed for take-off and landing.⁶⁸

There remained, however, the reality that overflights within navigable airspace could not easily be classified as less intrusive *per se* to individuals’ “prerogatives of ownership”—a right that *Causby* expressly recognized,⁶⁹ and which the *coelum*

65. *Id.* at 272 (Black, J., dissenting).

66. *See id.* at 264 (majority opinion) (“If any airspace needed for landing or taking off were included [in the definition of navigable airspace], flights which were so close to the land as to render it uninhabitable would be immune.”).

67. Federal Aviation Act of 1958, Pub. L. No. 85-726, 72 Stat. 731, 731 (1958).

68. *Id.* § 101, 72 Stat. at 739.

69. *See Cahoon, supra* note 23, at 172–73. Even the federal government “conceded[d]” to the *Causby* Court that overflights in the navigable airspace

maxim traditionally protected.⁷⁰ If a plane lopped off the roof of one's house while landing, for instance, no court could find the government immune to Takings liability, no matter how "navigable" Congress made such airspace.⁷¹

In *Braniff Airways v. Nebraska State Board of Equalization and Assessment*, a tax case, the Supreme Court further deemphasized (albeit indirectly) the significance of the barrier between navigable and non-navigable airspace with respect to the protection of this individual interest.⁷² The Court suggested in dicta that federal acts regulating "air commerce" were "not [founded] on national ownership of the navigable air space," but rather the commerce power, and thus that their "breadth covers all *commercial intercourse*."⁷³ This position affirmed widespread federal control of airspace, while placing little import in the spatial distinction between navigable and non-navigable airspace.

A different school of thought arose from the Court of Claims in *Aaron v. United States*.⁷⁴ The *Aaron* court proposed a less flexible Takings standard that rested heavily on the spatial distinction between navigable and non-navigable airspace: namely, that "what may be permissible above [the floor of the navigable airspace] is forbidden below it, unless compensation is paid therefor."⁷⁵ Although this standard strengthened landowners' Takings claims as to flights below the navigable airspace, it obliterated them with respect to overflights within the bounds of navigable airspace.⁷⁶ This view, therefore, treats nav-

which rendered property below uninhabitable "would be a taking," a fact which reinforces the persisting importance of the individual's right to exclude others from her airspace recognized in *Causby*. See 328 U.S. at 264.

70. See TIFFANY, *supra* note 25.

71. Cahoon, *supra* note 23, at 165.

72. See *id.* at 178; see also *Braniff Airways v. Neb. State Bd. of Equal. & Assess.*, 347 U.S. 590, 596 (1954) (stating that *Causby* held that "the owner of land might recover for a taking by national use of navigable air space, resulting in destruction in whole or in part of the usefulness of the land property").

73. *Braniff Airways*, 347 U.S. at 596-97.

74. 311 F.2d 798, 801 (1963) (affirming the Trial Commissioner's determination that only "owners of property over which planes flew [beneath the boundary separating navigable from non-navigable airspace] were entitled to compensation").

75. *Id.*

76. The same Court qualified this rule somewhat in *Branning v. United States*, when it held that a taking "is not precluded merely because the flights of Government aircraft are in what Congress has declared to be navigable airspace and subject to its regulation." 654 F.2d 88, 99 (1981) (per curiam). But in general, a plaintiff will encounter more difficulty before a court applying *Aa-*

igable and non-navigable airspace as separate spheres of influence, the former “belonging” to the federal government, and the latter “belonging” to individuals. The federal government becomes an intruder when it reaches beneath the barrier fencing it in.

Both the *Braniff* and *Aaron* views recognize, at least impliedly, that airspace remains “subject to pervasive governmental control.”⁷⁷ But the latter seems to consider this control *less* pervasive, at least in non-navigable airspace, than the former does. Where the former condones sweeping federal regulation, the latter condemns it. The precedents apply concurrently, but imply differing theories of who controls what airspace. And the federal government, though omnipresent in the history of airspace regulation, is not alone in its regulatory efforts. States, too, play an active role in steering the development of airspace regulation. Moreover, managing the possible impact of technological innovations like UAS seems to fall squarely within their spheres of influence.

D. AIRSPACE AND STATE POLICE POWER

While the federal government grappled with uncertainties regarding the constitutional extent of its regulatory presence in national airspace at the dawn of the twentieth century, states and municipalities fought a two-front war.⁷⁸ On one front, states sought to shield localized airspace regulations from federal preemption, a problem that would magnify in coordination with the volume of federal regulation.⁷⁹ On the other, they sought to impose land use limitations on communities.⁸⁰ The rise of Euclidian zoning in the 1920s⁸¹ saw states and munic-

ron's standard.

77. *Air Pegasus of D.C., Inc. v. United States*, 60 Fed. Cl. 448, 453 (2004).

78. See BANNER, *supra* note 25, at 30 (“Aviators and lawyers were, of course, the primary participants in the . . . debate, but they weren’t the only ones. The ownership of space was of interest to all sorts of people for all sorts of reasons, whether or not they intended to take to the air themselves.”). See *generally id.* at 4–42 (discussing the evolution of aviation and the ownership of airspace).

79. See *Braniff Airways v. Neb. State Bd. of Equal. & Assess.*, 347 U.S. 590, 595 & n.11 (1954) (“[T]he states did not consider their sovereignty affected by the [ACA] except to the extent that the states had ceded that sovereignty by constitutional grant.”).

80. See *generally* *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 365 (1926) (upholding an Ohio village council’s zoning ordinance as a valid exercise of authority).

81. See *id.*

palities frequently utilize police power to regulate the manner in which individuals use property, despite the onerous repercussions this practice sometimes wreaked on landowners.⁸²

Among the many considerations involved in local land use regulations are the desired uses (or undesirable misuses) of airspace.⁸³ Height restrictions consistent with legitimate governmental interests in “light, air and aesthetics,” among other things, are constitutionally permitted and frequently enacted.⁸⁴ Pursuant to local interests in suppressing nuisance, a function of local police power, municipalities also assume substantial responsibility for siting airports in a manner that ensures respect for individual interests in airspace.⁸⁵ Technological innovations involving the use of airspace—such as crop dusters and up-scale wind turbines—similarly implicate local interests in health, safety, and the general welfare.⁸⁶ As such, these developments regularly necessitate legislative action from state and municipal authorities, and issues arising from their use are evaluated predominantly under standards arising from state or local law,⁸⁷ though not exclusively.⁸⁸ This local regulatory

82. See *Hadacheck v. Sebastian*, 239 U.S. 394, 414 (1915) (refusing to find a taking where state regulation was a valid exercise of its police power, despite harsh effects on the plaintiff’s brickmaking business); *Mugler v. Kansas*, 123 U.S. 623, 662 (1887) (“[I]f a state deems the absolute prohibition of the manufacture and sale [of liquor] within her limits . . . to be necessary to the peace and security of society, the courts cannot, without usurping legislative functions, override the will of the people . . .”).

83. See WRIGHT, *supra* note 25, at 385.

84. See *id.*; see also, e.g., N.C. GEN. STAT. § 160A-381 (1923).

85. See *Griggs v. County of Allegheny*, 369 U.S. 84, 89 (1962) (holding a county liable for a taking in its capacity as “promoter, owner, and lessor of the [subject] airport” despite substantial federal oversight and grants made there-to pursuant to a federal “National Airport Plan”); *Thornburg v. Port of Portland*, 376 P.2d 100 (Or. 1962) (en banc) (same); *Kellington & Berger*, *supra* note 9, at 7. See generally E. Tazewell Ellett, *The National Air Transportation System: Design by City Hall?*, 53 J. AIR L. & COM. 1, 1–3 (1987) (discussing local government interests in minimizing liability for airport-related nuisance).

86. E.g., N.C. GEN. STAT. ANN. § 143-215.117 (West 2013); OKLA. STAT. ANN. tit. 17, § 160.12 (West 2014) (proposed legislation).

87. Compare *Wilson v. Greg Williams Farm, Inc.*, 436 S.W.3d 485, 488 (Ark. 2014) (finding low-altitude application of pesticides not to be an inherently dangerous activity under state law), with *Yancey v. Watkins*, 708 S.E.2d 539, 544 (Ga. Ct. App. 2011) (finding low-altitude application of pesticides an inherently dangerous activity under state law).

88. See Michael J. Holland, *Federalism in the Twenty-First Century: Preemption in the Field of Air*, 78 DEF. COUNS. J. 11, 11 (2011) (“Courts have increasingly looked to federal law to determine liability and standard of care for such issues as in-flight air operations, pilot training and air space management, but they have been more reluctant to hold that federal law preempts

framework, thus illustrated, reflects the reality that federal interests in the national airspace intersect with states' and municipalities' interests in protecting persons and property in their jurisdictions, promoting beneficial use of natural resources, and compensating victims of negligent or harmful conduct in overlying airspace.

As illustrated, states and municipalities take an active role in shaping and defining the rights individuals enjoy in airspace, and they do so with their police power. Federal legislation, however, can dilute these efforts, and the resulting tension resulting therefrom simmers indefinitely, unaddressed and unresolved. With commercial UAS use, conflicting interests and authority threaten to boil this conflict over. That the current regulatory framework serves federal, state, municipal, and individual interests imperfectly seems evident. Only after untangling the relevant considerations may a solution to this puzzle present itself.

II. TURBULENCE: RECONCILING HISTORY, DOCTRINE, AND EXPERIENCE

As the history shows, airspace regulation is a forum where divergent (and sometimes complementary) interests collide. The players are established, but the balance and allocation of power among them is shifting. The authority for action at each level is stated plainly, but its precise mechanism varies drastically depending on the circumstances and the stakes. Resulting ambiguities and uncertainties cause turbulence for developing industries—here, the UAS industry—and those seeking to unlock their potential. Section A parses the *Pirker* decisions introduced at the beginning of this Note, and their implications as a tableau of the modern regulatory landscape. Section B then evaluates in greater detail the grounds for federal regulation of UAS under the Commerce Clause. Finally, Section C assesses the objects and consequences of current statutes and regulatory efforts bearing on UAS operations.

A. *HUERTA V. PIRKER* AND THE FMRA: THE MODERN REGULATORY LANDSCAPE

Recall Raphael Pirker, who was fined \$10,000 for flying a five-pound Styrofoam plane, equipped with a camera, over the

state law in such areas as product manufacturing defects, failure to warn and on-ground aviation accidents.”).

University of Virginia.⁸⁹ When the FAA first brought him before the National Transportation Safety Board (NTSB),⁹⁰ Pirker’s central argument was that his Styrofoam model airplane qualified as a “model aircraft,” and that the FAA had no authority to regulate the use of model aircraft for any purpose.⁹¹ He rested this argument on the FAA’s 1981 Advisory Circular, which “encourage[d] voluntary compliance” with enumerated safety standards, despite the “hazard” they might pose to “full-scale aircraft in flight and to persons and property on the surface.”⁹² This Circular, which preceded the FMRA and was thus instructive at the time, did not prohibit commercial use of model aircraft.⁹³

The FAA responded with a three-step argument: (1) that Pirker’s flight was “for compensation”;⁹⁴ (2) that, in light of this compensation, his alleged “model aircraft” was in fact *not* a model aircraft, but a UAS “aircraft” falling squarely within the FAA’s purview;⁹⁵ and (3) that “as a consequence,”⁹⁶ his flight recklessly endangered the life and property of others in violation of federal regulations.⁹⁷ In essence, the FAA sought to assert regulatory control over what would otherwise be a model aircraft because it was flown for commercial purposes, an argument never before made.

89. See Pirker, Docket No. CP-217, 2014 WL 3388631, at *1–2 (N.T.S.B. Mar. 6, 2014).

90. *Id.* As discussed above, the FAA fined Pirker \$10,000 for flying a Styrofoam plane over the University of Virginia; the subsequent challenge is discussed *infra*.

91. See Pirker, 2014 WL 3388631, at *2.

92. ADVISORY CIRCULAR, FAA DOC. 91-57 (June 9, 1981) (requesting that “[m]odelers . . . [1] [s]elect an operating site that is of sufficient distance from populated areas . . . [2] not operate model aircraft in the presence of spectators until . . . flight tested and proven airworthy . . . [3] not fly model aircraft higher than 400 feet above the surface” and “[4] [g]ive right of way to, and avoid flying in the proximity of, full-scale aircraft”).

93. See *id.*

94. Pirker, 2014 WL 3388631, at *2.

95. *Id.* See generally Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. 6689, 6690 (Feb. 13, 2007) (codified at 14 C.F.R. pt. 91) (requiring “specific authority” to operate UAS in the “National Airspace System,” and distinguishing between (1) “UAS operating as public aircraft”; (2) “UAS operating as civil aircraft”; and (3) “model aircraft [for which] the authority is AC 91–57”).

96. Pirker, 2014 WL 3388631, at *2.

97. See Careless or Reckless Operation, 14 C.F.R. § 91.13 (2015) (“No person may operate an *aircraft* in a careless or reckless manner so as to endanger the life or property of another.” (emphasis added)); see also *id.* § 1.1 (“*Aircraft* means a device . . . used for flight in the air.”).

In a controversial opinion, Judge Geraghty dismissed the FAA's complaint and found that the "[m]odel aircraft operation by [Pirker was] subject only to the FAA's requested voluntary compliance with the Safety Guidelines stated in AC 91-57," and that "model aircraft" did not qualify as "aircraft" for the purposes of 14 C.F.R. § 91.13.⁹⁸ In their excitement, UAS enthusiasts failed to take adequate note of Judge Geraghty's more loaded final finding: "[s]pecifically, that *at the time of [Pirker's] model aircraft operation . . . there was no enforceable FAA rule . . . applicable to model aircraft or for classifying model aircraft as an UAS.*"⁹⁹

On appeal, the NTSB narrowly reversed Judge Geraghty's determination that the FAA could not prosecute reckless operation of "model aircraft," but its decision on appeal merely reflected rules *already codified* in the FMRA.¹⁰⁰ Indeed, after Judge Geraghty rendered his original decision, the FAA requested that the FMRA's definition of model aircraft supersede the AC 91-57's voluntary guidelines for precisely this reason.¹⁰¹ The FMRA unambiguously defines "model aircraft" and exempts them from regulation insofar as they do not endanger the national airspace system;¹⁰² a UAS operated for commercial purposes (that is, purposes that are neither hobbyist nor recreational) does not qualify as a "model aircraft."¹⁰³ Such devices therefore are subject to the FAA's regulations. Because the

98. *Pirker*, 2014 WL 3388631, at *7-8; *see also supra* notes 91-92, 95.

99. *Pirker*, 2014 WL 3388631, at *5 (emphasis added).

100. *See id.* Curiously, in finding for the FAA, the NTSB recognizes that "certain provisions of the [Federal Aviation Regulations] may not be logically applicable to model aircraft *flown for recreational purposes*. But nothing in the text of the document disclaims, implicitly or explicitly, the . . . interest in regulating operations of model aircraft that pose a *safety hazard*." *Id.* (emphasis added). Why a model aircraft should pose an additional, legally relevant safety hazard when converted to a *commercial* use—thereby losing its status as "model aircraft" under the FMRA—goes unaddressed in the opinion.

101. *See Sachs, supra* note 7. The FMRA defines "model aircraft" in relevant part as an aircraft "limited to not more than 55 pounds" and "flown strictly for hobby or recreational use" in accordance with "a community-based set of safety guidelines." FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(a)(1)-(3), 126 Stat. 11, 77 (2012).

102. *See* FAA Modernization and Reform Act § 336.

103. *Id.* Under the FAA's proposed rules, those operating UAS would have to be vetted by the TSA, pass an FAA-approved aeronautical knowledge test every two years, obtain a certificate similar to a pilot airman certificate, and more. *See generally supra* note 16 (listing proposed operational limitations, aircraft requirements, and operator responsibilities pertaining to UAS and those who operate them).

FMRA’s definition currently governs, *Pirker*-esque flights today undoubtedly violate federal law.¹⁰⁴ Whether this state of the law is consistent with the history and purpose of airspace regulation, however, proves the more relevant issue.

B. CAN THE FEDERAL GOVERNMENT HAVE ITS CAKE AND EAT IT TOO?

The FMRA’s prohibition on commercial operation of UAS flows from Congress’s power under the Commerce Clause. Congress did not, however, include a jurisdictional hook in the statutory text,¹⁰⁵ and thus the mechanism of the prohibition remains obscure; the explanation for why the operation of commercial UAS in non-navigable airspace qualifies *per se* as “interstate commerce”¹⁰⁶ does not immediately present itself. It seems uncontroversial to note that some small-scale commercial UAS use does not significantly impact interstate commerce, and no court or congress has explicitly established (on a national scale) that *all* airspace is a channel of commerce, with all activity therein falling within the ambit of Congress’s Commerce power. Of course, this does not establish that Congress *cannot* regulate small-scale UAS activity in non-navigable airspace on these grounds; it merely indicates that such regulatory reach is novel, and therefore requires a justification. As such, Congress would likely assert the following justifications for the prohibition: (1) that commercial UAS are instrumentalities of commerce; (2) that all commercial UAS use substantially affects interstate commerce *per se*; or (3) that non-navigable airspace, like navigable airspace, is a channel of commerce.¹⁰⁷

An argument that commercial UAS are instrumentalities of commerce ignores contradictory precedent. In *United States*

104. See FAA Modernization and Reform Act § 336(b); Kellington & Berger, *supra* note 9, at 7 (“Given that in FMRA [sic] Congress says that FAA may enforce its rules against sUAS [small UAS] users, it is logical to assume that Congress meant FAA’s rules to be applied to sUAS users as well. . . . Therefore, the [original] *Pirker* decision may have little bearing on the operations of sUAS in a post FMRA world.”).

105. The Supreme Court has found Congress’s decision to exclude a “jurisdictional element” in a statute—for instance, “in or affecting interstate commerce”—as persuasive evidence that the statute falls outside the scope of Congress’s power under the Commerce Clause. *United States v. Lopez*, 514 U.S. 549, 561 (1995) (“[The statute] contains no jurisdictional element which would ensure, through case-by-case inquiry, that the firearm possession in question affects interstate commerce.” (emphasis added)).

106. *Id.* at 554.

107. See *id.* at 558–59.

v. Lopez, the Supreme Court struck down a federal law prohibiting the carrying of a firearm in a school zone; that firearms *in themselves* are commodities bought, sold, and carried in interstate commerce did not constitute a persuasive defense of the statute.¹⁰⁸ The FMRA similarly prohibits commercial UAS activity, *not* the “interstate transportation of a commodity,” and as such cannot be said to regulate instrumentalities of interstate commerce.¹⁰⁹

An alternative argument that all commercial UAS use substantially affects interstate commerce *per se*, though somewhat more persuasive than the latter argument, likewise proves an insufficient defense of the FMRA. Although commercial operation of UAS plainly seems an economic activity—unlike carrying a firearm,¹¹⁰ possessing marijuana,¹¹¹ or gender-motivated violence¹¹²—and some uses are easily classified as serving “truly national” purposes,¹¹³ the technology can certainly be (and *has certainly been*) adapted to serve “truly local” purposes as well.¹¹⁴ Without a jurisdictional element,¹¹⁵ which would “ensure[] through case-by-case inquiry” that even small-scale commercial UAS use substantially affects interstate commerce, defending the FMRA’s constitutionality on these grounds would prove difficult.¹¹⁶

The most contentious inquiry is whether non-navigable airspace qualifies as a channel of commerce. Since the inception of airspace regulation, navigable airspace was established for the purpose of facilitating interstate air commerce.¹¹⁷ The CAA

108. *Id.* at 559.

109. *See id.*

110. *See id.*

111. *See Gonzales v. Raich*, 545 U.S. 1, 20 (2005).

112. *See United States v. Morrison*, 529 U.S. 598, 598 (2000) (“[G]ender-motivated crimes of violence are not, in any sense, economic activity.”).

113. *Id.* at 599; *see, e.g.*, AMAZON PRIME AIR, <http://www.amazon.com/b?node=8037720011> (last visited Oct. 15, 2015).

114. *See Morrison*, 529 U.S. at 599; *see also Drones Hit Roadblock on Path To Become Farming Tool*, FARMING DRONES (July 27, 2014), <http://farmingdrones.com/drones-hit-roadblock-on-path-to-become-farming-tool-business>.

115. *But see Perez v. United States*, 402 U.S. 146, 154 (“Where the *class of activities* is regulated and that *class* is within the reach of federal power, the courts have no power ‘to excise, as trivial, individual instances’ of the class.” (quoting *Maryland v. Wirtz*, 392 U.S. 183, 193 (1968))).

116. *See United States v. Lopez*, 514 U.S. 549, 561 (1995).

117. *See Air Commerce Act of 1926*, Pub. L. No. 69-251, ch. 344, § 9(c), 44 Stat. 568, 574 (“[‘C]ivil airway’ means a route in the *navigable* airspace designated . . . as a route suitable for interstate or foreign air commerce.” (emphasis added)).

granted a “public right of freedom of transit”¹¹⁸ in the navigable airspace and delegated to the Administrator of Civil Aeronautics the power to establish civil airways for the purposes of interstate air commerce within that airspace.¹¹⁹ Although “navigable airspace” is merely airspace “above the minimum altitudes of flight,” the very distinction between “air commerce” and “interstate . . . or foreign air commerce” implies an understanding that the navigable airspace would be a channel of interstate commerce.¹²⁰ Regulation thereof naturally fell within the ambit of congressional power under the Commerce Clause.

As Justice Black contended in his *Causby* dissent, however, Congress’s authority over navigable airspace, like its authority over navigable waters, is “plenary.”¹²¹ Cases preceding *Causby* found ample support for broad congressional authority over navigable waters “as broad as the needs of commerce,” and not limited merely to “control for navigation.”¹²² In *Kaiser Aetna v. United States*, Justice Rehnquist remarked that “[r]eference to . . . navigability . . . adds little if anything to the breadth of Congress’ regulatory power over interstate commerce,” and that such regulatory power must be understood “in terms of more traditional Commerce Clause analysis than by reference to [navigability].”¹²³ By analogy, one might suggest that non-navigable airspace, if a host to “air commerce,”¹²⁴ should qualify as a channel of commerce.¹²⁵

In light of the statutory history of airspace regulation, however, this conclusion stretches too far. Only *navigable* airspace was thought a venue for *interstate* commerce, and such airspace is unambiguously identifiable, unlike certain bodies of water, which may or may not be navigable.¹²⁶ There exists no

118. Civil Aeronautics Act of 1938, Pub. L. No. 75-706, § 3, 52 Stat. 973, 980 (1938).

119. *Id.* § 301.

120. *Id.* §§ 1(3), (16), (20), (24).

121. *See* *United States v. Causby*, 328 U.S. 256, 272 (Black, J., dissenting).

122. *United States v. Appalachian Elec. Power Co.*, 311 U.S. 377, 426 (1940).

123. *Kaiser Aetna v. United States*, 444 U.S. 164, 173–74 (1979).

124. *See, e.g.*, Air Commerce Act of 1926, Pub. L. No. 69-251, ch. 344, 44 Stat. 568, 568 (1926).

125. *See* *United States v. Ballinger*, 395 F.3d 1218, 1226 (11th Cir. 2005) (identifying “airspace” as a channel of commerce).

126. *See, e.g.*, *PPL Mont., L.L.C. v. Montana*, 132 S. Ct. 1215, 1228 (2012) (“*The Daniel Ball* [“navigability in fact”] formulation has been invoked in considering the navigability of waters for purposes of assessing federal regulatory

dispute as to what constitutes navigable and non-navigable airspace because the distinction is clearly delineated, and the quality that makes airspace navigable (altitude) is a definite and inalienable characteristic of the spatial corridor to which it belongs. For this reason, the scope of federal power over water may extend further than it does over airspace by virtue of the indefinite qualities that make water navigable, and the resulting need for more expansive legislative reach. At the very least, the government could therefore argue that the proximity of activities within non-navigable airspace to those within navigable airspace, and the risk that reckless operation of UAS in non-navigable airspace could pose a danger to interstate commerce in navigable airspace, might permit coordinate regulation of *all* airspace. In other words, although non-navigable airspace is not a channel of commerce, collateral regulation of non-navigable airspace, undergone to protect the integrity of *navigable* airspace, is permitted under Congress's commerce power.

If this is the case, then the regulatory framework currently in place is riddled with inconsistencies. On the one hand, the FAA's AC 91-57, as interpreted by the FAA, prohibits operation of UAS absent a certificate of authorization,¹²⁷ and obtaining a certificate of authorization has proven immensely complex and difficult.¹²⁸ That the NTSB vacillated in recognizing any binding authority to reinforce the FAA's *safety* argument, without even considering the incipient commerce issues on the table, complicates this development.¹²⁹ On the other hand, the FMRA reserves for the FAA Administrator the power "to pursue enforcement action against persons operating model aircraft who endanger the safety of the national airspace system," but it *denies* the administrator the power to promulgate any *other* rules regarding model aircraft flown for hobby or recreational purposes.¹³⁰ Why should a model aircraft, at first subject only to a generalized safety requirement, suddenly become subject to an

authority under the Constitution, and the application of specific federal statutes, as to the waters and their beds.").

127. Unmanned Aircraft Operations in the National Airspace System, 72 Fed. Reg. 6689, 6690 (Feb. 13, 2007) (codified at 14 C.F.R. pt. 91). Under the proposed rules, this requirement would not be as stringent, although a similar requirement would apply. *See supra* note 103.

128. *See, e.g.*, *Astraeus Aerial*, Docket No. FAA-2014-0352 (FAA Sept. 25, 2014).

129. *See supra* Part II.A.

130. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(b), 126 Stat. 11, 77 (2012).

expansive system of regulation when its owner converts it to a commercial use? The implicit distinction here between hobbyist and commercial uses seems arbitrary in light of the identical safety risks posed by both commercial UAS and model aircraft. To wit, there is no clear reason why commercial UAS in non-navigable airspace pose more danger to airspace as a channel of commerce than hobbyist model aircraft.

The FMRA’s “model aircraft” exemption demonstrates, by its own terms, that low altitude, small-scale commercial UAS use poses little, if any, additional danger to persons or property on the ground than do “model aircraft.” The FAA’s safety concerns, though not resolved by the FMRA, are *addressed* in the FMRA’s definition of “model aircraft,” which demands operation of a small UAS (that is, less than 55 pounds) “in accordance with a community-based set of safety guidelines”¹³¹ in “a manner that does not interfere with and gives way to any manned aircraft,”¹³² and which involves communication with airport operators when in close proximity to airports.¹³³ When operated in accordance with these standards, the UAS is *already* immune to regulation; if an operator ignores these standards, then she stands vulnerable to prosecution by the FAA.¹³⁴ That commercial UAS operators would need to comply with these safety requirements as well detracts significantly from arguments that suggest such use is *inherently* more dangerous than “model aircraft” use as currently defined. Without a more compelling distinction between the risks and capacities of commercial UAS versus model aircraft, the government’s authority to comprehensively regulate either diminishes.

C. COMPETING VALUES: OVERLYING IMPERFECTION VERSUS UNDERLYING PERFECTION

As it stands, non-navigable airspace likely does not *in itself* qualify as a channel of commerce. But this would not stand in the way of regulations promulgated for the purpose of protecting the *navigable* airspace, which *is* a channel of commerce. Whether this reasoning vindicates the FMRA’s prohibition on commercial UAS may therefore depend on the significance given the spatial distinction between navigable and non-navigable

131. *Id.* § 336(a)(2).

132. *Id.* § 336(a)(4).

133. *Id.* § 336(a)(5).

134. Rafael Pirker’s case seems an apt example in this respect. *See id.*; *see also supra* Part II.A.

airspace. Under the *Braniff* view,¹³⁵ the individual's right to use airspace exists "subject to the dominant servitude in the United States to regulate commerce in the air."¹³⁶ This view permits a great degree of federal intrusion into otherwise private airspace, so long as the intrusion may be tied to commercial intercourse. The *Aaron* view, however, which presumes a taking when the federal government so intrudes, stands for the proposition that such intrusions require compensation, even if grounded on constitutional powers.¹³⁷ The prime difference between these views rests on their regard for individuals' substantive rights in airspace.

Although one might contend that the *Braniff* is most consistent with the Supreme Court's Commerce Clause doctrine, one might contend with equal force that the *Aaron* view is most consistent with the structure of federalism among the governmental entities that comprise the United States. Because *Aaron* sets a concrete hurdle in the path of the federal regulations of non-navigable airspace, it deters sweeping federal regulation and allows *states* more leeway to shape and define individual rights to utilize non-navigable airspace. *Braniff*, by contrast, may encourage sweeping federal regulation affecting non-navigable airspace, which, although likely permissible under the Commerce Clause, may phase out *states*' influence on the rights enjoyed therein.

Because FAA regulations and the FMRA substantially circumscribe *all* commercial UAS use, regardless of whether it affects interstate commerce, it seems commonsense to suggest that they both shape and define individual property rights in non-navigable airspace. The implication of these substantive rights is more immediately acceptable under the *Braniff* vision of airspace than under *Aaron*'s vision. Nevertheless, *Aaron*'s vision may be more consistent with the Supreme Court's substantive rights doctrine. In *United States v. Windsor*, the Supreme Court indicated that the Federal Government's prerogative to regulate diminishes when such regulations negatively implicate rights traditionally within the purview of state regulation.¹³⁸ Although *Windsor* spoke to marriage rights—long

135. See generally *supra* Part I.C.

136. *Bydlon v. United States*, 146 Ct. Cl. 764, 770 (1959) (expounding upon *Braniff*'s outline of federal power); see also *supra* Part I.D.

137. See *supra* Part I.D.

138. See *United States v. Windsor*, 133 S. Ct. 2675, 2691 (2013) ("[T]he Federal Government, through our history, has deferred to state-law policy de-

recognized as fundamental,¹³⁹ unlike economic property rights in airspace¹⁴⁰—history demonstrates that states have long shaped and defined individual rights in airspace.¹⁴¹

Although one might note that federal laws and applicable doctrine *by definition* shape and define individual rights in airspace, the same laws and doctrines also defer substantially to individual rights in airspace, as well as state prerogatives to shape and define these rights. The Court in *Causby* abrogated the *ad coelum* doctrine and substantially reduced individual claims to overlying airspace, but it also reaffirmed individual property rights in airspace within the “immediate reaches of the enveloping atmosphere,” and it confirmed that airspace was capable of appropriation, as understood and recognized since Roman times as a common law precept.¹⁴² Further, the ACA permitted states to “set apart and provide for the protection of necessary airspace reservations in addition to and not in conflict either with airspace reservations established by the President . . . or with any civil or military airway” established pursuant to the Act, which suggests congressional deference to a greater degree of state influence below the navigable airspace.¹⁴³ Such deference is not novel when privately owned property interests are at stake.¹⁴⁴ That variable state standards (with regards to trespass, nuisance, and other doctrines that similarly implicate individuals’ substantive rights in air-

cisions with respect to domestic relations.”).

139. See generally, e.g., *Loving v. Virginia*, 388 U.S. 1 (1967) (invalidating all anti-miscegenation laws).

140. See generally *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978) (noting Penn Central’s rights to the airspace above its property yet not finding city’s restrictions on uses of this airspace to be a compensable taking).

141. See *supra* Parts I.A, D.

142. *United States v. Causby*, 328 U.S. 256, 264 (1946).

143. See Air Commerce Act of 1926, 41 Pub. L. 568, ch. 344, 44 Stat. 568, 570 (1926).

144. Consider, for instance, the fact that most zoning codes have prohibited (in varying degrees) commercial activity in residential areas for nearly a century. E.g., Nicole Stelle Garnett, *On Castles and Commerce: Zoning Law and the Home-Business Dilemma*, 42 WM. & MARY L. REV. 1191, 1194–95 (2001) (“[I]ndividuals who want to work at home face significant legal obstacles, especially municipal zoning laws that severely restrict the operation of home businesses when they do not prohibit them outright.”); see also *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 365, 392 (1926) (“The segregation of industries, commercial pursuits, and dwellings to particular districts in a city, when exercised reasonably, may bear a rational relation to the health, morals, safety, and general welfare of the community.”).

space) remain virtually untouched by federal airspace regulations suggests, as in *Windsor*, that states' prerogatives in the realm of non-navigable airspace remain substantial.¹⁴⁵

This analysis does not question the FMRA's constitutionality. On the contrary, the Commerce Clause almost certainly gives Congress the power to regulate non-navigable airspace in a manner that secures the safety of the navigable airspace.¹⁴⁶ But in mandating federal approval of all commercial UAS in non-navigable airspace, the federal government usurps state prerogatives in the sky, and limits states' capacity to shape and define the manner in which the commercial UAS industry develops in their respective jurisdictions. The very prospect that federal laws of this sort would subordinate state influence in airspace compelled the ACA's distinction between navigable and non-navigable airspace in the first place.¹⁴⁷

In addition, the FMRA's ban on commercial UAS carries potentially dire ramifications under existing Takings doctrine. Under *Braniff* and *Aaron*, the existence of congressional authority to regulate remains nearly as certain as the determination of federal liability for intrusions in non-navigable airspace. If, for instance, the federal government passes a regulation permitting intrusion into non-navigable airspace using the Commerce Clause, the regulation is legitimate under *Braniff*, but likely a taking under *Aaron*.¹⁴⁸ In the context of commercial UAS regulation in non-navigable airspace, this analysis could

145. See, e.g., *supra* notes 86–88 and accompanying text; see also *Abdullah v. Am. Airlines, Inc.*, 181 F.3d 363, 375 (3d Cir. 1999) (“Even though we have found federal preemption of the standards of aviation safety, we still conclude that the traditional state and territorial law remedies continue to exist for violation of those standards. Federal preemption of the standards of care can co-exist with state and territorial tort remedies.”).

146. See, e.g., *Heart of Atlanta Motel, Inc. v. United States*, 379 U.S. 241, 256 (1964) (recognizing congressional power under the Commerce Clause “to keep the channels of interstate commerce free from immoral and injurious uses”); cf. *United States v. Appalachian Elec. Power Co.*, 311 U.S. 377, 426 (1940) (“[A]uthority [to regulate navigable waters] is as broad as the needs of commerce. Water power development from dams in navigable streams is from the public's standpoint a by-product of the general use of the rivers for commerce.”).

147. See *supra* note 48.

148. Whether the regulation would require compensation remains uncertain. The *Aaron* court faced a *physical*, rather than regulatory, intrusion. See *supra* notes 74–76. Its language suggests, however, that regulatory intrusion may be equally problematic. See *Aaron v. United States*, 311 F.2d 798, 801 (1963) (suggesting that courts consider “whether the relevant *statutes and regulations* [permitting damage to private property interests] violated the property owner's constitutional rights” (emphasis added)).

support a finding that the FMRA works an unprecedentedly massive taking, because even commercial UAS activity that *does not* affect interstate commerce and which *does not* occur in a channel of commerce is essentially prohibited, at least until the FAA's regulations are implemented permanently.¹⁴⁹ Individuals who acquired property with the understanding that they could use inexpensive technology such as UAS to assist their small-scale enterprises, and who cannot otherwise utilize their airspace in a manner that is commercially feasible, may have a colorable constitutional claim against the federal government. This will ring especially true when the value of the airspace is distinguishable from the parcel's value, as is sometimes the case with wind estates.¹⁵⁰ In one sense, such a taking is tantamount to pre-ACA suggestions that the federal government simply use its power of eminent domain to acquire all airspace.¹⁵¹

Though the latter statements may raise some eyebrows, the possible constitutional claims to which this Note refers remain fully distinguishable from ostensibly adverse Supreme Court precedent. For instance, one likely counterargument,

149. This formulation remains simplistic in several respects, but not altogether unlikely. One could object that a taking in this context is unlikely because, like development moratoria, the ban is temporary. *Cf.* *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302, 323 (2002) (refusing to find that temporary regulatory moratoria effect a *per se* taking on affected landowners). Further, the Supreme Court has previously refused to enjoin government action "forbid[ding] the private use of certain airspace." *Id.* (citing *Penn Cent. Transp. Co. v. New York City*, 438 U.S. 104 (1978)). Unless the regulation reduces an *entire parcel's* property value markedly, one might say, such regulation would not require compensation as a taking. *See Penn Cent.*, 438 U.S. at 131.

These objections, while formidable, are surmountable. Indeed, the temporary prohibition on commercial UAS use is but a placeholder for onerous future burdens on all such use currently in the making, and imposed by the federal government. *See supra* note 16. Moreover, sweeping impediments to commercial use of *all* private airspace are far more difficult to justify than limitations on the use of "certain" private airspace, as was the case in *Penn Central. Tahoe-Sierra*, 535 U.S. at 302. Because all government actions, in this respect, must at least be rational, *see Penn Cent.*, 438 U.S. at 131, this difference in scope remains highly relevant to any Takings inquiry. As Troy Rule points out, scholars and courts have recently proved more amenable than not to the argument that airspace is a natural resource, and that damage to interests therein may constitute a complete loss. *See* Troy A. Rule, *Airspace and the Takings Clause*, 90 WASH. U. L. REV. 421, 465 & nn.205–10 (2012). If, therefore, the federal government's regulatory authority is found constitutional, its exercise thereof may require more money than it is prepared to deliver.

150. *See* Rule, *supra* note 149.

151. *See* BANNER, *supra* note 25, at 99–100.

enunciated in *Andrus v. Allard*, is that depriving property of its most profitable use does not and *should* not necessarily constitute a governmental taking.¹⁵² In *Allard*, however, Congressional authority to regulate the property at issue (eagle feathers) in the manner at issue (taking, selling, and purchasing) was plainly reasonable. A conspicuous absence of dissenters in the case, coupled with the commonsense observation that permitting the sale of pre-Eagle Protection Act feathers—often indistinguishable from post-Eagle Protection Act feathers—would facilitate circumvention of the law, validate this statement.¹⁵³ Airspace, by contrast, is murkier property insofar as its value is more difficult to quantify, and the sense in subjecting it to comprehensive regulation seems dubious at best.¹⁵⁴ The scope of the FAA's regulations, both present and future, remains difficult to justify under the Court's recent Commerce Clause decisions. Even when juxtaposed with the Court's *Penn Central* case, which refused to find a regulatory taking of airspace, the Court only considered the legitimacy of *local* law in a narrowly confined airspace arena.¹⁵⁵ In short, this author was unable to discern any Supreme Court precedent precluding a successful Takings claim against the government in this context.¹⁵⁶

Taken alongside concerns regarding the FMRA's impact on states' prerogative to regulate airspace, the current state of the law contravenes prominent federalist policies and concerns spanning the entire development of airspace regulation, and may impose nearly insurmountable administrative burdens on the federal government with regards to Takings liability.¹⁵⁷ Everybody loses. In truth, though, this problem is the child of uncertainty as to the balance of power between states and the federal government, as well as the reach of federal authority in

152. See *Andrus v. Allard*, 444 U.S. 51 (1979).

153. See *id.* at 58.

154. See *supra* Part II.B (“[T]here is no clear reason why commercial UAS in non-navigable airspace pose more danger to airspace as a channel of commerce than hobbyist model aircraft.”).

155. See *supra* note 149. Indeed, this Note, like the Supreme Court, does not take issue with local laws of the sort at issue in *Penn Central*; it is *federal* action that remains concerning.

156. Other adverse precedent addressing inverse condemnation, like *Allard* and *Penn Central*, is readily distinguishable. See, e.g., *Hadacheck v. Sebastian*, 239 U.S. 394 (1915) (upholding a *local* ordinance precluding brickmaking because it regulated an *easily identifiable* nuisance).

157. See *generally supra* Part I.B (discussing early congressional efforts to harness airspace, and noting that Congress elected *not* to use its war powers in asserting regulatory authority therein).

airspace under the Commerce Clause. Dispelling the uncertainty will diminish its attendant fallout.

III. DRAIN THE SKY: THE NEED TO DISCARD UNNECESSARY REGULATIONS

The federal government has flooded the sky with regulations, including the FMRA’s effective ban on commercial UAS use. The ban is not technically *absolute*, for an opportunistic individual or organization could seek a certificate of authorization to use UAS below the navigable airspace; the issue is that the FAA only rarely considers issuing such certificates, and when it does, it subjects the certificate holder to exceedingly rigorous standards.¹⁵⁸ Amending the FMRA to include a jurisdictional element would serve to shield not only the FMRA, but the FAA’s future regulatory efforts—and its recently released proposed rules¹⁵⁹—from legal challenge, while providing concrete guidance to both individuals and regulatory actors on what is and is not permitted.¹⁶⁰

The jurisdictional element, the benefits one might expect to flow therefrom, and the hurdles to be overcome in the process are addressed in Section A. Section B then recognizes the practical limitations of amending the FMRA, but responds that greater clarity in the law substantially eliminates open questions as to authority to govern airspace, as well as the extent of an individual’s stake in her overlying airspace, both of which plague the modern regulatory framework. Simply put, including a jurisdictional element in the FMRA would foster growth in the UAS industry by draining the sky of superfluous regulation.

A. *TEMET NOSCE*: A JURISDICTIONAL ELEMENT WILL CLARIFY ROLES AND RIGHTS

The FMRA’s definition of “model aircraft,” a class of aircraft immune from FAA regulation, permits only “hobby or rec-

158. See, e.g., *Astraeus Aerial*, Docket No. FAA-2014-0352 (FAA Sept. 25, 2014); see also Kellington & Berger, *supra* note 9.

159. See *supra* note 103.

160. Of course, this guidance will not cure all. Some commentators have deemed the regulatory process confusing and circular, leading to many dead ends. See Nicholas R. Bednar, Note, *Social Group Semantics: The Evidentiary Requirements of “Particularity” and “Social Distinction” in Pro Se Asylum Adjudications*, 100 MINN. L. REV. 355, 396 (2015); Samuel D. Posnick, Note, *A Merry-Go-Round of Metal and Manipulation: Toward a New Framework for Commodity Exchange Self-Regulation*, 100 MINN. L. REV. 441, 454–60 (2015).

reational use,” implicitly excluding commercial use.¹⁶¹ Seen alongside the FAA’s interpretation of AC 91-57, it seems likely that the law, as it currently stands, is a sweeping bar to commercial UAS use by the great majority of landowners with a stake in productive use of their overlying airspace. Following *Huerta v. Pirker*, however, which indicated that AC 91-57 does not qualify as binding law,¹⁶² still proves treacherous for individuals and businesses. The FAA, after all, continues to issue cease-and-desist letters threatening litigation.¹⁶³ For this reason, there seems a bald need for more clarity in the law as to permissible and impermissible activity, for the sake of individual, corporate, and government entities alike. Subsection 1 proposes a concrete way to achieve this clarity and outlines the manifold benefits to be expected therefrom, while Subsection 2 acknowledges some practical, but manageable, difficulties that may complicate progressive efforts.

1. Amending the FMRA

Amending a jurisdictional element into the FMRA’s definition of “model aircraft”—that is, changing “the aircraft is flown strictly for hobby or recreational use”¹⁶⁴ to “the aircraft is flown for hobby, recreational, or other use not in or affecting commerce”—would considerably help alleviate this confusion. Such an amendment would confine the scope of the Act, and subsequent regulations, to either activities in the navigable airspace *or* to activities in non-navigable airspace which *in fact* affect interstate commerce. The resulting benefits would be three-fold: (1) promoting clarity in the law and narrowing the regulatory role of the FAA; (2) defining and reinforcing individuals’ legitimate interests in airspace; and (3) carving out an area of influence for state and municipal entities with an interest in guiding the use and development of UAS in their respective jurisdictions.

As written, the FMRA perpetuates a flawed theory of federal regulatory power. Non-navigable airspace is not a channel of commerce, despite its proximity to navigable airspace. Supreme Court doctrine thus requires that the object of regulation

161. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(a)(1), 126 Stat. 11, 77 (2012).

162. *See supra* Part II.A.

163. *See supra* note 10.

164. *See* FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336(a)(1).

either qualifies as an instrument of commerce or an activity that substantially affects interstate commerce.¹⁶⁵ Because the FMRA does not regulate an instrumentality of commerce, the only theory that justifies its effective ban considers *all* commercial UAS operation below non-navigable airspace to affect interstate commerce, a dubious prospect at best. So long as the FAA asserts regulatory authority over all commercial activities in airspace, the regulatory framework's conformity with Supreme Court doctrine will remain vulnerable to challenge, and *Pirker* leaves reason to believe that the federal government may well lose its interpretive battle in the courts.

The Court in *Lopez* struck down the Gun-Free School Zones Act due, in part, to the fact that it lacked a jurisdictional element. It said that without a jurisdictional element "which might limit [the Act's] reach to a discrete set of firearm possessions that *additionally* have an explicit connection with or effect on interstate commerce," the statute prohibited activity without a tie to interstate commerce, and thus exceeded Congress's power under the Commerce Clause.¹⁶⁶ Although commercial drone activity, unlike firearm possession, plainly seems commercial, many commercial UAS uses would not have a "substantial effect . . . visible to the naked eye" on interstate commerce.¹⁶⁷ Tweaking the FMRA's definition of "model aircraft" to include commercial activity not in or affecting interstate commerce would sidestep this issue and handily confine congressional authority, and FAA regulatory authority, to constitutionally enumerated criteria. Not only would this insulate the FMRA from constitutional attack, but it would also narrow the FAA's regulatory role in a manner that simplifies enforcement of existing law, thereby conserving valuable government resources rather than wasting them on frivolous cease-and-desist letters and elaborate administrative battles.

States, municipalities, and individuals would reap a massive benefit from such an amendment as well. Those who are eager to utilize commercial UAS on a small scale would be able to take definitive steps towards incorporating UAS into their business practices. This is particularly significant to the emerging precision farming practice, for which UAS are an inexpensive substitute to costly alternatives.¹⁶⁸ States which suffer

165. See *supra* Part II.B.

166. *United States v. Lopez*, 514 U.S. 549, 562 (1995) (emphasis added).

167. *Id.* at 563.

168. See *Drones for Agricultural Crop Surveillance*, PRECISION DRONE,

from water shortages or scarcity of resources, like California, could meaningfully benefit from a farming community able to utilize UAS to monitor their fields and allocate water and resources more efficiently and effectively. In other fields, too, the capacity to use commercial UAS would not only awaken a promising market, but also provide an opportunity for the inchoate industry to grow and develop alongside evident and urgent communal needs. That these benefits would coincide with more robust protections for individuals' property interests in airspace generally, thereby buttressing individuals' tangential interests in privacy and property, is an added bonus. States and municipalities, in turn, would benefit from "having a say" in how individuals and organizations could use UAS, and in encouraging certain uses having peculiar benefit to the state.

Put simply, airspace extends from the space between blades of grass up to the stratosphere.¹⁶⁹ The federal government lays claim to all of it, and until now, their position was largely accepted, as the uses one could put to airspace remained limited.¹⁷⁰ The emerging UAS industry's ever-expanding list of productive capacities¹⁷¹ makes this comparatively narrow area of non-navigable airspace far more valuable than ever before. As such, the federal government's position is untenable and unwise in the evolving arena of airspace, and entities at all levels have much to gain and nothing to lose in changing course. Any change, however, must predate the FAA's regulations in order to maximize its potential benefits.

2. Getting There and Back Again

Including a jurisdictional element in the FMRA is not a minor change. It would represent a sea change in the scheme and theory of federal power over airspace thus far. The FAA does not simply choose not to regulate model aircraft, but is *prohibited* from regulating them in the text of the FMRA.¹⁷² If

<http://www.precisiondrone.com/agriculture> (last visited Oct. 15, 2015) ("Using drones for crop surveillance can drastically increase farm crop yields while minimizing the cost of walking the fields or airplane fly-over filming").

169. See BLACK'S LAW DICTIONARY (10th ed. 2014) (defining "airspace" as "[t]he space that extends upward from the surface of land").

170. See generally Parts I.B, II.A.

171. See, e.g., Joseph Dussault, *7 Commercial Uses for Drones*, BOS. GLOBE (Mar. 14, 2014), <http://www.boston.com/business/2014/03/14/commercial-uses-for-drones/dscS47PsQdPneIB2UQeYOM/story.html>.

172. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 336, 126 Stat. 11, 77 (2012).

the FMRA is amended to include a jurisdictional element, then Congress essentially says that the federal government—and by extension, the FAA—does not have exclusive sovereignty over airspace. As discussed, this is likely *already* true, but the proposition nevertheless contravenes a nearly century-old federal policy and a strictly top-down regulatory framework. This is not, therefore, an issue the FAA takes lightly.

Add to this Americans’ skepticism of UAS,¹⁷³ and surpassing the already-inevitable congressional gridlock may seem improbable. A recent poll suggests a 2:1 ratio of Americans opposed to commercial operation of UAS against those in favor, although there was more support for uses like “inspecting oil platforms and bridges,” mapping “terrain through aerial photography,” and “monitor[ing] wildlife.”¹⁷⁴ This skepticism will certainly temper any attempt to corral the requisite political capital to amend the FMRA.

In lieu of an amendment to the FMRA, states should continue to promulgate regulations relating to UAS. Already, many states have passed laws relating to intrastate UAS use in anticipation of the economic benefits expected to flow therefrom.¹⁷⁵ Although uncertainty in the law has compelled some states to hedge and qualify enacted measures,¹⁷⁶ the *Pirker* decisions—alongside the history belying the current regulatory framework—cast doubt upon the federal government’s asserted supremacy in the field. If states begin to promote their interests in non-navigable airspace, they will gain headway in shaping and defining the manner by which individuals utilize airspace, particularly UAS, in their jurisdictions.

B. HAVING THE CAKE AND EATING SOME

Amending the FMRA will not eliminate the ambiguities inherent in the modern regulatory framework that governs airspace. Even if the federal government’s regulatory power in this area is construed as limited to navigable airspace *or* activi-

173. See Turza, *supra* note 12, at 321 (“Many Americans are skeptical, if not outright scared, of having drones flying over suburbia invading their backyard barbeque privacy.”).

174. Joan Lowy & Jennifer Agiesta, *Poll: Americans Skeptical of Commercial Drones*, PHYS.ORG (Dec. 19, 2014), <http://phys.org/news/2014-12-poll-americans-skeptical-commercial-drones.html>.

175. See, e.g., S. 1892, 2014 Gen. Assemb., 108th Reg. Sess. (Tenn. 2014).

176. See, e.g., H.R. 1029, 2014 Leg., Reg. Sess. (La. 2014) (“The provisions of this Section shall apply unless preempted by applicable federal law or by regulations adopted by the [FAA].”).

ties in non-navigable airspace that affect interstate commerce, a great many small-scale activities may indeed fall within the ambit of congressional power under the Commerce Clause.¹⁷⁷ Further, the FAA and Congress may persist in their theory that the federal government reigns supreme above state and municipal governments in the realm of navigable *and* non-navigable airspace, despite conceding that “model aircraft” include those aircraft used for commercial purposes which do not affect interstate commerce. The FAA, for instance, may continue sending cease-and-desist letters to individuals and companies that utilize UAS, and may continue pursuing litigation against individuals like Raphael Pirker. Regulatory efforts, likewise, may continue to flow from the federal government, with states reticently asserting authority in its wake, and subject to federal preemption. The battle for control over airspace will persist until resolved definitively.

Nor will an amendment address the FAA’s safety concerns about UAS in the national airspace. The proximity of non-navigable airspace requires UAS operators to ensure their UAS can adequately maintain a safe altitude, steer clear of airports, and remain within their line of sight. Indeed, on the rare occasion that the FAA issues a certificate of authorization to private parties for commercial UAS operations, it indicates the importance of preserving the integrity of the navigable airspace, and of protecting persons and property on the ground.¹⁷⁸ Furthermore, the FMRA cements the FAA’s right to pursue action against anyone who recklessly operates a UAS.¹⁷⁹ The FAA’s prime duty, historically, has been to ensure safety in the air and on the ground with regard to air commerce. There

177. This might depend on the size and influence of the entity using the technology. A large-scale farming operation that undertakes to use commercial UAS to facilitate its enterprise may well have a greater impact on interstate commerce than a local farmer who oversees one or two parcels. A national news agency that uses drones to gather photographs may be subject to federal regulation, as compared to a local news company whose influence and readership remains narrowly confined to a single (or several) localities. A powerful film company that employs drones to capture footage for use in a major motion picture would likely fall within the scope of federal regulatory power, whereas an independent filmmaker may not. Of course, the distinction between what is truly national and what is truly local remains a thorny issue, *see generally* Wickard v. Filburn, 317 U.S. 111 (1942), and any speculation on the impact of these activities should be tempered by the prospect of further clarification from Congress and the courts.

178. *See* *Astraeus Aerial*, Docket No. FAA-2014-0352 (FAA Sept. 25, 2014).

179. *See supra* note 5.

seems little doubt, therefore, that safety considerations weigh heavily on Congress's decision to effectively bar commercial UAS before the FAA issues a comprehensive system of regulations. Amending the FMRA, and thereby permitting small-scale use of UAS in non-navigable airspace across the country, leaves issues posed by *large-scale* use of UAS unaddressed.

Despite these limitations, an amendment to the FMRA would serve to clarify somewhat persistent ambiguities in the modern regulatory framework that needlessly complicate enforcement efforts. Although ambiguity will remain as to what level of government controls what altitudes under what circumstances, the proposed amendment would send a clear message that non-navigable airspace falls *primarily* within states' prerogative and preserves individual interests in airspace. This message does not substantially abrogate federal authority over non-navigable airspace so much as it shifts the balance of regulatory power over non-navigable airspace toward the states. Its message is *implicit*, not explicit, and the prospective benefits it offers to individuals, states, and even the FAA far outweigh the abstract loss of federal regulatory control over a narrow spatial corridor.

Additionally, the FAA cannot offer a satisfactory safety-based justification for expansive regulatory power over non-navigable airspace. As discussed, commercial UAS and model aircraft operating below navigable airspace pose identical risks to persons and property on the ground.¹⁸⁰ Why one should go unregulated while the other idles in a legal purgatory seems inexplicable, and at times utterly counterintuitive. Indeed, the FMRA fails to specify what altitudes "model aircraft" operators should or should not maintain, indicating that one may fly a model aircraft (strictly for hobby or recreational use) in the *navigable* airspace without violating any relevant law or regulation. If the FAA considers model aircraft in the navigable airspace safe, then small-scale commercial operation of UAS below the navigable airspace cannot possibly pose any special danger to the navigable airspace, let alone persons or property on the ground. The proposed amendment would therefore not jeopardize the security of the national airspace system.

180. See *supra* Part II.B.

CONCLUSION

Entities at all levels—that is, the federal government, states, municipalities, and individuals—share interests in preserving the integrity of the national airspace system. The federal government, however, has asserted sovereignty over all airspace, thereby reducing the primacy of other entities' interests in using and controlling activities within overlying airspace. This state of the law is inconsistent with the history and development of airspace regulation, which reflects an unabating recognition of individual interests in overlying airspace, as well as pervasive state prerogative to shape and define individuals' rights to use and enjoy that space. In this respect, there seems an incompatibility between the current regulatory hierarchy and the rights traditionally afforded individuals to superadjacent airspace.

The advent of commercial UAS technology brings this conflict to the fore. Commercial UAS carry the potential to transform the way individual and governmental entities use and govern airspace. But federal policy, as it stands now, has hampered individuals' capacity to make productive use of UAS, and stifled the developing UAS industry. Amending the FMRA's definition of "model aircraft" to permit commercial uses not in or affecting commerce would address this issue by clarifying federal and state roles in regulating airspace, and by protecting individual interests in airspace. The additional clarity such an amendment would imbue in the modern regulatory landscape with regard to federal and state authority would provide long-lasting benefits to the structure and content of both federal and state regulations in the future. As a result, the states and individuals with a significant interest in commercial operations of UAS would find themselves able to pursue these interests without federal interference, and in a manner that allows the young industry to grow and develop to meet local needs around the country.