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Aerial Trespass and the Fourth Amendment

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NOTE

AERIAL TRESPASS AND THE FOURTH AMENDMENT

*Randall F. Khalil**

Since 1973, courts have analyzed aerial surveillance under the Fourth Amendment by applying the test from Katz v. United States, which states that a search triggers the Fourth Amendment when a government actor violates a person’s “reasonable expectation of privacy.” The Supreme Court applied Katz to aerial surveillance three times throughout the 1980s, yet this area of the law remains unsettled and outcomes are unpredictable. In 2012, the Supreme Court recognized an alternative to the Katz test in Jones v. United States, which held that a search triggers the Fourth Amendment when a government actor physically intrudes into a constitutionally protected space with the intent to obtain information. Courts have largely avoided applying the Jones intrusion test to aerial surveillance. This Note explores the intersection of the Fourth Amendment, aerial property rights, and government use of drones. It argues that the Jones intrusion test can be a useful doctrinal tool for analyzing aerial surveillance under the Fourth Amendment. This issue will only grow in importance as law enforcement expands its use of drone technology.

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INTRODUCTION

In May 2018, Long Lake Township in Northern Michigan hired a drone operator to conduct surveillance on Todd Maxon’s backyard on the suspicion he was in violation of the municipality’s zoning ordinance.¹ The Michigan Court of Appeals held that this drone surveillance violated the Fourth Amendment’s protection against unreasonable searches and seizures.² *Maxon* appears to be the first time a United States court declared an instance of aerial drone surveillance a search triggering the Fourth Amendment. The court’s analysis illustrated the reality that Fourth Amendment doctrine, as applied to aerial searches, is unsettled and unpredictable.

1. Brief in Support of Motion to Suppress Evidence at 2–3, *Long Lake Twp. v. Maxon*, No. 2018034553CE, 2019 WL 12379318 (Mich. Cir. Ct. Apr. 19, 2019); Plaintiff’s Response in Opposition to Defendant’s Motion to Suppress Evidence at 2, *Maxon*, No. 2018034553CE, 2019 WL 12312060.

2. *Long Lake Twp. v. Maxon*, 970 N.W.2d 893 (Mich. Ct. App. 2021), *vacated*, 973 N.W.2d 615 (Mich. 2022).

The dominant Fourth Amendment test from *Katz v. United States* states that a search triggers the Fourth Amendment when a government actor violates a person's "reasonable expectation of privacy."³ Between 1967 and 2012, the *Katz* "reasonable expectations" test was the sole Fourth Amendment test. Courts first began to apply the Fourth Amendment to aerial surveillance in the 1970s in cases involving fixed-wing aircraft and helicopters.⁴ In 2012, the Supreme Court recognized an alternative trespass-based Fourth Amendment test in *United States v. Jones*, which held that the Fourth Amendment is triggered when a government actor physically intrudes into a constitutionally protected space with intent to obtain information.⁵ Since 2012, no court has dispositively applied the *Jones* intrusion test to aerial surveillance.

Clarity remains as important as ever in this area of the law. Use of drones to conduct aerial surveillance has become cheap and easy,⁶ and law enforcement's use of drones will continue to expand.⁷ This Note argues that the *Jones* trespass test can apply to aerial surveillance more workably than the existing *Katz* approach, and would lead to more predictable results and better secure citizens' privacy. Part I recounts existing Fourth Amendment doctrine and historical applications of the *Katz* test to aerial surveillance. Part II examines the history of aerial trespass in Anglo-American law and attempts to answer the yet-unresolved question of how far landowners' property rights extend into the air (at least for Fourth Amendment purposes). Part III explains how an aerial trespass test would work and applies it to several prominent aerial surveillance cases decided under *Katz*.

I. CURRENT FOURTH AMENDMENT DOCTRINE

The Fourth Amendment states, "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated."⁸ The Court has explained that the purpose of the Fourth Amendment is to protect "the privacy and security of individuals against arbitrary invasions by governmental officials."⁹ Courts have long looked to property law for guidance in interpreting the reach of the Fourth

3. 389 U.S. 347, 360 (1967) (Harlan, J., concurring).

4. *E.g.*, *People v. Sneed*, 108 Cal. Rptr. 146, 151 & n.1 (Ct. App. 1973).

5. 565 U.S. 400 (2012).

6. *See* Andrew B. Talai, *Drones and Jones: The Fourth Amendment and Police Discretion in the Digital Age*, 102 CALIF. L. REV. 729, 736–44 (2014) (explaining the proliferation of drone technology in law enforcement as a problem of police discretion).

7. *See, e.g.*, Dave Maass & Mike Katz-Lacabe, *Alameda and Contra Costa County Sheriffs Flew Drones over Protests*, ELEC. FRONTIER FOUND.: DEEPLINKS BLOG (Dec. 5, 2018), <https://www.eff.org/deeplinks/2018/12/alameda-and-contra-costa-county-sheriffs-flew-drones-over-protests> [perma.cc/D3E9-T8TF].

8. U.S. CONST. amend. IV.

9. *Carpenter v. United States*, 138 S. Ct. 2206, 2213 (2018) (quoting *Camara v. Mun. Ct.*, 387 U.S. 523, 528 (1967)).

Amendment.¹⁰ Formally, there are two distinct inquiries in a Fourth Amendment analysis: (1) whether the government has conducted a search or seizure under the Fourth Amendment; and (2) if so, whether the search or seizure was reasonable.¹¹ Courts frequently blur the line between these two inquiries.¹² This Note concerns only the first question: when the Fourth Amendment is triggered.

A. *The Katz “Reasonable Expectations” Test Applied to Aerial Surveillance*

To determine whether a Fourth Amendment search has occurred, the Supreme Court has historically applied the *Katz* “reasonable expectation of privacy” test.¹³ Under *Katz*, a Fourth Amendment search occurs when the government violates a subjective expectation of privacy that society recognizes as reasonable.¹⁴ In the context of aerial surveillance, the most important factor the Supreme Court considers is positive law—specifically FAA regulations—and whether the airspace from which the surveillance took place was open to the public. The second most important factor is the probability or frequency of public access. Finally, the lower courts have viewed “disruptiveness” as another important factor; sensitivity of setting and government intent have also proven lesser, but present, factors. The Supreme Court has never found aerial surveillance to be a Fourth Amendment search, but lower courts sometimes do.

10. See *Byrd v. United States*, 138 S. Ct. 1518, 1526–27 (2018) (quoting *Rakas v. Illinois*, 439 U.S. 128, 143 n.12 (1978)) (citing 2 WILLIAM BLACKSTONE, COMMENTARIES ch. 1) (explaining that the reach of the Fourth Amendment can be assessed by analogy to property law principles, including the “right to exclude others”). See generally Laura K. Donohue, *Functional Equivalence and Residual Rights Post-Carpenter: Framing a Test Consistent with Precedent and Original Meaning*, 2018 SUP. CT. REV. 347; William Baude & James Y. Stern, *The Positive Law Model of the Fourth Amendment*, 129 HARV. L. REV. 1821, 1833–35, 1867–71 (2016); Orin S. Kerr, *Four Models of Fourth Amendment Protection*, 60 STAN. L. REV. 503, 516 (2007).

11. See, e.g., *Michigan v. Tyler*, 436 U.S. 499, 506 (1978) (holding that an unconsented search is presumptively unreasonable unless backed by a warrant and probable cause); *Camara v. Mun. Ct.*, 387 U.S. 523 (same); *Johnson v. United States*, 333 U.S. 10, 14 (1948) (holding that a warrant must be issued by a “neutral and detached magistrate”).

12. See e.g., *State v. Davis*, 360 P.3d 1161, 1172 (N.M. 2015) (“[W]e find an unreasonable, unconstitutional search under the U.S. Constitution.”).

13. *Katz v. United States*, 389 U.S. 347, 360 (1967) (Harlan, J., concurring); *Carpenter*, 138 S. Ct. at 2217 (applying the “reasonable expectations” test). Some scholars argue, however, that in practice, the Court has reduced the *Katz* test to a single question: whether one has an objectively reasonable expectation of privacy. See, e.g., Orin S. Kerr, *Katz Has Only One Step: The Irrelevance of Subjective Expectations*, 82 U. CHI. L. REV. 113, 115 (2015) (arguing that “the scope of *Katz* is a normative question rather than a descriptive claim about what people actually expect”).

14. E.g., *Smith v. Maryland*, 442 U.S. 735, 740 (1979); *Katz*, 389 U.S. at 361 (Harlan, J., concurring).

1. Positive Law

Whether FAA regulations permit public access to airspace was the decisive factor in two of the three aerial surveillance cases decided by the Supreme Court and a necessary factor in the third. In *Ciraolo v. California*, law enforcement flew a fixed-wing aircraft 1,000 feet above a defendant's backyard to search for marijuana plants.¹⁵ The Court held that this was not a Fourth Amendment search; the defendant's expectation of privacy was "unreasonable" because "[a]ny member of the public flying in [the] airspace who glanced down could have seen everything that these officers observed."¹⁶ In *Dow Chemical*, decided the same day as *Ciraolo*, the EPA hired an aerial photographer to take pictures of the Dow Chemical's Midland, Michigan plant from various altitudes no lower than 1,200 feet as part of an emissions compliance investigation.¹⁷ The Court held that the aerial photography was not a Fourth Amendment search because the aircraft was lawfully within navigable airspace the entire time the photographs were taken.¹⁸

Lower courts also routinely find that aerial surveillance is not a Fourth Amendment search when there is lawful public access to the airspace.¹⁹ And in at least one case, lack of lawful public access led a court to conclude that the Fourth Amendment was triggered. In 2009, the Ohio Court of Appeals held in *State v. Little* that police helicopter surveillance conducted 100 to 600 feet above the defendants' property triggered the Fourth Amendment because the pilot operated illegally in "closed" airspace near the Dayton International Airport.²⁰ The court concluded that the aircraft violated the defendants' reasonable expectation of privacy "when it viewed the contraband on [their] property" within the FAA-restricted airspace.²¹

Lack of lawful public access was also relevant in *People v. Sneed*—the first aerial surveillance Fourth Amendment case decided in any court in the United States.²² There, the California Court of Appeal suggested that a police helicopter hovering twenty to twenty-five feet above the defendant's backyard was

15. 476 U.S. 207 (1986).

16. *Ciraolo*, 476 U.S. at 213–14.

17. *Dow Chem. Co. v. United States*, 476 U.S. 227, 229 (1986).

18. *Id.* at 239.

19. *E.g.*, *Giancola v. W. Va. Dep't of Pub. Safety*, 830 F.2d 547 (4th Cir. 1987); *United States v. Breza*, 308 F.3d 430 (4th Cir. 2002).

20. *State v. Little*, 918 N.E.2d 230, 236–37 (Ohio Ct. App. 2009), *appeal dismissed*, 928 N.E.2d 735 (Ohio 2010) (citing 14 C.F.R. § 91.130(c)(1) (2009)).

21. *Id.* at 236–38. FAA regulations require aircraft entering closed airspace to inform air traffic control (ATC) "of [an] intention to fly in that area, [and] maintain contact with the ATC." *Id.* at 237; *see also* 14 C.F.R. § 91.130(c)(1) (2009).

22. 108 Cal. Rptr. 146 (Ct. App. 1973); Tom Bush, Comment, *A Privacy-Based Analysis for Warrantless Aerial Surveillance Cases*, 75 CALIF. L. REV. 1767 & n.3 (1987).

“probably illegal.”²³ But this analysis was not necessary to the court’s conclusion.²⁴

2. Frequency of Public Access

The second most important factor in Fourth Amendment aerial surveillance case law is the probability or frequency of public access into the airspace at a given altitude. This was the decisive factor in Justice O’Connor’s concurring opinion in *Florida v. Riley*,²⁵ which provided the critical fifth vote concluding that a helicopter flyover was not a Fourth Amendment search. In *Riley*, a law enforcement helicopter hovered 400 feet over the defendant’s home for several minutes and discovered marijuana growing in a greenhouse.²⁶ A fractured Court held that this did not implicate the Fourth Amendment. Justice White’s plurality opinion reasoned that it was “of obvious importance that the helicopter . . . was *not* violating the law,” because FAA regulations provided that “[a]ny member of the public could legally have been flying over Riley’s property in a helicopter at the altitude of 400 feet and could have observed Riley’s greenhouse.”²⁷

But O’Connor’s concurrence argued that FAA regulations concerned safety rather than compliance with the Fourth Amendment, and that the test for determining if the defendant had a reasonable expectation of privacy should instead be “whether the helicopter was in the public airways at an altitude at which members of the public travel with sufficient regularity.”²⁸ O’Connor concluded without evidence that such overflights were sufficiently common and, therefore, Riley’s expectation of privacy was unreasonable.²⁹

23. *Sneed*, 108 Cal. Rptr. at 151 & n.1.

24. I read this as dictum because *Sneed*’s overall conclusion—that the Fourth Amendment was implicated—relied on the court’s finding that noisy police observation by helicopter at a height of twenty to twenty-five feet was “an unreasonable governmental intrusion into serenity and privacy of defendant’s backyard.” *Id.* at 146. Therefore, I interpret the discussion of lawful presence and the observation that the helicopter was “probably” illegal as unnecessary to the conclusion.

25. 488 U.S. 445, 452–55 (1989) (O’Connor, J., concurring).

26. *Riley*, 488 U.S. at 448 (plurality opinion).

27. *Id.* at 451. Although FAA rules permitted helicopters to fly below the minimum safe altitudes prescribed for other aircraft, they are required to “comply with routes or altitudes specifically prescribed for helicopters by the [FAA] Administrator.” *Id.* at 451 n.3 (quoting 14 C.F.R. § 91.79 (1988)). This requirement remains today. See 14 C.F.R. § 91.119(d) (2022).

28. *Riley*, 488 U.S. at 454 (O’Connor, J., concurring).

29. See *id.* at 455.

Lower courts often similarly assume, without justification, that frequent public access defeats a reasonable expectation of privacy,³⁰ but sometimes they require proof that overflights were, in fact, common to show the expectation of privacy was not reasonable at all.³¹

3. Disruptiveness

In the small subset of aerial surveillance cases in lower courts that concluded the Fourth Amendment was triggered, disruptiveness was often the critical factor. Justice White's plurality opinion in *Florida v. Riley* suggested that it was relevant that the helicopter did not "interfere[] with respondent's normal use of the greenhouse or of other parts of the curtilage" and that there was "no undue noise, and no wind, dust, or threat of injury."³² Lower courts subsequently latched onto this dictum.

In 1990, the Pennsylvania Supreme Court held in *Commonwealth v. Ogli-aloro* that aerial surveillance of a barn triggered the Fourth Amendment when a helicopter hovered fifty feet above the barn for fifteen seconds and passed over the barn at least three times over five minutes.³³ It was critical to the court that the helicopter flight posed a risk of harm to the resident and her property, and that the resident was "present in the home at the time" and "experienced . . . loud noise, and vibration of the house and windows."³⁴ Similarly, the Colorado Court of Appeals held in *People v. Pollock* that helicopter aerial surveillance constituted a Fourth Amendment search when a helicopter "descended to 200 feet, . . . hovered in the area [of the defendant's property] for several minutes," and created "enough noise that numerous people ran out" to see what was happening.³⁵

Another example in which a court found disruptiveness to be the decisive factor comes from New Mexico. In 2015, the New Mexico Supreme Court held in *State v. Davis* that a helicopter search at an altitude of fifty feet triggered the Fourth Amendment because a helicopter flight at such a low altitude possessed

30. See, e.g., *United States v. Breza*, 308 F.3d 430, 434–35 (4th Cir. 2002); *United States v. Warford*, 439 F.3d 836, 843 (8th Cir. 2006); *United States v. Boyster*, 436 F.3d 986, 992 (8th Cir. 2006).

31. See, e.g., *People v. Pollock*, 796 P.2d 63, 64–65 (Colo. App. 1990).

32. *Riley*, 488 U.S. at 452 (O'Connor, J., concurring). The opinion did not explain why disruptiveness is relevant to finding a reasonable expectation of *privacy*. Perhaps it was relevant to reach the conclusion that the helicopter lawfully complied with FAA regulations, because FAA regulations permit a helicopter to fly below minimum safe altitudes only "if . . . conducted *without hazard to persons or property on the surface*." *Id.* at 451 n.3 (majority opinion) (emphasis added) (quoting 14 C.F.R. § 91.79 (1988)). It is noteworthy that this reasoning invokes a property law principle—the "interference with actual use" requirement in aerial trespass actions. See discussion *infra* note 106 and accompanying text.

33. 579 A.2d 1288, 1294 (Pa. 1990).

34. *Ogli-aloro*, 579 A.2d at 1290, 1294.

35. *Pollock*, 796 P.2d at 63–65.

a great “degree of intrusiveness” and posed a “risk of actual physical intrusion.”³⁶ The court found it relevant that the helicopter caused minor property damage, generated excessive noise, and kicked up dust and debris.³⁷

4. Sensitivity of Information

Courts sometimes consider the sensitivity of the information likely to be obtained when assessing whether the Fourth Amendment is triggered in aerial surveillance. But this factor is rarely, if ever, dispositive. In *Dow Chemical*, the court indicated that the industrial nature of the chemical plant surveilled brought the case into the “open fields doctrine” and suggested that the chemical plant was less protected than the private home surveilled in *Ciraolo*.³⁸ The open fields doctrine states that open fields are not protected by Fourth Amendment;³⁹ its rationale is that open fields “do not provide the setting for those intimate activities that the Amendment is intended to shelter.”⁴⁰ But this distinction seems irrelevant since, in both *Dow Chemical* and *Ciraolo*, it was dispositive that surveillance took place from navigable airspace open to the public.⁴¹

5. Intent to Surveil

In *Sneed*,⁴² the California Court of Appeal concluded that the helicopter search triggered the Fourth Amendment and found it critical that the police officers had a subjective *intent to surveil* the defendant.⁴³ No other aerial surveillance case has discussed intent to surveil, possibly because such intent is obvious in context. And Fourth Amendment doctrine has since evolved such that a police officer’s subjective intent to surveil alone is not sufficient to implicate the Fourth Amendment.⁴⁴

36. 360 P.3d 1161, 1164, 1169, 1171 (N.M. 2015).

37. *Davis*, 360 P.3d at 1171.

38. *Dow Chem. Co. v. United States*, 476 U.S. 227, 239 (1986) (“We conclude that the open areas of an industrial plant complex . . . are not analogous to the ‘curtilage’ of a dwelling for purposes of aerial surveillance; such an industrial complex is more comparable to an open field . . .”) (footnote omitted).

39. *E.g.*, *Hester v. United States*, 265 U.S. 57 (1924).

40. *Oliver v. United States*, 466 U.S. 170, 179 (1984).

41. *Dow Chemical*, 476 U.S. at 239; *Ciraolo v. California*, 476 U.S. 207, 215 (1986).

42. 108 Cal. Rptr. 146 (Ct. App. 1973).

43. *Sneed*, 108 Cal. Rptr. at 150–51.

44. *See, e.g.*, *Whren v. United States*, 517 U.S. 806, 813 (1996) (explaining that an officer’s real reason for making the stop must “play no role” in Fourth Amendment analysis); *Bond v. United States*, 529 U.S. 334, 338 n.2 (2000) (“The parties properly agree that the subjective intent of the law enforcement officer is irrelevant in determining whether that officer’s actions violate the Fourth Amendment.”); *Brigham City v. Stuart*, 547 U.S. 398, 404 (2006) (“The officer’s subjective motivation is irrelevant.”).

B. *The Jones Intrusion Test*

In 2012, the Supreme Court articulated an alternative to the *Katz* test in *United States v. Jones*.⁴⁵ In *Jones*, the Court held that a Fourth Amendment search occurs whenever a government actor physically intrudes into a constitutionally protected space with an intent to obtain information.⁴⁶ The Court found that the warrantless installation of a GPS tracker onto a car, and use of that tracker to monitor the car's location, triggered the Fourth Amendment.⁴⁷ The Court has subsequently applied *Jones*'s trespass test in only one subsequent case, *Florida v. Jardines*, which held that police officers bringing a drug-sniffing dog onto the front porch of a home was a search triggering the Fourth Amendment.⁴⁸ While *Jones* represented a departure from the Court's exclusive reliance on *Katz*, it was consistent with a line of cases before *Katz* in which a Fourth Amendment search required "intrusion into a constitutionally protected area."⁴⁹

Both *Jones* and *Jardines* rely on analogy to property torts to determine the reach of the Fourth Amendment. *Jones* analogized to the tort of trespass to chattels to determine whether a physical intrusion had taken place.⁵⁰ *Jardines* analogized to implied licenses and custom to determine whether the homeowner had implicitly consented to members of the public marching their drug-sniffing dogs onto the defendant's front porch to search for drugs.⁵¹

This Note will argue that the *Jones* test should form the backbone of any Fourth Amendment aerial trespass test. However, I have found no cases in which a court has relied on *Jones* (or *Jardines*) in analyzing aerial surveillance under the Fourth Amendment.⁵² The key questions that must be resolved before applying the *Jones* test to aerial surveillance are: (1) What counts as trespass in air and (2) Which air is "constitutionally protected?" Part II addresses these questions.

45. *United States v. Jones*, 565 U.S. 400, 406 (2012).

46. *Id.* at 404–05.

47. *Id.* at 404–11.

48. *Florida v. Jardines*, 569 U.S. 1, 4–6 (2013).

49. *Silverman v. United States*, 365 U.S. 505, 512 (1961) (Douglas, J., concurring) (holding that police officers' placement of a bugging device was a Fourth Amendment search because it penetrated the wall of the defendant's house, and was therefore "an actual intrusion"); *see also* *Olmstead v. United States*, 277 U.S. 438, 465 (1928) (holding that the Fourth Amendment was not implicated where federal officers tapped defendant's telephone line because the wires were not part of defendant's house and thus there was no physical intrusion); *United States v. Knotts*, 460 U.S. 276, 286 (1983) (Brennan, J., concurring) (opining that *Katz* only supplemented but did not overrule the earlier line of trespass-based cases).

50. *Jones*, 565 U.S. at 404–05, 411 (citing *Entick v. Carrington* (1765) 95 Eng. Rep. 807 (PC) (trespass-to-chattels case)).

51. *Jardines*, 569 U.S. at 8–10.

52. I am aware of only *Long Lake Township v. Maxon*, discussed in the next Section, in which the court discussed, but did not rely on, *Jones*. *Long Lake Twp. v. Maxon*, 970 N.W.2d 893, 905 (Mich. Ct. App. 2021), *vacated*, 973 N.W.2d 615 (Mich. 2022).

C. Long Lake Township v. Maxon

In *Long Lake Township v. Maxon*, the Michigan Court of Appeals, applying *Katz*, held that flying a drone over the defendants' property at a height lower than 400 feet triggered the Fourth Amendment.⁵³ A northern Michigan municipality investigated a junk and salvage operation on the defendants' property for alleged violations of the township's residential zoning restrictions and hired a drone operator to photograph the defendants' property.⁵⁴ The Michigan Court of Appeals held that the drone surveillance was a Fourth Amendment search and suppressed the drone's photographic evidence from use in a civil enforcement action.⁵⁵ Applying *Katz*, the court held that the defendants had a "reasonable expectation of privacy in their property against drone surveillance."⁵⁶ Distinguishing the Supreme Court's aerial surveillance cases that found no Fourth Amendment search, the court here noted that "drones are qualitatively different from airplanes and helicopters: they are vastly smaller" and fly at lower altitudes.⁵⁷

Although the court grounded its conclusion in *Katz*, its reasoning blurred the line between "reasonable expectation of privacy" and physical intrusion.⁵⁸ The court said that because drones fly "below what is usually considered public or navigable airspace," "flying them at legal altitudes over another person's property without permission or a warrant would reasonably be expected to constitute a trespass."⁵⁹ But the court did not decide whether the drone committed a trespass, saying "there is little meaningful distinction" between whether the drone was located just inside or just outside the property line.⁶⁰

II. DEFINING AERIAL TRESPASS

Adopting a trespass-based Fourth Amendment test for aerial surveillance requires answering the yet-unresolved questions of who owns the air and which airspace is in the public domain. United States citizens accept that airplanes may fly over our properties, perhaps because we benefit from them, or perhaps because they typically cause us no harm.⁶¹ The Court has applied the

53. *Id.*

54. *Id.* at 897.

55. *Id.* at 904. On remand, the Michigan Court of Appeals affirmed the trial court and held that suppression of the aerial photograph evidence was an improper remedy in civil cases, regardless of whether the Fourth Amendment was triggered. *Long Lake Twp. v. Maxon*, No. 349230, 2022 WL 4281509, at *7–8 (Mich. Ct. App. Sept. 15, 2022). Application of the exclusionary rule is beyond the scope of this Note.

56. *Maxon*, 970 N.W.2d at 905.

57. *Id.* at 904.

58. *Id.* at 905.

59. *Id.* at 904–05.

60. *Id.* at 905.

61. THOMAS W. MERRILL & HENRY E. SMITH, PROPERTY 14–15 (3d ed. 2017).

Jones test only to intrusions upon concrete *physical* spaces,⁶² but an intrusion by a drone into the airspace above a home is different. The extent to which landowners' property rights extend into the air is doctrinally unclear, as is the formal nature of the public's right to access navigable airspaces (i.e., whether the United States has title to navigable airspace or a public easement through privately owned airspace).

Section II.A recounts the history of the *ad coelum* principle, which reflects the common law concept that a surface owner's property rights extend infinitely upward into the heavens. Section II.B describes how the *ad coelum* principle evolved during the aviation era. And Section II.C explains Congress's assertion of national sovereignty in the air and its designation of publicly accessible "navigable airspace."

A. The Ad Coelum Principle

One of the earliest known English cases governing ownership of airspace is from 1598 and involved a landlord suing his neighbor for building a house that hung over his property line.⁶³ The defendant did not trespass onto the plaintiff's *ground* but was found liable nonetheless.⁶⁴ This aerial trespass principle was included in Chief Justice Edward Coke's *Institutes of the Laws of England*, in which he explained that land was not just two-dimensional, but encompassed "[air] and all other things even up to heaven; for *cujus est solum ejus est usque ad coelum*."⁶⁵ The *ad coelum* principle in English common law has roots in the Roman Law revival of the twelfth and thirteenth centuries,⁶⁶ and may have been a historical accident caused by misinterpretation of Roman civil law.⁶⁷

62. *United States v. Jones*, 565 U.S. 400 (2012) (GPS tracker on a car); *Florida v. Jardines*, 569 U.S. 1 (2013) (drug-sniffing dog on the front porch of a house).

63. *Penruddock's Case* (1598) 77 Eng. Rep. 210; 5 Co. Rep. 100b (KB); Adolph C. Hugin, *Airspace Rights and Liabilities As Affected by Aircraft Operation*, 26 NOTRE DAME L. REV. 620, 628 (1951).

64. *Penruddock's Case*, 77 Eng. Rep. 210.

65. STUART BANNER, WHO OWNS THE SKY? 16 (2008) (quoting 1 EDWARD COKE, INSTITUTES OF THE LAWS OF ENGLAND § 4(a) (15th ed. 1794)). Latin translation: "For whom the soil is, it is his also up to the heavens." (Translation is my own.)

66. The *ad coelum* principle had been a feature of English common law since the reign of King Edward I (1272–1307). See *Bury v. Pope* (1587) 78 Eng. Rep. 375 (KB) (explaining in a note: "*Cujus est solum, ejus est summitas usque ad coelum*. *Temp. Ed. 1.*" ["*Temp. Ed. 1.*" denotes that the rule originated in the time of Edward I.]); see also 1 FREDERICK POLLOCK & FREDERIC WILLIAM MAITLAND, THE HISTORY OF ENGLISH LAW BEFORE THE TIME OF EDWARD I 118–21 (2d ed. 1898); H. Goudy, *Two Ancient Brocards*, in ESSAYS IN LEGAL HISTORY 215, 229–30 (Paul Vinogradoff ed., 1913) (explaining that the maxim appeared in the Accursian gloss of Roman law, in the form, "*Cujus solum ejus esse debet usque ad coelum*.").

67. BANNER, *supra* note 65, at 87–89. For example, scholars have pointed out that the principle is in conflict with key tenets of Roman property law. Roman law limited the right of a landowner over his airspace to fifteen feet, restricted the height of the building an owner can construct on his land, and considered the air *res communis*—common to mankind and incapable

Regardless, American law incorporated the *ad coelum* rule. A few nineteenth-century cases, citing the *ad coelum* principle, considered whether overhanging tree branches were aerial trespasses.⁶⁸ In 1906, New York's highest court held that a telephone wire strung thirty feet over a plaintiff's house was a trespass, reasoning that the "plaintiff as the owner of the soil owned upward to an indefinite extent . . . [including] the space occupied by the wire, and had the right to the exclusive possession of that space."⁶⁹ Courts also applied the principle to moving objects. In 1925, the Supreme Court of Montana held that a bullet fired from a shotgun that traveled above the plaintiff's land was "a technical trespass at least."⁷⁰ And in a 1922 takings case, the Supreme Court characterized multiple gun shots fired from a military base across the plaintiff's coastal resort as a trespass.⁷¹

B. *Erosion of the Ad Coelum Principle in the Aviation Era*

In 1903, the Wright brothers took their first flight. In the following decades, courts began to signal that the *ad coelum* rule should not be understood to mean that property ownership literally extended infinitely upward.⁷² Congress regulated aviation for the first time with the Air Commerce Act of 1926,⁷³ which declared that the United States "has, to the exclusion of all foreign nations, complete sovereignty of the airspace over the lands and waters of the United States."⁷⁴ The Act defined "navigable airspace" as "airspace above the minimum safe altitudes of flight prescribed by the Secretary of Commerce," and provided that "such navigable airspace shall be subject to a public right of freedom of . . . air navigation."⁷⁵ The corresponding House Report explained that "[t]he public right of flight in the navigable air space" is comparable to the "public easement of navigation in the navigable waters."⁷⁶

of private ownership. James Edward Geoffrey de Montmorency, *The Control of Air Spaces*, 3 PROBS. WAR 61, 63–65 (1917).

68. *E.g.*, *Lyman v. Hale*, 11 Conn. 177 (1836); *Hoffman v. Armstrong*, 48 N.Y. 201 (1872).

69. *Butler v. Frontier Tel. Co.*, 79 N.E. 716, 718 (N.Y. 1906).

70. *Herin v. Sutherland*, 241 P. 328, 331–32 (1925) (citing 2 WILLIAM BLACKSTONE, COMMENTARIES *18).

71. *Portsmouth Harbor Land & Hotel Co. v. United States*, 260 U.S. 327, 329–30 (1922) (stating that "[e]very successive trespass adds to the force of the evidence" that the government has imposed a servitude, i.e., a nonpossessory right to enter the property).

72. *See, e.g.*, *Hinman v. Pac. Air Lines*, 84 F.2d 755, 757 (1936); *United States v. Causby*, 328 U.S. 256, 261 (1945).

73. Air Commerce Act of 1926, ch. 344, 44 Stat. 568.

74. *Id.* § 6. The principle is codified in its current form as "[t]he United States Government has exclusive sovereignty of airspace of the United States." 49 U.S.C. § 40103(a)(1) (2018).

75. Air Commerce Act of 1926 § 10. As codified today, "'navigable airspace' means airspace above the minimum altitudes of flight prescribed by regulations under this subpart . . . including airspace needed to ensure safety in the takeoff and landing of aircraft," 49 U.S.C. § 40102(a)(32), and "[a] citizen of the United States has a public right of transit through the navigable airspace," 49 U.S.C. § 40103(a)(2).

76. H.R. REP. NO. 69–572, at 10 (1926).

In 1936, the Ninth Circuit held in *Hinman v. Pacific Air Lines Transport* that the *ad coelum* principle was not to be taken literally.⁷⁷ Landowners near an airport brought a trespass action against several airlines and sued to enjoin them from flying over their land.⁷⁸ The court denied the injunction, and explained that *ad coelum* was an antiquated principle that simply intended “that the owner of the land could use the overlying space to such an extent as he was able.”⁷⁹

The Ninth Circuit explained that *ad coelum* was inconsistent with two key attributes of property: (1) the exercise of dominion, and (2) the capacity for exclusive possession.⁸⁰ Landowners cannot exercise dominion in the upper reaches of the air, and such air lacks the capacity to be exclusively possessed. Established case law at the start of the twentieth century applied the *ad coelum* principle only to intrusions that were relatively close to the surface of the Earth—a telephone wire thirty feet high, a tree branch, a bullet shot from a gun at ground level, or a structure protruding from a neighboring building. The principle had never applied to objects flying thousands of feet high.

The Supreme Court denied certiorari to review *Hinman*,⁸¹ but in 1945, the Court adopted its key holding in *United States v. Causby*.⁸² A farmer close to a military airport in North Carolina sued the U.S. government for flying aircraft across his land at altitudes as low as eighty-three feet, which harmed his chicken-farming operations.⁸³ The Court reiterated that *ad coelum* does not apply literally,⁸⁴ but held that a landowner has “exclusive control of the immediate reaches of the enveloping atmosphere . . . [and] owns *at least* as much of the space above the ground as he can occupy or use in connection with the land.”⁸⁵

The Court also concluded that a taking had occurred.⁸⁶ Invoking the Air Commerce Act of 1926, the Court reasoned that “[t]he navigable airspace which Congress has placed in the public domain is ‘airspace above the minimum safe altitudes of flight prescribed’ ” by regulation.⁸⁷ The Court concluded that the flights in question, at an altitude of eighty-three feet, were well below

77. 84 F.2d 755, 757 (9th Cir. 1936).

78. *Hinman*, 84 F.2d at 755.

79. *Id.* at 757–58 (“[W]e cannot shut our eyes to common knowledge, the progress of civilization, or the experience of mankind. A literal construction of this formula will bring about an absurdity.”).

80. *Id.* at 758 (“We own so much of the space above the ground as we can occupy or make use of, in connection with the enjoyment of our land. This right is not fixed. It varies with our varying needs and is coextensive with them.”).

81. *Hinman v. Pac. Air Transp.*, 300 U.S. 654 (1937); *Hinman v. United Air Lines Transp. Corp.*, 300 U.S. 655 (1937).

82. 328 U.S. 256, 264 (1946).

83. *Causby*, 328 U.S. at 258–59.

84. *Id.* at 261.

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

86. *Id.* at 266–67.

87. *Id.* at 263.

the minimum allowed (which began at 300 feet). Thus, they were not within navigable airspace, which Congress had placed in the public domain.⁸⁸ *Causby* remains the basis of aerial takings claims today.⁸⁹

C. Aerial Trespass Today

So, what do *Causby*, *Hinman*, and the statutory scheme enacted by Congress tell us about how far property ownership extends into airspace? First, *ad coelum* does not apply literally, and federal law sets a clear upper bound on a landowner's property interest in airspace. Second, there is some minimal amount of airspace above land where trespass is actionable, but only if the trespass (i) occurs within the "immediate reaches"⁹⁰ of the land and (ii) results in "interference with actual . . . use"⁹¹ of the property. Property interests are most uncertain in the zone in between the "immediate reaches" and the boundary where navigable airspace begins.⁹² Lastly, state law plays a limited role in defining the scope of aerial property rights.⁹³

1. Clear Inferences

First, and most importantly, aerial trespass today has a clear upper bound. Property rights in land do not extend infinitely *ad coelum*. Congress first regulated aviation in 1926 and defined navigable airspace as the zone above a minimum safe altitude to be set by an agency. Property ownership of airspace thus extends at most to the point above which Congress permits all aircraft to access.⁹⁴ The FAA minimum safe altitudes in effect since 2010⁹⁵ are codified at 14 C.F.R. § 91.119:

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

....

(b) *Over congested areas.* Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

88. *Id.* at 263–64.

89. *See, e.g.,* McCarran Int'l Airport v. Sisolak, 137 P.3d 1110 (Nev. 2006); Claassen v. City & Cnty. of Denver, 30 P.3d 710, 712 (Colo. App. 2000); Thompson v. City & Cnty. of Denver, 958 P.2d 525, 526–28 (Colo. App. 1998).

90. RESTATEMENT (SECOND) OF TORTS § 159 (AM. L. INST. 1965).

91. *Id.* § 283; *Causby*, 328 U.S. at 266–67.

92. *See infra* Section II.C.2.

93. *See infra* Section II.C.3.

94. Air Commerce Act of 1926, § 10, 44 Stat. 568, 574.

95. Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft; Modifications to Rules for Sport Pilots and Flight Instructors with a Sport Pilot Rating, 75 Fed. Reg. 5223 (Feb. 1, 2010).

(c) *Over other than congested areas.* An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) *Helicopters, powered parachutes, and weight-shift-control aircraft.* If the operation is conducted without hazard to persons or property on the surface—

(1) A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.⁹⁶

This rule indicates that the highest minimum point at which navigable airspace begins is 1,000 feet above the highest obstacle within a radius of 2,000 feet in a “congested area.” The tallest building in the country currently is One World Trade Center in Manhattan standing at 1,776 feet.⁹⁷ So, the highest navigable airspace boundary anywhere in the country is at 2,776 feet within the 2,000-foot radius around One World Trade Center. In most parts of the country, located in “other than congested areas,” the upper bound is 500 feet.⁹⁸

Courts largely followed *Causby*'s theory of a “fixed height” limit.⁹⁹ The rule promoted some degree of certainty and discouraged litigation by making clear that no trespass claim is actionable in airspace above the altitude where navigable airspace begins.¹⁰⁰ Determining whether an area is “congested,” “other than congested,” or “sparsely populated” can be a tricky, fact-specific inquiry, but FAA adjudications, FAA guidance documents, and case law provide clarity.¹⁰¹

Second, *Causby* clarifies that there is *some* amount of airspace—the “immediate reaches”—in which trespass is actionable.¹⁰² The “immediate reaches”

96. 14 C.F.R. § 91.119 (2022). “Weight-shift-control aircraft” includes hang gliders and similar devices. U.S. DEP'T. OF TRANSP., FED. AVIATION ADMIN., WEIGHT-SHIFT CONTROL AIRCRAFT FLYING HANDBOOK 4 (2008).

97. *Tallest Buildings*, COUNCIL ON TALL BUILDINGS AND URB. HABITAT, <https://www.skyscrapercenter.com/buildings> [perma.cc/K7XN-TKJB].

98. § 91.119(c). For an explanation of why this category covers most parts of the country, see Walter S. King, *The Fifth Amendment Takings Implications of Air Force Aircraft Overflights and the Air Installation Compatible Use Zone Program*, 43 A.F. L. REV. 197 (1997); Troy A. Rule, *Airspace in an Age of Drones*, 95 B.U. L. REV. 155, 166–167, 166 n.59 (2015).

99. See, e.g., *Matson v. United States*, 171 F.Supp. 283, 286 (Ct. Cl. 1959); *Mills v. Orcas Power & Light Co.*, 355 P.2d 781, 789 (Wash. 1960); see also Colin Cahoon, Comment, *Low Altitude Airspace: A Property Rights No-Man's Land*, 56 J. AIR L. & COM. 157, 176–77 (1990).

100. See Cahoon, *supra* note 99, at 177.

101. This Note discusses interpreting and applying Section 91.119 in Section III.C.

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

rule is not binding on states, but it is persuasive authority, and it is reflected in the Restatement of Torts.¹⁰³ Some states permit aerial trespass actions beyond the “immediate reaches”¹⁰⁴ (although Section 91.119 would preempt contrary state law allowing trespass actions above the “navigable airspace” line¹⁰⁵).

Third, *Causby* suggests that there must be “interference with actual use” for aerial trespass to be actionable.¹⁰⁶ The “interference with actual use” requirement is similarly not binding on states, although many states have adopted it.¹⁰⁷ It is also not clear that it is an independent element, as opposed to a factor intertwined with the “immediate reaches.” For example, the Restatement of Torts explains that the extent of the “immediate reaches” is defined, at least in part, by whether the trespass results in “interference with actual use.”¹⁰⁸ Claimants often satisfy the requirement by showing that the aerial trespass caused excessive noise.¹⁰⁹

2. The Ambiguous Middle Area

There is a subsection of airspace above land, the “immediate reaches,” in which aerial trespass is actionable, though the boundary of this zone is not precisely defined. It is also clear that surface owners have no property interest in the navigable airspaces which Congress has placed in the public domain, usually airspace above 500 feet where all aircraft have a right of access. What about the zone in between? No one seems to know.¹¹⁰

Some dicta in *Causby* seem to suggest that everything beyond the “immediate reaches” is in the public domain,¹¹¹ and thus, there is no ambiguous middle zone. But this may just be dicta concerning how North Carolina state law would apply; otherwise it would contradict other parts of the opinion which

103. RESTATEMENT (SECOND) OF TORTS § 159 (AM. L. INST. 1965); *see also* § 158 cmt. i.

104. For example, North Dakota does not have an explicit “immediate reaches” requirement for aerial trespass actions. *See Peterson v. United States*, 673 F.2d 237 (8th Cir. 1982) (applying North Dakota law and concluding that a B-52 flying between 75 and 400 feet above claimant’s property constituted a trespass).

105. *See Singer v. City of Newton*, 284 F. Supp. 3d 125, 131–32 (D. Mass. 2017).

106. In *Causby*, the Court held the “interference with actual use” requirement was met by showing that the low-altitude airplane flights produced startling noise and glare from airplanes’ bright lights, which caused respondents to suffer sleep deprivation, and forced them to abandon their chicken-farming business on the land because the startling noise caused 150 chickens to kill themselves by flying and crashing into walls. *Causby v. United States*, 328 U.S. 256, 259, 266–67 (1946).

107. *See e.g., Henthorn v. Oklahoma City*, 453 P.2d 1013 (Okla. 1969).

108. RESTATEMENT (SECOND) OF TORTS § 159 cmt. I.

109. *See e.g., Henthorn*, 453 P.2d at 1014, 1016; *Griggs v. Allegheny Cnty.*, 369 U.S. 84 (1962); *Powell v. Cnty. of Humboldt*, 166 Cal. Rptr. 3d 747 (Ct. App. 2014).

110. Commentators have noted the uncertainty associated with low-altitude air rights following *Causby*. *See e.g., Rule, supra* note 98, at 168–69; *Cahoon, supra* note 99, at 198.

111. *Causby*, 328 U.S. at 266 (“The airspace, apart from the immediate reaches above the land, is part of the public domain.”).

make clear that only the airspace above the FAA-prescribed minimum safe altitudes is in the public domain.¹¹² In fact, on remand, the lower court in *Causby* suggested that a surface owner maintains a property interest in all airspace below the minimum levels set by regulation.¹¹³

Between *Causby* and the federal aviation statutes and regulations in effect today, it may appear as though there is no bright line demarcating navigable airspace in the public domain.¹¹⁴ The location of the boundary seems to vary depending on *at least* (1) the type of aircraft flown (e.g., whether it's a helicopter or a fixed-wing aircraft),¹¹⁵ (2) whether the aircraft is taking off or landing versus in mid-flight,¹¹⁶ (3) the height of the tallest "obstacle" within 2,000 feet,¹¹⁷ and (4) in "sparsely populated areas," the presence of a "person, vessel, vehicle, or structure."¹¹⁸ For example, a homeowner could extend the navigable airspace boundary above her land by building an "obstacle" like a tall tower on her land.¹¹⁹ In the past, there were even more relevant factors.¹²⁰ And of course, the entire regulatory scheme is subject to new rules that the FAA may promulgate.

These complications notwithstanding, in the typical "other than congested" area where the FAA prescribed minimum safe altitude is 500 feet: (a) trespass above 500 feet in altitude is never actionable; and (b) trespass within 50 feet is almost certainly actionable (as it almost certainly causes "interference with actual use"). In airspace between 50 and 500 feet, whether trespass is actionable depends on a fact-specific inquiry about whether the trespass was

112. *Id.* at 260 ("And 'navigable air space' is defined as 'airspace above the minimum safe altitudes of flight prescribed by the Civil Aeronautics Authority.'") (quoting 49 U.S.C. § 180 (1940)); *id.* at 263–64 ("The navigable airspace which Congress has placed in the public domain is 'airspace above the minimum safe altitudes of flight prescribed by the Civil Aeronautics Authority.'") (quoting 49 U.S.C. § 180 (1940)).

113. *Causby v. United States*, 75 F. Supp. 262, 263–64 (Ct. Cl. 1948) (explaining that the minimum safe altitude that applied over the *Causby* farm was 300 feet and that government trespasses between 83 and 365 feet in altitude were actionable).

114. But this Note in fact proposes a bright-line rule. See discussion *infra* Section III.B.

115. See 14 C.F.R. § 91.119(d) (2021).

116. After *Causby*, Congress redefined "navigable airspace" to include airspace that was "needed to insure safety in take-off and landing of aircraft." Federal Aviation Act of 1958, Pub. L. No. 85-726, § 101(24), 72 Stat. 731, 739.

117. 14 C.F.R. § 91.119(b).

118. *Id.* Another complicating factor is the difficulty that sometimes exists in determining whether a given area is "congested," "other than congested," or "sparsely populated." See *infra* text accompanying notes 182–186.

119. But there are limits to what an owner may build, including 14 C.F.R. § 77.9 (2021) (requiring builders to file notice with the FAA for any planned construction that protrudes more than 200 feet above ground level), § 77.17 (providing that construction more than 499 feet above ground level is considered an "obstruction"), and local zoning restrictions.

120. See, e.g., *Causby v. United States*, 328 U.S. 256, 263 (noting a day/night discrepancy in minimum safe altitude for carriers).

within the “immediate reaches” (whatever this may mean), and/or whether it “interfere[d] with actual use.”¹²¹

3. Limited Role for State Law

The federal law ensures a limited role for state law concerning aircraft access to airspace. The FAA interprets the federal aviation regulations as preempting state law from regulating aviation safety or navigable airspace.¹²² The principles of conflict preemption apply whenever states and local governments attempt to enact regulations in parallel with FAA regulations.¹²³ But state law does matter to some extent because it provides the cause of action for trespass actions.¹²⁴ After all, property law is traditionally a creature of state law.¹²⁵ And there are some differences between states’ definitions of the tort of trespass.¹²⁶

But the Court has said that the specific laws of individual states should not govern the reach of the Fourth Amendment, because then there would be a different Fourth Amendment in each state.¹²⁷ So while state property law

121. See RESTATEMENT (SECOND) OF TORTS § 159 cmt. 1 (AM. L. INST. 1965).

122. See, e.g., Operation of Small Unmanned Aircraft Systems over People, 88 Fed. Reg. 4314, 4359 (proposed Feb. 13, 2019) (to be codified at 14 C.F.R. pts. 11, 21, 43, 107) (“[M]unicipalities do not have authority to enact operational restrictions on aviation safety or the efficiency of the navigable airspace, including regulation of unmanned aircraft flight altitude, flight paths or operational bans.”).

123. See, e.g., *Singer v. City of Newton*, 284 F. Supp. 3d 125 (D. Mass. 2017) (invalidating on account of preemption by FAA regulations a City of Newton ordinance requiring (1) registration of drone aircraft with the city, (2) banning drone flight below 400 feet without surface owner’s permission, and (3) requiring drones to be within the visual line of sight of the operator).

124. Trespass concerns property law, which is traditionally a matter of state law. For example, *Causby* looked to North Carolina state law to “confirm” its conclusion, and analogized to the Takings Clause, explaining that “while the meaning of ‘property’ as used in the Fifth Amendment was a federal question, ‘it will normally obtain its content by reference to local law.’” *Causby*, 328 U.S. at 266. See also *Henthorn v. Oklahoma City*, 453 P.2d 1013 (Okla. 1969).

125. See Operation and Certification of Small Unmanned Aircraft Systems, 81 Fed. Reg. 42064, 42194 (June 28, 2016) (to be codified at 14 C.F.R. pts. 21, 43, 61, 91, 101, 107, 119, 133, 183).

126. See Rule, *supra* note 98, at 188 (“Only a law providing for exclusion rights all the way up to the navigable airspace line would ensure that the sole overflights over which landowners had no control would continue to be high-altitude flights by FAA-licensed pilots.”). At least four states have enacted statutes clarifying surface owners’ right to exclude drones from the airspace above their property up to the altitude at which navigable airspace begins. LA. STAT. ANN. § 14:63(B)-(C) (2022); NEV. REV. STAT. § 493.103 (2022) (below 250 feet); OR. REV. STAT. § 837.380 (2015); UTAH CODE ANN. § 76-6-206 (LexisNexis 2022).

127. See *California v. Greenwood*, 486 U.S. 35, 43 (1988) (rejecting the argument that a California state law establishing a right to privacy in one’s garbage creates a reasonable expectation of privacy under the Fourth Amendment and explaining that “whether or not a search is reasonable within the meaning of the Fourth Amendment” does not depend “on the law of the particular State in which the search occurs”). *But see* Baude & Stern, *supra* note 10 (advocating for a “positive law” theory of the Fourth Amendment in which the reach of Fourth Amendment would necessarily depend on the individual laws of each state).

principles may inform courts' understanding of the reach of the Fourth Amendment, differences in property law between individual states are not significant.

III. AERIAL TRESPASS AND THE FOURTH AMENDMENT

This Note argues that aerial property rights can be analyzed with a two-tiered approach: (1) the "lower zone" below an area's prescribed minimum safe altitude, and (2) the "upper zone" above the applicable minimum safe altitude. Aerial trespass may be actionable in the "lower zone," but is never actionable in the "upper zone." Section III.A proposes an aerial trespass test: a Fourth Amendment search never occurs in the "upper zone," but *presumptively* occurs when a state actor intrudes into the "lower zone" with the intent of obtaining information. Section III.B applies the test to several prominent aerial surveillance cases and highlights where this test would lead to different outcomes. Section III.C addresses counterarguments to the aerial trespass test. And Section III.D explains the advantages of the aerial trespass test against the current *Katz* approach.

A. *The Fourth Amendment Aerial Trespass Test*

1. Proposal

Reconciling the aerial property rights from *Causby* and *Hinman* with *Jones*'s Fourth Amendment physical intrusion test, this Note proposes the following trespass-based Fourth Amendment test for aerial surveillance:

1. Lower zone: A Fourth Amendment search presumptively occurs when a state actor intrudes into the airspace above a home or other constitutionally protected real property below the unambiguous public domain with the intent of obtaining information. The state may rebut this presumption by showing that the frequency of aerial intrusions of the same nature was so great as to amount to an implied easement or taking.
2. Upper zone: The Fourth Amendment is not implicated when a state actor is lawfully within the unambiguous public domain. The unambiguous public domain is defined as navigable airspace above the minimum safe altitudes defined by FAA regulations in which all aircraft may be lawfully present.

No Fourth Amendment claim would be cognizable in the "upper zone."¹²⁸ In most areas classified as "other than congested," this zone begins at 500 feet.¹²⁹ In "sparsely populated" areas, there is no minimum, but aircraft must

128. There is near-consensus that aerial trespass is not actionable in tort in the unambiguous public domain. See Rule, *supra* note 98, at 167–68; King, *supra* note 98, at 202.

129. 14 C.F.R. § 91.119(c) (2022).

avoid coming within 500 feet of any person, vessel, vehicle, or structure.¹³⁰ In “congested areas,” the unambiguous public domain begins at 1,000 feet above the highest obstacle within a radius of 2,000 feet¹³¹—beginning, for example, at 2,776 feet around the World Trade Center in Manhattan.

The contours are less clear in the lower zone. There is near-consensus that aerial trespass is actionable within the “immediate reaches,” which consists of “as much space above the ground as [a landowner] can occupy or use in connection with the land.”¹³² In *Causby*, the airplanes flying at eighty-three feet above the plaintiffs’ land regularly came within sixty-seven feet of the house, sixty-three feet of the barn, and eighteen feet of the highest tree, and this was held to be within the “immediate reaches.”¹³³ A trespass fifty-feet high “which interferes with actual use” would likely be included, while a trespass within 150 feet “may present a question of fact” as to whether it is also included.¹³⁴

What about the space above the “immediate reaches” but below the unambiguous public domain? This would include, for example, a fixed-wing aircraft flying at a height between 200 and 500 feet in an “other than congested” area, a helicopter flying at 800 feet in a congested area, or a fixed-wing aircraft flying at 300 feet over a lone structure in a “sparsely populated” area.¹³⁵ This “middle space” may not exist in some areas, such as sparsely-populated areas, where no FAA minimum safe altitude applies.¹³⁶ But where it does exist, the scope of landowners’ property rights is the most uncertain.¹³⁷ This Note avoids such ambiguity by proposing that a Fourth Amendment search would presumptively occur in the entirety of the “lower zone.” But out of an abundance of caution, and to safeguard the workability of an aerial trespass test, this proposal would allow the state to rebut the presumption upon showing that the federal government has placed the airspace in the public domain,¹³⁸ or that aerial intrusions occur frequently enough to give rise to an implied easement

130. *Id.* Compare with the open fields doctrine. See *supra* notes 39–40 and accompanying text.

131. § 91.119(b).

132. *E.g.*, *United States v. Causby*, 328 U.S. 256, 264 (1946).

133. *Id.* at 258, 264.

134. RESTATEMENT (SECOND) OF TORTS § 159 cmt. i (AM. L. INST. 1965).

135. Although the FAA does not prescribe a minimum safe altitude over sparsely populated areas, the FAA regulation still requires that aircraft avoid coming within 500 feet of any structure. See *id.*; § 91.119(b). It is not clear whether the 500-foot distance requirement functions as a minimum safe altitude over such a structure within the meaning of *Causby*.

136. See *supra* note 130 and accompanying text.

137. See Rule, *supra* note 98, at 168–69; Cahoon, *supra* note 99, at 198.

138. See, e.g., *Griggs v. Allegheny Cnty.*, 369 U.S. 84, 86–90 (1962). But see *State v. Little*, 918 N.E.2d 230, 236–37 (Ohio Ct. App. 2009), *appeal dismissed*, 928 N.E.2d 735 (Ohio 2010) (explaining that access to airspace around airports is more highly regulated such that surface owners below have a greater expectation of privacy).

or a taking.¹³⁹ A court is more likely to find an implied easement at higher altitudes.

2. Evoking *Sabo*

This Note is not the first proposal of a two-tiered approach to analyzing aerial surveillance based on FAA-prescribed minimum safe altitudes. In *People v. Sabo*, a San Diego County Sheriff's Department helicopter circled several times above a greenhouse in a defendant's backyard at an elevation of 400 to 500 feet and identified marijuana plants within the greenhouse.¹⁴⁰ The California Court of Appeal held that the helicopter surveillance was a Fourth Amendment search.¹⁴¹ The court distinguished *Ciraolo* and *Dow Chemical*, explaining that unlike the helicopter in *Sabo*, the aerial surveillance in both of those cases took place within navigable airspace.¹⁴² The court observed that its approach created "a two-tiered concept": within navigable airspace, the Fourth Amendment is categorically not implicated per *Ciraolo* and *Dow Chemical*; but below navigable airspace, a court must conduct a "traditional inquiry into reasonable privacy expectation."¹⁴³

The Florida Supreme Court relied on *Sabo* to reach its decision in *Riley*.¹⁴⁴ But in a fractured opinion, the United States Supreme Court reversed the Florida Supreme Court.¹⁴⁵ Given this fracture, it is unclear whether any aspect of the *Sabo* approach remains good law today.

But there is one key difference between *Sabo* and this Note's proposal: *Sabo* was grounded in the language of *Katz*. Specifically, *Sabo* explained that, while aerial surveillance in navigable airspace does not implicate the Fourth Amendment because observations made from navigable airspace are in "plain view," aerial surveillance below navigable airspace "continues to call for traditional inquiry into reasonable privacy expectation."¹⁴⁶ By contrast, this Note presumes that aerial surveillance conducted at altitudes below navigable airspace constitutes a Fourth Amendment search. Unlike in *Sabo*, factors such as

139. *Contra Florida v. Riley*, 488 U.S. 445, 453–55 (1989) (O'Connor, J., concurring) (placing the burden on the target of the search to show that such intrusions were *not* sufficiently frequent).

140. *People v. Sabo*, 230 Cal. Rptr. 170, 170–71 (Ct. App. 1986), *cert. denied*, 481 U.S. 1058 (1987).

141. *Id.* at 176.

142. *Id.* at 174–75.

143. *Id.* at 175.

144. *Riley v. State*, 511 So. 2d 282, 288 (Fla. 1987), *rev'd*, 488 U.S. 445 (1989). For factual background, see *supra* Section I.A.2.

145. *Riley*, 488 U.S. at 445.

146. *Sabo*, 230 Cal. Rptr. at 170, 175 ("Our reading of *Ciraolo* and *Dow [Chemical]* results in a mechanical application of the rule there announced—the naked-eye view from navigable airspace does not offend the Fourth Amendment, whatever the circumstances of the view.").

intrusiveness, excessive sound, hazard to people or property, and a helicopter's ability to perform "aerial acrobatics" are irrelevant.¹⁴⁷

3. "Interference with Actual Use"?

For aerial trespass to be actionable in tort, a plaintiff must generally show that the trespass "interfere[d] with actual use."¹⁴⁸ The most recent Supreme Court case alluding to the "interference with actual use" requirement—*Florida v. Riley*—suggested that "interfere[nce] with respondent's normal use" of their property would be necessary for aerial trespass to implicate the Fourth Amendment.¹⁴⁹ This suggestion, however, was dictum in a plurality opinion.

Moreover, Fourth Amendment law is not strictly tied to trespass. Even in *Jones*, analogy to trespass served as a proxy for ascertaining when the Fourth Amendment was triggered. While a suit for trespass to chattels requires "some actual damage to the chattel,"¹⁵⁰ *Jones* held that affixing a GPS tracker onto the defendant's car was enough to constitute a Fourth Amendment search, even though the tracker caused no damage to the car and the defendant was not aware that the tracker was installed.¹⁵¹

In tort law, an "interference with actual use" requirement in an aerial trespass claim (or "actual damage" in a trespass-to-chattels claim) makes sense. It reflects the policy judgment that only cases in which damages are quantifiable are important enough to merit the attention of courts.¹⁵² The logic of this requirement in *Causby* is similar.¹⁵³ For purposes of the Fourth Amendment, this rationale is inapposite. The harm caused by a Fourth Amendment violation is significant even when actual damages cannot be quantified. The harm inflicted is the state actor's intentional invasion of a person's privacy, not the incidental property damage that a search may cause.

The "interference with actual use" requirement has become an important factor in lower courts, and there are many cases where such a requirement is met,¹⁵⁴ but the requirement would severely limit the applicability of the Fourth

147. *Contra id.* at 175.

148. *See supra* note 105–107 and accompanying text.

149. 488 U.S. 445, 452 (1989) (plurality opinion) ("Neither is there any intimation here that the helicopter interfered with respondent's normal use of the greenhouse or of other parts of the curtilage. As far as this record reveals . . . there was no undue noise, and no wind, dust, or threat of injury.").

150. *United States v. Jones*, 565 U.S. 400, 419 n.2 (2012) (Alito, J., concurring).

151. *Id.* at 411 (majority opinion).

152. *See* RESTATEMENT (SECOND) OF TORTS § 218 cmt. e (AM. L. INST. 1965); W. PAGE KEETON, DAN B. DOBBS, ROBERT E. KEETON & DAVID G. OWEN, PROSSER AND KEETON ON THE LAW OF TORTS § 14, at 87 (W. Page Keeton ed., 5th ed. 1984); *cf.* NEV. REV. STAT. § 493.103(1) (2015) (requiring plaintiff to show multiple instances of aerial trespass).

153. *See United States v. Causby*, 328 U.S. 256, 261 (1946) (suggesting that the interference with the actual use requirement is motivated by a desire to prevent frivolous lawsuits).

154. *E.g.*, *Commonwealth v. Oglialoro*, 579 A.2d 1288 (Pa. 1990); *People v. Pollock*, 796 P.2d 63 (Colo. App. 1990); *State v. Davis*, 360 P.3d 1161 (N.M. 2015).

Amendment to searches conducted by minimally invasive, small, unmanned aircraft as in *Maxon*. When a state actor commits an aerial trespass *with the intent to obtain information* from within the trespassed space, that interference should be enough.¹⁵⁵

B. *The Aerial Trespass Test Applied*

Many, if not most, cases would come out the same way under this Note's aerial trespass test as under *Ciraolo* and *Dow Chemical*. But in the trickiest borderline cases, the aerial trespass test will promote regularity in the law and eliminate the problem of arbitrary and unpredictable outcomes. This Section applies the aerial trespass test to the Supreme Court's aerial surveillance cases and to *Maxon*.

1. *Ciraolo* and *Dow Chemical*

Ciraolo would come out the same way under the aerial trespass test. In *Ciraolo*, law enforcement used a fixed-wing aircraft to fly over the defendant's house at an altitude of 1,000 feet (within navigable airspace) to surveil his backyard.¹⁵⁶ Therefore, *Ciraolo* would be an easy case involving surveillance from the unambiguous public domain. The aircraft was within navigable airspace at a level that would have been accessible to all aircraft, so no Fourth Amendment search occurred. *Dow Chemical* would come out the same way too. Recall that in *Dow Chemical*, the EPA used an airplane to photograph an industrial plant from well within navigable airspace.¹⁵⁷ No Fourth Amendment search occurred.

2. *Riley*

Florida v. Riley is a more challenging case. Under the aerial trespass test, a Fourth Amendment search occurred. In *Riley*, police conducted helicopter surveillance of the defendant's backyard from a height of 400 feet.¹⁵⁸ At 400 feet, the helicopter might not have committed an actionable trespass in tort (since aerial trespass is generally actionable only in the "immediate reaches,"

155. Cf. *People v. Sneed*, 108 Cal. Rptr. 146, 150–51 (Ct. App. 1973); *Kyllo v. United States*, 533 U.S. 27, 27 (2001); *Payton v. New York*, 445 U.S. 573, 586 n.25 (1980) ("It is accepted, at least as a matter of principle, that a search or seizure carried out on a suspect's premises without a warrant is *per se* unreasonable . . .").

156. *California v. Ciraolo*, 476 U.S. 207, 209, 211 (1986). *Ciraolo* was set in Santa Clara, California, a dense suburb located immediately west of San Jose. This location may be a "congested area," 14 C.F.R. § 91.119 (2021), which would set the boundary of navigable airspace for the location in question at 1,000 feet above the highest obstacle within a 2,000-foot radius. See, e.g., *Hinson v. Traub*, N.T.S.B. Order No. EA-4188, 1994 WL 267753 (May 27, 1994). Just as plausibly, the location could be an "other than congested" area where navigable airspace would go as low as 500 feet. In either case, flight at 1,000 feet would have been within navigable airspace.

157. See *supra* note 17 and accompanying text.

158. *Florida v. Riley*, 488 U.S. 445, 448 (1989) (plurality opinion).

which generally goes no higher than 100 to 150 feet). And the helicopter might have been lawfully operating at 400 feet under an FAA rule exempting helicopters from minimum safe altitude requirements.¹⁵⁹ But the helicopter was nonetheless below navigable airspace and, therefore, in the lower zone.¹⁶⁰

This creates a tricky issue. If we accept (a) that Congress has allowed the FAA's minimum safe altitudes to define navigable airspace, which Congress then puts in the public domain, and (b) that property interests in air extend up only to the point at which the public domain begins, then what do we do when the FAA prescribes minimum safe altitudes on a technology-by-technology basis? Section 91.119(d)(1) exempts helicopters and some other types of aircraft from minimum safe altitudes.¹⁶¹ One might argue that this regulation effectively prescribes a minimum safe altitude of zero feet for helicopters and, per *Causby*, that the helicopter flying at any altitude would be in the unambiguous public domain.

But as this Note has shown, Section 91.119 is best understood as setting clear lines defining the public domain as the minimum safe altitudes above which *all* aircraft are allowed.¹⁶² The special permission granted to helicopters and other aircraft to fly lower is best understood as a special-use easement.¹⁶³ The Court has often described regulations which limit a property owner's right to exclude as imposing a "servitude" or an "easement."¹⁶⁴ "An easement creates a nonpossessory right to enter and use land in the possession of another" for specified purposes or uses "and obligates the possessor not to interfere with the uses authorized by the easement."¹⁶⁵ In *Causby* itself, the Court

159. See 14 C.F.R. § 91.119(d).

160. The Court noted that "Riley lived in a mobile home located on five acres of rural property," *Riley*, 488 U.S. at 445, 448, 451 n.3, likely placing him in an "other than congested area[]," where navigable airspace begins at 500 feet.

161. Helicopters, powered parachutes, and weight-shift-control aircraft are exempt from the minimum safe altitudes set in 14 C.F.R. § 91.119(b)-(c). 14 C.F.R. § 91.119(d).

162. See *supra* Section II.C.1. This understanding would alleviate Justice Brennan's concern over the hypothesized "miraculous tool" which is "*capable of hovering just above* an enclosed courtyard or patio without generating any noise, wind, or dust," which police may one day use for surveillance. *Riley*, 488 U.S. at 462 (Brennan, J., dissenting) (emphasis added). Justice Brennan wondered: "Suppose . . . that the FAA regulations remained unchanged, so that the police were undeniably 'where they had a right to be.' Would today's plurality continue to assert that [the Fourth Amendment] was not infringed by such surveillance?" *Id.* at 462-63.

163. When the government takes an easement across private property like this, it ordinarily triggers a compensable taking if it causes a quantifiable decrease in value. The Takings Clause of the Fifth Amendment is implicated when the government takes possession of property, even without formally acquiring title to it. See *Cedar Point Nursery v. Hassid*, 141 S. Ct. 2063, 2071 (2021) (citing *United States v. Pewee Coal Co.*, 341 U.S. 114, 115-117 (1951) (plurality opinion)).

164. *Id.* at 2073.

165. RESTATEMENT (THIRD) OF PROPERTY: SERVITUDES § 1.2 (AM. L. INST. 2000) (emphasis added).

held that the frequent overflights over the Causby farm at low altitudes indicated that “a servitude has been imposed upon the land,”¹⁶⁶ and remanded to the lower court to define the scope of the easement.¹⁶⁷ Further, accepting a theory that certain segments of navigable airspace are in the public domain only for certain types of aircraft conflicts with Congress’s intent that “the public right of flight in the navigable air space” be comparable to the “public easement of navigation in the navigable waters,”¹⁶⁸ which does not vary by the type of watercraft used.

And if the helicopter exception is a public special-use easement, the helicopter in *Riley* exceeded any reasonable scope of that easement. Under traditional property principles, a court may enjoin the misuse of an easement without the servient owner showing damage.¹⁶⁹ Any public easement created in Section 91.119(d) would be for the purpose of navigation.¹⁷⁰ The helicopter in *Riley* went beyond simply cutting across defendant’s airspace; it hovered for an extended period at a low altitude to spy on the defendant’s backyard.¹⁷¹

3. *Maxon*

Finally, a court applying the aerial surveillance test in *Maxon* would conclude that a Fourth Amendment search had occurred. The record did not indicate the exact altitude at which the drone photos were taken, but the drone operator stated in an affidavit that he “maintained an altitude of less than 400 feet.”¹⁷² Additionally, the record indicates that defendant *Maxon* was in his backyard when he heard a drone “flying directly over his head.”¹⁷³ Given that there were people and structures around, the area was not “sparsely populated” but at least “other than congested,” so navigable airspace in the area

166. *United States v. Causby*, 328 U.S. 256, 266–67 (1946).

167. *See id.* at 267–68 (remanding to lower court to determine “whether the easement taken was temporary or permanent”); *see also* *Kaiser Aetna v. United States*, 444 U.S. 164, 167, 180 (1979); *Cedar Point Nursery*, 141 S. Ct. at 2074–76 (explaining that CAL. CODE REGS. tit. 8, § 20900(e) (2022) was a “government-authorized invasion[] of property” analogous to an easement).

168. H.R. REP. NO. 69-572, at 10 (1926).

169. *See, e.g., Mobley v. Saponi Corp.*, 212 S.E.2d 287 (Va. 1975); *see also* CHARLES S. RHYNE, AIRPORTS AND THE COURTS 156 (1944) (characterizing misuse of an easement as “unreasonable interference”).

170. Additionally, FAA rules require helicopters flying below the minimum safe altitudes to comply with “any routes or altitudes specifically prescribed for helicopters by the FAA.” 14 C.F.R. § 91.119(d)(1) (2022). This is consistent with the more narrowed scope of a special-use easement. *See also supra* note 163.

171. *See Cahoon, supra* note 99, at 159, 164 (explaining “public easement theory”); *see also* RESTATEMENT (THIRD) OF PROPERTY: SERVITUDE) § 4.10 cmts. d, f (AM. L. INST. 2000) (explaining how courts determine when someone’s use of a servitude has exceeded the scope or purpose of the servitude).

172. *Long Lake Twp. v. Maxon*, 970 N.W.2d 893, 897 (Mich. Ct. App. 2021), *vacated*, 973 N.W.2d 615 (Mich. 2022).

173. Brief for Appellant at 2, *Maxon*, 970 N.W.2d 893 (No. 349230).

begin at no less than 500 feet.¹⁷⁴ This is enough for a court to conclude that the drone was always below navigable airspace, and that the drone did in fact cross the line into the airspace above Maxon's property.

C. Addressing Counterarguments

The *Maxon* majority lodged an important critique of applying the *Jones* trespass test to aerial surveillance: “[W]e think there is little meaningful distinction for present purposes between ‘just inside . . .’ and ‘just outside the property line.’”¹⁷⁵ While this critique illustrates how the rigid formality of *Jones* might limit its usefulness, it should not detract from its utility in those cases in which it works well. Also, the aerial trespass test may help to better inform reasonable expectations of privacy in aerial surveillance even under an application of *Katz*. It may contribute to establishing the norm that aerial surveillance conducted at altitudes below FAA-specified minimum safe altitudes constitutes a Fourth Amendment search, even when no technical aerial trespass has occurred, by legitimating a reasonable expectation of privacy in airspace below the public domain line.¹⁷⁶

Some scholars also object to the use of FAA regulations to define the reach of the Fourth Amendment. For example, Professor Orin Kerr has argued,

Consider the FAA regulations analyzed in *Florida v. Riley*, the helicopter fly-over case. The FAA presumably drafted those regulations to minimize noise and deter accidents, not to limit the police. Whether the police happened to fly over or under FAA airspace limits has no significant connection to whether particular police flyovers are reasonable only if justified by a warrant.¹⁷⁷

Kerr's presumption that the FAA drafted the regulations in Section 91.119 to “minimize noise and deter accidents” is not entirely correct. As this Note has explained, Congress intended the FAA to prescribe minimum safe altitudes, at least in part, to define the scope of property rights in air.¹⁷⁸ FAA-prescribed minimum safe altitudes define “navigable airspace” in the public domain and set the boundaries at which surface owners' property interests in airspace end.¹⁷⁹ The Supreme Court has confirmed this interpretation.¹⁸⁰ And,

174. See 14 C.F.R. § 91.119(c) (2010).

175. *Maxon*, 970 N.W.2d at 905.

176. Cf. *People v. Sabo*, 230 Cal. Rptr. 170, 174–75 (Ct. App. 1986).

177. Kerr, *supra* note 10, at 533.

178. *Supra* notes 88–89.

179. 49 U.S.C. § 40102(a)(32) (“[N]avigable airspace’ means airspace above the minimum altitudes of flight prescribed by regulations under this subpart . . .”).

180. *United States v. Causby*, 328 U.S. 256, 263–64 (1945).

as this Note has explained, there is nothing unusual about looking to property interests to define the reach of the Fourth Amendment.¹⁸¹

Another drawback of the aerial trespass test is that courts will need to apply the FAA regulations in Section 91.119 to determine the minimum safe altitude in a given area. The regulations provide a loose set of standards; it may be difficult to determine whether a given area is, for example, an “other than congested area[]”¹⁸² or a “congested area.”¹⁸³ In fact, Section 91.119(b) circularly uses the phrase “congested area” to *define* “congested area.”¹⁸⁴ But this difficulty is not insurmountable. In many cases, a Section 91.119 zone determination will not be required at all because the surveillance will be below navigable airspace regardless of the zone.¹⁸⁵ And even when a Section 91.119 zone adjudication is required, existing case law shows that such adjudications are well within judicial competence.¹⁸⁶ Cases such as *Claassen v. City & County of Denver*¹⁸⁷ and *Mickalich v. United States*¹⁸⁸ show that courts can do this with the ordinary tools of statutory interpretation.

As a final note, there are forms of aerial surveillance which would not result in a Fourth Amendment search under the aerial trespass test but should nonetheless implicate the Fourth Amendment. For example, the ARGUS im-

181. See discussion *supra* notes 11, 50–51 and accompanying text.

182. 14 C.F.R. § 91.119(c) (2010).

183. *Id.* § 91.119(b).

184. *Id.*

185. For example, in *Maxon*, where aerial surveillance took place below 400 feet, it should make no difference whether the surveillance took place in a “congested” area (navigable airspace beginning at 1,000 feet) or an “other than congested” area (beginning at 500 feet). In either case, surveillance at or below 400 would be in the “lower zone,” below the public domain. *Long Lake Twp. v. Maxon*, 970 N.W.2d 893, 897 (Mich. Ct. App. 2021), *vacated*, 973 N.W.2d 615 (Mich. 2022). The presence of homes and people makes it clear that surveillance was not in a “sparsely populated” area. See also *McCarran Int’l Airport v. Sisolak*, 137 P.3d 1110, 1119 (Nev. 2006) (finding that the issue of whether claimant’s land was in a “congested” or “other than congested” area was irrelevant because it involved airspace below 500 feet that would be below navigable airspace in either case).

186. A large body of National Transportation Safety Board (NTSB) adjudications provides guidance. *E.g.*, *Hinson v. Traub*, N.T.S.B. Order No. EA-4188, 1994 WL 267753 (May 27, 1994) (concluding that an aircraft flying over Interstate 5 in Los Angeles on a late Saturday afternoon, with moderate traffic in each lane, was flying over a “congested” area per Section 91.119(b); *Administrator v. Dutton*, N.T.S.B. Order No. EA-3204, 7 N.T.S.B. 521 (1990) (concluding that moderate traffic on a highway at 12:55 p.m. made the highway a “congested area”). FAA guidance documents also help. *E.g.*, *Operation and Certification of Small Unmanned Aircraft Systems*, 81 Fed. Reg. 42064, 42115 (June 28, 2016).

187. 30 P.3d 710 (Colo. App. 2000) (dispute over whether plaintiffs were in a “congested” or “other than congested” area); see also *Thompson v. City & Cnty. of Denver*, 958 P.2d 525, 526–28 (Colo. App. 1998) (concluding that the land in question was an “other than congested area” because at trial, plaintiff presented no evidence that their property “lies in anything other than an uncongested area”).

188. No. 05-72276, 2007 WL 1041202 (E.D. Mich. Apr. 5, 2007) (dispute over whether plaintiffs were in a “congested” or “other than congested” area).

aging system, developed by the Department of Defense, is deployed at an altitude above 17,000 feet and uses a high-powered sensor to generate a detailed, interactive map of the ground below in real time.¹⁸⁹ It can provide a persistent video feed twenty-four hours a day, seven days a week.¹⁹⁰ At 17,000 feet, there is no question that this technology would be comfortably within navigable airspace and would not implicate the aerial trespass test. But use of this technology might still implicate the Fourth Amendment under a *Katz*-based theory, such as the *Kyllo* standard¹⁹¹ or the mosaic theory of the Fourth Amendment.¹⁹² The aerial trespass test is also inapplicable to aerial surveillance at any altitude over public property, like streets and sidewalks, but such surveillance may also be covered by the mosaic theory of the Fourth Amendment.¹⁹³

D. *Advantages of the Aerial Trespass Approach*

Some scholars and judges have noted that the reemergence of the *Jones* trespass-based test has done little to change Fourth Amendment law under *Katz*. Justice Kagan argued in her concurring opinion in *Florida v. Jardines* that the Court could have arrived at the same conclusion under an application of *Katz*, even though she joined the Court's opinion applying a trespass-based

189. Ryan Gallagher, *Could the Pentagon's 1.8 Gigapixel Drone Camera Be Used for Domestic Surveillance?*, SLATE (Feb. 6, 2013, 10:14 AM), <https://slate.com/technology/2013/02/argus-could-the-pentagon-s-1-8-gigapixel-drone-camera-be-used-for-domestic-surveillance.html> [perma.cc/8N7C-Y6VF]; See also Talai, *supra* note 6, at 745–46.

190. Talai, *supra* note 6, at 746; *Nova: Rise of the Drones* (PBS television broadcast Jan. 23, 2013), <https://www.pbs.org/wgbh/nova/video/rise-of-the-drones> [perma.cc/YRQ9-6T7H].

191. See *Kyllo v. United States*, 533 U.S. 27, 40 (2001) (“Where . . . the Government uses a device that is not in general public use, to explore details of the home that would previously have been unknowable without physical intrusion, the surveillance is a ‘search’ [triggering the Fourth Amendment].”) The *Kyllo* standard has been criticized for leaving unanswered the question of when a device is “in general public use.” See, e.g., Orin S. Kerr, *The Fourth Amendment and New Technologies: Constitutional Myths and the Case for Caution*, 102 MICH. L. REV. 801, 874 (2004). However, it's fairly clear that ARGUS, developed and used exclusively by the Department of Defense, is not in “general public use” and the level of detail it captures—objects as small as six inches, the clothing people are wearing—is detailed enough to mimic physical intrusion into the curtilage.

192. See *Carpenter v. United States*, 138 S. Ct. 2206, 2217, 2219 (2018) (holding that “individuals have a reasonable expectation of privacy in the *whole* of their physical movements” (emphasis added)); Evan Caminker, *Location Tracking and Digital Data: Can Carpenter Build a Stable Privacy Doctrine?*, 2018 SUP. CT. REV. 411, 437 (“Rather than . . . asking whether public sojourners reasonably expect they are exposing their *discrete* movements to *any* one, . . . the Court in *Carpenter* asked whether the sojourners reasonably expect they are exposing their *entire* set of movements to *any one*, meaning to a single person who sees it all.”).

193. See *Leaders of a Beautiful Struggle v. Balt. Police Dep't*, 2 F.4th 330, 333–34, 341, 346 (4th Cir. 2021) (en banc) (quoting *Carpenter*, 138 S. Ct. at 2218) (holding that the Baltimore city drone surveillance program, which consisted of multiple drones with high resolution cameras capturing up to twelve hours of video a day of over 90% of the city, and maintaining video records for forty-five days, violated citizens' reasonable expectation of privacy, and was like “‘attach[ing] an ankle monitor’ to every person in the city”).

analysis in full.¹⁹⁴ And Justice Alito's concurring opinion in *United States v. Jones* argued that the Court would have been able to reach the same conclusion—that a Fourth Amendment search had occurred—under an application of *Katz*.¹⁹⁵ Professors Matthew Tokson and Ari Ezra Waldman argue that the reemergence of the *Jones* trespass test has “[i]n practice . . . added little to the *Katz* test,” noting that “the Supreme Court cases in which it has been employed may have reached the same outcome under *Katz*.”¹⁹⁶ This conclusion is premature; the Court has applied the trespass test only twice since resurrecting it in 2012, and never in an aerial surveillance case.

This Note does not advocate for a *Jones* aerial trespass test to supplant *Katz* in all aerial surveillance cases. As explained in the previous Section, it may not be desirable in many cases to analyze aerial surveillance under the trespass-based test proposed in this Note. But a *Jones* trespass analysis can lead to a doctrinally straightforward answer without the ambiguities of the *Katz* test.

As lower court decisions show, applying the *Katz* test to aerial surveillance involves inconsistent factors and has led to unpredictable and sometimes conflicting results.¹⁹⁷ In the few lower court cases concluding that an aerial surveillance constituted a Fourth Amendment search, courts applied different factors in different ways. Only *Sneed* discussed the lawfulness of an aircraft's presence in the air, but lawfulness was not critical there.¹⁹⁸ Frequency of flight at a given altitude over a target's property was discussed only in *Pollock*.¹⁹⁹ The disruption or physical damage caused by the surveillance was a critical factor in *Oglialoro*,²⁰⁰ *Pollock*,²⁰¹ and *Davis*.²⁰² Conversely, intent to surveil was a critical factor in *Sneed*,²⁰³ but played no role in *Oglialoro*, *Pollock*, or *Davis*.

Yet in most aerial surveillance cases, courts applying *Katz* have concluded that the aerial surveillance in question does not implicate the Fourth Amendment.²⁰⁴ In *Giancola*, one such typical case, the court held that helicopter surveillance conducted at 100 feet above plaintiffs' property was not a Fourth

194. *Florida v. Jardines*, 569 U.S. 1, 12–16 (2013) (Kagan, J., concurring).

195. Justice Alito also criticized the *Jones* trespass-based test as overly rigid and formalistic. See *United States v. Jones*, 565 U.S. 400, 418–31 (2012) (Alito, J., concurring).

196. Matthew Tokson & Ari Ezra Waldman, *Social Norms in Fourth Amendment Law*, 120 MICH. L. REV. 265, 274 n.46 (2021).

197. See *supra* Section I.A.

198. *People v. Sneed*, 108 Cal. Rptr. 146, 151 & n.1 (Ct. App. 1973).

199. *People v. Pollock*, 796 P.2d 63, 64–65 (Colo. App. 1990) (distinguishing *Florida v. Riley*, 488 U.S. 445, 453 (1989) (O'Connor, J., concurring)).

200. *Commonwealth v. Ogialoro*, 579 A.2d 1288, 1293–94 (Pa. 1990).

201. *Pollock*, 796 P.2d at 64–65.

202. *State v. Davis*, 360 P.3d 1161, 1164, 1169, 1171 (N.M. 2015).

203. *Sneed*, 108 Cal. Rptr. at 150–51.

204. *Dow Chem. Co. v. United States*, 476 U.S. 227 (1986); *Ciraolo v. California*, 476 U.S. 207 (1986); *Florida v. Riley*, 488 U.S. 445 (1989); *Giancola v. W. Va. Dep't of Pub. Safety* 830 F.2d 547 (4th Cir. 1987); *United States v. Breza*, 308 F.3d 430 (4th Cir. 2002); *United States v. Broadhurst*, 805 F.2d 849 (9th Cir. 1986); *People v. Romo*, 243 Cal. Rptr. 801 (Ct. App. 1988);

Amendment search because it comported with FAA regulations.²⁰⁵ This case is one of many examples in direct conflict with the outcomes and reasoning in *Sneed*, *Ogliialoro*, *Pollock*, and *Davis*. An aerial trespass approach would provide a straightforward set of rules that can readily and easily be applied in any aerial flyover case.

Additionally, the aerial trespass test relieves courts of the need to speculate about society's expectations of privacy. Courts applying *Katz* must do so regarding aerial surveillance and often in an undisciplined manner. This often occurs in aerial surveillance cases when courts make findings of fact about the "frequency" of flights at a given altitude. In *Riley*, Justice O'Connor's concurrence asserted, with no evidence, that helicopter traffic 400 feet above Riley's home was sufficiently common, and placed the burden on the target of the aerial surveillance to rebut a presumption that air traffic at a given altitude was sufficiently common if permitted by FAA regulations.²⁰⁶ In *Pollock*, the Colorado Court of Appeals similarly placed the burden on the target of the aerial surveillance to rebut the presumption that the Fourth Amendment was not triggered, but concluded that the defendant provided "ample" evidence to rebut the presumption.²⁰⁷ In *Breza*, the court concluded that the government had "established" that air traffic was sufficiently common—even though that evidence was in the form of law enforcement officers' conclusory testimony that helicopter flights at an altitude of 100 feet over defendant's property "were a regular occurrence."²⁰⁸ The trespass-based approach to aerial surveillance that I propose would involve straightforward legal analysis and lead to more predictable outcomes.

CONCLUSION

The *Jones* trespass test can serve as a useful doctrinal tool for Fourth Amendment analysis of aerial surveillance.²⁰⁹ The benefits of *Jones* are its straightforwardness and simplicity.²¹⁰ While the big obstacle standing in the way of applying *Jones* to aerial trespass has been the uncertainty surrounding the nature of property rights in the air, this Note attempts to provide a framework for making sense of this uncertainty. By contrast, application of *Katz* to

People v. Reynolds, 523 N.E.2d 291 (N.Y. 1988); State v. Vogel, 428 N.W.2d 272 (S.D. 1988); United States v. Wilson, No. 01-5027, 2002 WL 244838 (10th Cir. Feb. 21, 2002).

205. *Giancola*, 830 F.2d at 551. Courts have reached the same conclusion in many other cases. See, e.g., *Breza*, 308 F.3d at 432, 434–35.

206. See 488 U.S. at 455 (O'Connor, J., concurring); accord United States v. Warford, 439 F.3d 836, 843 (8th Cir. 2006); United States v. Boyster, 436 F.3d 986, 992 (8th Cir. 2006).

207. See People v. Pollock, 796 P.2d 63, 65 (Colo. App. 1990).

208. *Breza*, 308 F.3d at 434 & n.3.

209. While Professor Talai dismissed any potential usefulness of the *Jones* trespass test to drone surveillance, Talai, *supra* note 6, at 761–62, he acknowledged that the trespass test might be applicable to drone surveillance at low altitudes. *Id.* at 761 n.221. *Maxon* is one such case.

210. See *id.* at 761.

new technologies is complex and leads to unpredictable outcomes.²¹¹ While the *Maxon* majority had to make speculative assertions about society's expectations of privacy with regard to drone surveillance to reach their conclusion under *Katz*, the *Jones* trespass analysis this Note proposes would lead to the same outcome through more straightforward legal analysis.

As Justice Sotomayor explained in her concurrence in *Jones*, "the trespassory test . . . reflects an irreducible constitutional minimum: When the government physically invades personal property to gather information, a search occurs. The reaffirmation of that principle suffices to decide this case."²¹² This reasoning applies equally to aerial surveillance cases. When aerial surveillance can be analyzed under the test that this Note proposes, which will often be the case, courts can reach easy outcomes and avoid the difficulties of *Katz* altogether.

211. See *id.* at 762–65 (explaining the unpredictability of applying *Katz* to new situations).

212. *United States v. Jones*, 565 U.S. 400, 414 (2012) (Sotomayor, J., concurring).

