



DATE DOWNLOADED: Sun Sep 6 16:58:34 2020

SOURCE: Content Downloaded from [HeinOnline](#)

Citations:

Bluebook 21st ed.

Jonathan Kathrein, The Future of Drones Is the Railroad, 21 INTELL. PROP. & TECH. L. J. 127 (2017).

ALWD 6th ed.

Kathrein, J. ., The future of drones is the railroad, 21(2) Intell. Prop. & Tech. L. J. 127 (2017).

APA 7th ed.

Kathrein, J. (2017). The future of drones is the railroad. Intellectual Property and Technology Law Journal, 21(2), 127-144.

Chicago 7th ed.

Jonathan Kathrein, "The Future of Drones Is the Railroad," Intellectual Property and Technology Law Journal 21, no. 2 (Spring 2017): 127-144

McGill Guide 9th ed.

Jonathan Kathrein, "The Future of Drones Is the Railroad" (2017) 21:2 Intellectual Property & Technology LJ 127.

MLA 8th ed.

Kathrein, Jonathan. "The Future of Drones Is the Railroad." Intellectual Property and Technology Law Journal, vol. 21, no. 2, Spring 2017, p. 127-144. HeinOnline.

OSCOLA 4th ed.

Jonathan Kathrein, 'The Future of Drones Is the Railroad' (2017) 21 Intell Prop & Tech L J 127

-- Your use of this HeinOnline PDF indicates your acceptance of HeinOnline's Terms and Conditions of the license agreement available at

<https://heinonline.org/HOL/License>

-- The search text of this PDF is generated from uncorrected OCR text.

-- To obtain permission to use this article beyond the scope of your license, please use:

[Copyright Information](#)

The Future of Drones Is the Railroad

JONATHAN KATHREIN*

INTRODUCTION

Amazon, Alphabet, FedEx, UPS, 7-Eleven and others are developing a system of drones to deliver packages.¹ These operators believe drones can significantly reduce shipping costs and increase the speed of deliveries.²

In July 2016, 7-Eleven completed the first retail drone delivery in the United States.³ In December 2016, Amazon Prime Air, Amazon's drone delivery service, completed its first delivery in England.⁴ Now, Amazon is planning airborne warehouses.⁵

Federal Aviation Administration (FAA) regulations, private property rights, state property laws, and local ordinances are a few of the hurdles these operators will have to overcome before they can provide a drone delivery service. At the federal level, drone travel at high altitudes is currently restricted by the FAA. At the state level, travel at low altitudes over private property requires agreements from a patchwork of property owners.

There is a solution. Drone operators can use the low-altitude airspace above railway corridors. By using railway corridors, operators can avoid local regulations and the need to obtain a property owner's permission. It is more efficient to obtain permission from one property owner with vast expanses of private property, than to obtain permission from many different private property owners, who

*Jonathan Kathrein earned his Juris Doctor in May 2017 with a focus on business and real estate law transactions. He has spent years researching real property and regulatory issues for the Northwestern Pacific Railroad. Jonathan would like to thank Erythean Martin for suggesting the idea, Tyson Winarski for pushing him to write about it, and his wonderful classmates at University of San Francisco School of Law for editing his work.

1. Rather than using the burdensome name of Unmanned Aircraft Systems (UAS) we will simply refer to UAS as drones.

2. Eugene Kim, *The most staggering part about Amazon's upcoming drone delivery service*, BUSINESS INSIDER (Jun. 15, 2016, 2:38 PM), <http://www.businessinsider.com/cost-savings-from-amazon-drone-deliveries-2016-6>.

3. April Glaser, *7-Eleven beats Google and Amazon to the first regular commercial drone delivery service in the U.S.*, RECODE (Dec. 20, 2016, 2:14 PM), <http://www.recode.net/2016/12/20/14026396/7-eleven-drone-delivery-flirtey-first-retail-us-reno-nevada> (The delivery was in Reno, Nevada and stayed within the pilot's line of sight).

4. AMAZON PRIME AIR, <https://www.amazon.com/Amazon-Prime-Air/b?ie=UTF8&node=8037720011> (last visited Dec. 3, 2017) (stating delivery went beyond the pilot's line of sight and the drone flew below 400 feet).

5. Sam Shead, *Amazon Files Patent for Airborne Warehouses*, INC.COM (Jan. 3, 2017), <http://www.inc.com/business-insider/amazon-files-patent-floating-warehouse-drone-delivery.html>.

collectively have dominion over the same stretch of land. Railroads already have the rights to corridors in place. Furthermore, railroads have enough property that drone operators can use the railroads' airspace for both movement and warehousing. It is a marriage of two industries that will provide little interfere with each other.

I. THE BUSINESS CASE FOR RAILROAD CORRIDORS

Drone operators should see a business opportunity in utilizing railroad corridors for three reasons. Railroad corridors can provide drone operators with increased economic efficiency, increased safety, and improved regulatory arbitrage.

A. INCREASED ECONOMIC EFFICIENCY

Economically, railroads and drones help each other. Railroads have an uneven stream of revenue. Railroad revenue depends on the economy and the price for the particular commodities they ship. Their most important expense is fuel cost. A weak economy and low commodity prices, paired with high fuel prices, can be crippling, especially for smaller railroads. The California State Rail Plan states that operating costs for small railroads range from about 75% to 110% of revenue, and that these small railroads depend on other income sources such as income from rental property and utility leases to survive.⁶ In addition, small railroads rely on the 45G tax credit, which can provide up to \$3,500 of credit to the railroad for each mile of track owned or leased.⁷ The supplemental income and a steady, predictable revenue stream, most likely from leasing airspace, could mean survival for some railroads.

For drone operators, the speed of acquisition means savings. There is a much lower cost to negotiating a single big agreement than contracting many small individual ones. Sharing land across multiple uses creates economies of scope, thus reducing costs. An additional economic benefit is that drone operators and freight trains will not compete with each other. Freight trains efficiently transport heavy cargo, while drones will primarily deliver lightweight objects. It is a mutually beneficial economic relationship.

Allowing drone operators to have flyover rights does not impact the railroad operation and gives railroads a chance to make more money by leasing the air corridors above the tracks. For drone operators, this could lead to market penetration, providing a realistic opportunity for operation and delivery.

6. CAL. DEP'T OF TRANSP., CALIFORNIA STATE RAIL PLAN: 2007-08 TO 2017-18, 234 (2008), http://californiastaterailplan.dot.ca.gov/docs/SRP07_-_FINAL_Apprvd.pdf.

7. RAILROAD TRACK MAINTENANCE CREDIT, 26 U.S.C. § 45G (2015).

B. INCREASED SAFETY

The public and the FAA are especially concerned with drone safety,⁸ including collisions with other drones, objects, and even people. Using railroad right-of-ways as drone corridors enhances drone safety by avoiding these types of collisions.

One of the great limitations on drone travel is the risk of crashing into whatever is in the air around it or on the ground underneath it. A train, especially a freight train, is a rugged piece of equipment. A thirty to fifty-five pound, mostly plastic, drone crashing into a train would have little impact on the train. On a railway corridor, drone operators will have to worry less about the liability of crashing into a plane, person, or vehicle than about what could happen to a drone if it collides with a train.

In addition to reducing drone operators' liability from crashes, railway corridors reduce obstacles a low-flying drone might encounter, such as trees, telephone poles, and buildings that could damage the drone. Trains are of predictable heights. Furthermore, geographic features, like tunnels, can be predictably mapped. All of these factors make these paths safe for the drones.

A sliver of airspace, just above the train cars, could be used for drone travel. For example, a rail car may be fifteen and one half (15.5) feet. Railroad guidelines require twenty-two and one half (22.5) feet of clearance, free of bridges, poles, and other structures, over the top of a railcar, along the entire length of the track.⁹ This twenty-two and one half (22.5) foot space free of obstacles could be used by drones.

C. REGULATORY ARBITRAGE

Drone operators are facing a long, regulatory process at the federal level with many grey areas. There is unsettled law surrounding state and federal jurisdictions. Also it is unclear which federal agency has legal authority, and the authority of multiple agencies may contradict, leading to confusion. Is low-altitude, unmanned flight over railroad corridors railroad operation, aviation, or something else? There is an opportunity for the first movers to shape the regulatory landscape or encourage Congress to create new laws or propose a new agency. In the meantime, there is an opportunity for regulatory arbitrage, a chance to take advantage of the unsettled law for a few years with little competition.

8. Mike Murphy, *Worried about the safety of drone delivery? NASA has your back*, QUARTZ (Sep. 17, 2015), <https://qz.com/504678/worried-about-the-safety-of-drone-delivery-nasa-has-your-back/>.

9. OVERHEAD CLEARANCES FOR STANDARD GAGE INDUSTRIAL RAILROAD TRACKS, 8 C.C.R. § 3736 (2017), <https://www.dir.ca.gov/title8/3736.html>.

II. TURNING CHALLENGES INTO OPPORTUNITIES

Drone operators are eager to take advantage of the cost and time savings of drone deliveries. Utilizing railroad corridors is an exciting strategy that helps make drone deliveries more efficient and safe, while avoiding some of the regulation. Operators will have to turn the following challenges into opportunities.

The first challenge is that there is no bright line answer for where the lower limit of the federal airspace begins and the upper limit of where private property ends. The lines are a legal and regulatory grey area since it is unclear which agencies would have authority over these questions.

The second challenge is that, assuming one is within private property airspace, case law and statutes focus on the right to exclude. What about the right to possession and the right to transfer under state law?

Third, railroads are unique holders of real estate, and there are many subtleties to their property ownership of which drone operators need to be aware.¹⁰

A. AVIATION LAW GREY AREA

Airspace can be broken into two categories: federally regulated airspace and private property. Federal regulation has traditionally focused on the navigability of manned aircrafts. Conceptually, the federal airspace, sometimes called the public domain, must have an upper and lower limit. Yet those limits are hard to define. The lower limit, which is important for moving goods by drones is unclear. Aviation cases relating to private property are usually about the property owner's desire to exclude air travel, especially at low altitudes.

Who has jurisdiction over low-altitude airspace is complex and unsettled. The statutes, regulations, and court decisions have historically focused on manned aircrafts and were enacted when drones did not exist. Recreational drone use fits within the FAA's existing Special Rule for Model Aircraft.¹¹ However, commercial drone use does not fit the rule for model aircrafts and the FAA has to develop a new rule, which is a time consuming process. While the FAA is setting rules for how commercial drones should operate in federally regulated airspace, it is possible for an operator to exist outside the federal government's jurisdiction, and start operating more quickly.

10. In 1879, California created the State Board of Equalization (BOE). One of the primary reasons for forming the BOE was to handle the complex property taxes associated with railroads.

11. Fed. Aviation Admin., *Unmanned Aircraft Systems (UAS) Frequently Asked Questions: Flying for Fun Under the Special Rule for Model Aircraft*, FAA.GOV, <https://www.faa.gov/uas/faqs/#ffr> (last modified Jul. 11, 2017).

1. Federal Jurisdiction

The U.S. government has exclusive sovereignty over its airspace, and U.S. citizens have the public right of transit through the navigable federal airspace.¹² Congress has delegated the administration and regulation of “navigable airspace” to the FAA, a branch of the Department of Transportation.¹³ The FAA regulations focus on the efficient use of the airspace, as well as the protection of people and property on the ground. But what is exactly airspace and is navigable airspace distinguishable?

Federal statutes do not define “airspace,” but do define “navigable airspace” as the “airspace above the ‘minimum altitudes’ of flight prescribed by regulations . . . including airspace needed to ensure safety in the takeoff and landing of [an] aircraft.”¹⁴

The federal regulations set out a “minimum safe altitude” (“MSA”) for flight over various areas.¹⁵ While these regulations do not limit the federal government’s jurisdiction, they do limit the MSA for an aircraft. An “aircraft” is defined as any device “invented, used, or designed to navigate, or fly in, the air.”¹⁶

The MSA over a congested area is one thousand (1,000) feet above the highest obstacle and over a non-congested area is five hundred (500) feet above the surface. There are no minimums set for the airspace over water, over sparsely populated areas, or for takeoff and landing.¹⁷

In summary, the situation is complex because the limit for navigable airspace varies depending on the situation. Currently, FAA regulations begin at five hundred (500) feet, and move upward,¹⁸ but five hundred (500) feet is not a jurisdictional limit. The FAA simply has not exercised its jurisdiction below that level, except to tell drones and model aircrafts to stay below the MSA of navigable airspace, specifically below four hundred (400) feet.¹⁹

The grey area is somewhere between the property rights of those

12. 49 U.S.C. § 40103 (a)(1)-(2) (2012).

13. *Id.* § 40103(b)(1) (2012).

14. *Id.* § 40102(a)(32) (2012).

15. 14 C.F.R. § 91.119 (2010).

16. *Id.* § 1.1 (2017).

17. *Id.* § 91.119 (2010).

18. Mark J. Connot & Jason J. Zummo, *Navigable Airspace: Where Private Property Rights End and Navigable Airspace Begins*, FOX ROTHSCHILD LLP (Jan. 15, 2016), <https://ontheradar.foxrothschild.com/2016/01/articles/auvsi/navigable-airspace-where-private-property-rights-end-and-navigable-airspace-begins/>.

19. FED. AVIATION ADMIN., DEP’T OF TRANSP., INTERPRETATION OF THE SPECIAL RULE FOR MODEL AIRCRAFT, 4 (2014), http://californiastaterailplan.dot.ca.gov/docs/SRP07_-_FINAL_Apprvd.pdf. (stating that model aircraft, including recreational drones, flown for hobby purposes, and commercial drones must stay below 400 feet and be within line of sight; see also Federal Register, *Operation and Certification of Small Unmanned Aircraft Systems*, FEDERALREGISTER.GOV (Jun. 28, 2016), <https://www.federalregister.gov/documents/2016/06/28/2016-15079/operation-and-certification-of-small-unmanned-aircraft-systems>

on the ground and the MSA.²⁰ There are also exceptions to the lower limit of navigable airspace, such as the airspace needed for takeoff and landing, and airspace used for emergencies. Both are considered part of the federal airspace, but elude exact definitions. Somewhere near the ground seems to fall within state jurisdiction.²¹ And there may be space in the middle that could be regulated by both the state and federal government, or neither.

2. New Drone Regulations

In passing the FAA Modernization and Reform Act of 2012, Congress directed the FAA to set rules for small unmanned aircrafts.²² The FAA issued a final rule in 2016 that amended the federal regulation to allow the operation of small unmanned aircraft systems in the National Airspace System.²³ The federal regulations now restrict small unmanned aircrafts, those weighing less than fifty-five (55) pounds, to a maximum altitude of four hundred (400) feet, either above ground or above a structure.²⁴ The aircraft must also remain in a visual line of sight.

This new regulation has two implications. First, the FAA has exercised its jurisdiction at a lower altitude, which presents an issue of jurisdictional creep into state's rights, or at least the potential overreach of another body of the federal government. Second, it is not possible to make drone deliveries past a certain distance in federal airspace within the line of sight. These new regulations cause drone operators to search for a viable solution. If drone operators stay at low altitudes, out of the way of manned aircrafts, the FAA should not be involved.

3. Bypassing The Congestion

Most of the regulatory and legislative battles are currently being fought on two fronts: over federally regulated airspace and over state and local government's ability to prevent drone use below the MSA. Because of federal jurisdiction over air travel, states' roles have been

20. See Connot & Zummo, *supra* note 18.

21. See Fed. Aviation Admin., *Overview of Small UAS Notice of Proposed Rulemaking*, FAA.GOV (Feb. 15, 2015), https://www.faa.gov/regulations_policies/rulemaking/media/021515_sUAS_Summary.pdf (Though not precisely defined, "navigable airspace" has until recently been thought of as generally describing airspace beginning at a point higher than 400 feet above ground level, as demonstrated in part by a 1981 FAA Advisory (AC 91-57). S. Judiciary Comm. Summary of S.B. 142, Apr. 6, 2015. While the FAA does not set 500 feet as a limit to their jurisdiction, in the Small Unmanned Aircraft Systems (UAS) - Notice of Proposed Rulemaking Summary, the FAA proposes to restrict Small UAS to a maximum of 500 feet.)

22. SPECIAL RULES FOR CERTAIN UNMANNED AIRCRAFT SYSTEMS, Pub. L. No. 112-95, § 333, 126 Stat. 75 (2012), <https://www.gpo.gov/fdsys/pkg/PLAW-112publ95/html/PLAW-112publ95.htm>.

23. Federal Register, *Operation and Certification of Small Unmanned Aircraft Systems*, FEDERALREGISTER.GOV (Jun. 28, 2016), <https://www.federalregister.gov/documents/2016/06/28/2016-15079/operation-and-certification-of-small-unmanned-aircraft-systems>.

24. *Id.*; see also 14 C.F.R. § 107.51 (2016).

limited to either not regulating or preventing drone use in public spaces and over private property. Through states' actions, it appears that drones would be able to travel at low altitudes in private airspace with a property owner's permission.

Private airspace is getting less attention. Companies like Amazon and 7-Eleven are testing their service in locations where they have permission to fly.²⁵ But these companies seem unable to expand beyond a few neighboring properties. With the current regulations in place, they cannot make deliveries over longer distances.

B. PRIVATE PROPERTY RIGHTS IN AIRSPACE

In California, a series of basic assumptions could easily cease conversations about drones. First, most people assume drones are aircrafts. They are not. The second assumption is that the airspace in which a drone flies must be "navigable." It may not have to be. Third, it is assumed that only private property owners wish to exclude drone use in their airspace. This assumption is also not true, but the drone operators do need to flesh out where drone traffic can be permitted.

Instead these incorrect assumptions should be reframed as questions. Is there a regulatory void in state airspace? What does a state or local drone ban mean? What property rights does the underlying landowner have?

1. Do States Have Authority Over Airspace?

State authority for regulating low flying aircrafts is unsettled. California aeronautics law gives deference to federal law and has its own unique requirements. The State Aeronautics Act, for example, gives the state permission only to establish regulations that are essential and clearly within the scope of the authority granted by the legislature.²⁶ It also provides the state with jurisdiction over airspace and aircraft operation that is not within federal jurisdiction.²⁷

The State Aeronautics Act starts by recognizing federal authority:

This state recognizes the authority of the federal government to regulate the operation of aircraft and to control the use of the airways, and nothing in this act shall be construed to give the department the power to so regulate and control safety factors in the operation of aircraft or to control use of the airways. This section does not affect the state's power to regulate the intrastate rates of common carriers by air, and such power is hereby reserved to the state.²⁸

The Act allows for flight over land and water, unless it is at altitudes below those prescribed by federal authority, or unless

25. AMAZON PRIME AIR, <https://www.amazon.com/Amazon-Prime-Air/b?ie=UTF8&node=8037720011> (last visited Dec. 3, 2017).

26. CAL. PUB. UTIL. CODE § 21001 (West 1961).

27. *Id.* § 21401 (West 1968).

28. *Id.* § 21240 (West 1969).

conducted so as to be imminently dangerous to persons or property lawfully on the land or water beneath.²⁹ However, unlike the federal law, the state law definition of “aircraft” only includes *manned* vehicles.³⁰ California law does not address unmanned aircraft flights. Arguably, if a drone is in California airspace, it may be unrestricted.

2. Efforts To Ban Drone Use Within California

To avoid federal preemption, state and local laws approach drone regulation as an issue of land use, safety, or privacy, rather than one of aviation.³¹ The focus of state regulations is prevention of unwanted use, not facilitation of desired use. The state of California, and a few local governments within the state, have attempted to regulate or ban drone flight over private property.

In 2015, both the California Senate and Assembly passed Senate Bill 142. It was vetoed by Governor Brown, and did not become law. Senate Bill 142 would have prohibited drone flight over all private property in the state by creating civil liability for wrongful occupation of the property.³² Specifically, the bill would have:

“extend[ed] liability for wrongful occupation of real property and damages to a person who operates an unmanned aircraft or unmanned aircraft system, as defined, less than 350 feet above ground level within the airspace overlying the real property, without the express permission of the person or entity with the legal authority to grant access or without legal authority.”³³

Two California cities have passed their own drone bans—Berkeley and Rancho Mirage.³⁴ Berkeley declared itself a “No Drone Zone” and prohibited drone flight in the city’s airspace.³⁵ The city of Berkeley cited safety as their main reason for banning drones. Beyond the proclamation of a drone ban, which acknowledges that technology is moving much faster than the law, it is unclear what enforcement mechanism exists or will exist. Cities in at least thirty-one other states have or are considering similar drone prohibitions.³⁶

29. *Id.* § 21403(a) (West 1987).

30. *Id.* § 21012 (West 1984).

31. Steven Miller & Nicole Witt, *Local Drone Regulations and Possible Federal Preemption*, HANSON BRIDGETT DRONE L. BLOG (Dec. 28, 2015), <https://www.hoverlaw.com/local-drone-regulations-and-possible-federal-preemption/>.

32. S.B. 142, 2015 Leg., Reg. Sess. (Cal. 2015), https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB142 (last visited Dec. 3, 2017).

33. *Id.*

34. Syracuse University Inst. for Nat’l. Sec. and Counterterrorism, *Domesticating the Drone: Evaluating Privacy Policy in the Use of Unmanned Aerial Vehicles Within the U.S.*, INSCT.ORG, <http://uavs.insct.org/local-regulation/> (last visited Dec. 3, 2017).

35. Email from George Lippman, Chairperson, Peace and Justice Commission to Honorable Mayor and Members of the City Council (Dec. 18, 2012), http://www.ci.berkeley.ca.us/Clerk/City_Council/2012/12Dec/Documents/2012-12-18_Item_05_Proclaim_Berkeley_a_No_Drone.aspx.

36. Email from Noah Sochet, Chairperson, Peace and Justice Commission to Honorable Mayor and Members of the City Council (Apr. 29, 2014), https://www.cityofberkeley.info/Clerk/City_Council/2014/04_Apr/Documents/2014-04-

Other California cities have attempted to limit drone use through ordinances that regulate, but not ban, drone operation within the city, including above public spaces and parks. In 2016, the Golden Gate Bridge, Highway and Transportation District banned drone use near the Bridge.³⁷ Golden Gate Bridge officials cite the risk and danger of drone crashes as the reason for the ban.³⁸

States are caught between a rock and a hard place. They cannot regulate navigable airspace, so they believe they cannot create a system for operating drones, only prohibitions. The result is that the state and local laws focus on preventing unwanted use, similar to preventing an aerial trespass. The problem, which can be seen in reports given in cities like Berkeley, where there have been efforts to prevent drone use, is that the right answer is more complicated than blanket prohibitions. Drones make sense for some uses, but not for others. The desire to regulate but the sense that cities do not have the ability to do anything other than prohibit, has led to a stalemate.

An oversight, by the public and the drone industry, is that the state and local laws in California do not prevent drone use over one's own property or where the operator has permission from the property owner. The right to possession is a property right. With the right to possession comes the right to have your things on your property. If one has a large enough piece of property, one can have more things on it, and move them around over greater distances. However, it seems that no one has found a large enough piece of property close to urban centers, which is where railroads can become effective.

3. What Airspace Rights Do Property Owners Have?

States have jurisdiction over property and some portion of the airspace above it. Relevant property law includes the right to possess, the right to exclude, and the right to transfer.³⁹ Private property comes in all shapes and sizes, each with a different type of owner. There are small plots of residential and commercial land in cities, as well as state and federal forests and wilderness preserves. There are also local roads, state roads, and interstate highways. And then there are railroads.

In the 1946 Supreme Court decision, *United States v. Causby*,⁴⁰ Justice William Douglas stated that while navigable airspace is in the

29_WS_Item_01a_Drone_Policy_for_the_City.aspx.

37. Golden Gate Bridge, Highway & Transp. Dist., *Don't Fly Drones at the Golden Gate Bridge*, GOLDENGATE.ORG (Dec. 29, 2015), <http://goldengate.org/news/bridge/drones-prohibited-on-golden-gate-bridge.php>.

38. Bay City News Service, *No-drone signs going up at Golden Gate Bridge*, SF GATE (Dec. 22, 2015, 1:59 PM), <http://www.sfgate.com/bayarea/article/No-drone-signs-going-up-at-Golden-Gate-Bridge-6715857.php>.

39. Sometimes the state and federal government also have rights as a property owner, as is the case in parks and forests. For our purposes, we will include property owned by the government as private property, to simplify the separation of property rights and legal jurisdiction.

40. 328 U.S. 256 (1946).

public domain, a landowner does own ‘at least as much of the space above the ground as he can occupy or use in connection with the land.’⁴¹ This decision established that landowners *do* have a right to exclude others from low-altitude, non-navigable airspace over their property.⁴² If landowners have a right to exclude others from airspace, it also suggests the inverse of the right to exclude, that is, the right to possession. The right to possession of the airspace above one’s property exists so long as it is “in connection with the land.”

Drone delivery, over a railway corridor, used for moving freight, should be enough to meet the *Causby* criteria of being a use “in connection with the land” since both the drone and the railroad operate to deliver freight. In the case of a railway corridor, what might otherwise be non-navigable may be navigable for a limited use, such as with unmanned drones, also delivering freight, over predictably-sized rail cars.

When a drone flies at some altitude, below 500 feet, it encounters private property. Flying over a series of residential parcels can lead to noise complaints or catastrophic crashes. Flying over parks causes similar problems. Flying over a highway can lead to interference with cars and traffic, both as a distraction to drivers and catastrophic crashes. But flying over large trains that move predictably along major corridors of private property have few of these problems. There are minimal distractions, few pedestrians, and nearly any noise issues. As with the large drone test sites, like rural farms and airports, railroads have one landowner for a major stretch of land, making a single agreement enough to cover many miles of travel.

4. Can Airspace Rights Be Transferred?

The private property right to exclude others from one’s property is well settled, but the ownership and transferability of airspace over private property is less clear. Can airspace above property be owned and conveyed?

California statutes state that the ownership of a thing is the right of one or more persons to possess and use it to the exclusion of others.⁴³ The thing readily linked with ownership is property.⁴⁴ Property includes real property, and real property includes land.⁴⁵ Land includes free or occupied space for an indefinite distance vertically, subject to limitations upon the use of airspace imposed, and rights in the use of airspace granted by law.⁴⁶

The Miller and Starr California Real Estate treatise describes a

41. Troy A. Rule, *Airspace in an Age of Drones*, 95 B.U. L. REV. 155, 168 (2015) (quoting *United States v. Causby*, 328 U.S. 256, 260-261 (1946)).

42. *Id.*

43. CAL. CIV. CODE § 654 (West 1872).

44. *Id.*

45. *Id.* §§ 657 & 658 (West 1872).

46. *Id.* § 659 (West 1872).

surface landowner's rights to airspace as the following: "[t]he owner of land has rights in all free or occupied space above and below the land."⁴⁷ But a landowner's airspace rights are subject to regulations and rights granted to others: "[i]n other words, the geometric space above and below the surface belongs to the owner of the land, unless its ownership has been separately transferred or conveyed."⁴⁸ Thus, the upper limit of this right is the useable airspace above the land that is beneficial and enjoyed in and of itself.⁴⁹

Ownership of airspace can be separated from the ownership of the land.⁵⁰ It is possible to subdivide land vertically and transfer airspace with no interest in the underlying land, although the airspace may need easements for support.⁵¹ For example, the California Department of Transportation can lease airspace above highways.⁵² Similarly, property owners may grant open-space easements over private land for preservation, as seen by the creation of high-rise condominiums.⁵³

Similarly, American Jurisprudence explains the following:

[t]he owner of land in fee holds all the complex elements of a single right, which include not only the right to use the surface, but so much of the superjacent airspace as he or she can use. A landowner's property interest in land extends to the airspace directly over the property, to the extent that the airspace can be used to benefit the underlying land.⁵⁴

The property interest of the surface owner in airspace above the land is limited to airspace, which is below navigable limits.⁵⁵ The height limit of the airspace the surface owner may reasonably expect to occupy is not a definite one.⁵⁶

The concept of transferring airspace in the form of an easement, lease, or license is a logical one. These forms of property ownership exist for other purposes. Nothing in California law prohibits such a transfer, yet a search of statutes, cases, and secondary sources suggests no one has tried it yet. Railroads and drone operators should develop a freight easement for airspace above the height needed for trains and

47. MILLER STARR REGALIA, CALIFORNIA REAL ESTATE 9-130 (Thomson Reuters eds., 4th ed. 2016); *see also* CAL. CIV. CODE §§ 659 & 829.

48. MILLER STARR REGALIA, *supra* note 47.

49. MILLER STARR REGALIA, *supra* note 47, at 9-132.

50. MILLER STARR REGALIA, *supra* note 47, at 9-131.

51. MILLER STARR REGALIA, *supra* note 47, at 9-131; *see also* CAL. CIV. CODE §§ 4125(b) & 6542(b) (West 2014).

52. MILLER STARR REGALIA, *supra* note 47, at 9-132; *see also* CAL. STS. AND HIGH. CODE § 104.12 (West 2001).

53. MILLER STARR REGALIA, *supra* note 47, at 9-132; *see also* CAL. GOV'T CODE §§ 51050–51065 (West 1974).

54. 8A AM. JUR. 2D, Aviation § 2; *see also* Swetland et al. v. Curtiss Airports Corp. et al., 55 F.2d 201, 203 (6th Cir. 1932).

55. *See* 8A AM. JUR. 2D, Aviation §§ 2 & 6.

56. *Id.*; *see also* United States v. Causby, 328 U.S. 256, 266 (1946). (“The airspace, apart from the immediate reaches above the land, is part of the public domain. We need not determine at this time what those precise limits are.”).

below the federal navigable airspace.

III. RAILROAD CORRIDORS AND THEIR SUBTLETIES

A. RAILROAD CORRIDORS GENERALLY

The railroads, long contiguous corridors of private property, may be the ideal solution for drone corridors. The rail network connects most major cities, both to each other, and to ports, throughout the United States and abroad. The two major railroads that operate in California, the Burlington Northern Santa Fe and the Union Pacific, alone cover over five thousand four hundred twelve (5,412) miles within the state.⁵⁷ The short-line railroads, small railroads that connect to the major lines, add additional mileage.

The California State Rail Plan states that California is a key link in the national freight rail system.⁵⁸ The State Plan considers active, inactive, and abandoned railroads as a major route of travel, not only for freight trains but also for passenger trains, bicycles and pedestrians. The State Plan does not mention drones as a user for the rail network.⁵⁹ This oversight means there is an opportunity.

Drone operators can avoid existing regulation and prohibitions by flying within the realm of private property, with the property owner's permission. Once drones start operating in railroad corridors, states, like California, will have to catch up.

B. SUBTLETIES OF RAILROAD PROPERTY

Railroads are unique holders of real property. Drone operators should be aware of some subtleties of railroad property. What happens if the property rights are ambiguous? What if the railroad stops operating on an easement specifically for railroad operation? What regulatory body should govern drone operation on a railroad? What happens when the drone leaves the railroad right-of-way? How is flight on the line managed? Many of these subtleties can be overcome, and some may work to the drone industry's benefit.

1. What About Ambiguous Rights, Boundaries, And Access?

In coastal Northern California, the Northwestern Pacific Railroad line ("NWP") runs from Eureka to Novato, then turns east and connects to Napa, where it joins the interstate rail network. Of the

57. CAL. DEP'T OF TRANSP., CALIFORNIA STATE RAIL PLAN: 2007-08 TO 2017-18, 216 (2008), http://californiastaterailplan.dot.ca.gov/docs/SRP07_-_FINAL_Apprvd.pdf; see also Cal. Dep't of Transp., *Freight Rail: Overview*, DOT.CA.GOV, http://www.dot.ca.gov/hq/tpp/offices/ogm/freight_rail.html (last visited Dec. 3, 2017).

58. CAL. DEP'T OF TRANSP., CALIFORNIA STATE RAIL PLAN: 2007-08 TO 2017-18, 213 (2008), http://californiastaterailplan.dot.ca.gov/docs/SRP07_-_FINAL_Apprvd.pdf.

59. Cal. Dep't of Transp., *Freight Rail: Overview*, DOT.CA.GOV, http://www.dot.ca.gov/hq/tpp/offices/ogm/freight_rail.html (last visited Dec. 3, 2017).

more than five thousand four hundred (5,400) miles of railroad in California, the NWP is less than three hundred (300) miles long and is operational on less than seventy (70) miles.⁶⁰

Much of the NWP was built in the late 1800s and early 1900s, as a series of even smaller railroads, which were later consolidated. In the consolidation, portions and branches off the mainline were abandoned. Land was transferred to the railroads in the form of right-of-ways, easements, and fee ownerships.

Often times the form of transfer is not clear. A transfer of property may only describe a track running through a greater property, often with a designated width and length. Other times, the transfer refers to a map or survey, like “Stratton’s Map of Petaluma,” to describe where the track will go.⁶¹ Maps like this one show a nineteenth century city, with little detail, before the railroad was built, and a transfer may refer to blocks, which are numbered on the map.

In addition to the ownership right being unclear, the access right across surrounding property is also sometimes unclear. What if the railroad runs for many miles, through fields, without access roads? Can the railroad company access these tracks across the larger parcels? Sometimes the transfer includes access, but sometimes it does not. If access to the right-of-way is provided in the easement, it could be a benefit to drone operators by providing access to the surrounding area. For example, a large stretch of railroad in Cloverdale, California, was conveyed by grant deed to the San Francisco and North Pacific Railroad Company in November 1891.⁶² The conveyance was written in cursive by hand, sometimes adding to the legal ambiguity. It was described as:

a portion of the Rancho Musalacón more particularly described as follows. Being a strip or tract of land eighty feet wide upon the located line of the said San Francisco and north Pacific Railroad Company’s railroad. The center of said railroad tract being the center of said tract of land said tract of land commencing at the Southern line of a larger tract of land there situated and owned by one and ending at the Northern line of said larger tract being in length forty-seven hundred and fifty feet and containing eight and sixty [illegible] hundredths acres of land more or less. To have and to hold the said described tract of land and the right of way across said larger tract of land together with all the rights and privileges necessary to the enjoyment thereof and all of our right title interest or [illegible] to said described tract of land . . .⁶³

This conveyance leaves the railroad with a poorly described fee ownership of nearly a mile of railroad track, eighty (80) feet wide,

60. *Northern Pacific Railroad*, WIKIPEDIA, https://en.wikipedia.org/wiki/Northern_Pacific_Railroad (last edited Nov. 18, 2017).

61. Jas T. Stratton, *Map of the City of Petaluma, California*, SONOMA COUNTY LIBRARY (Dec. 1865), <http://heritage.sonomalibrary.org/cdm/ref/collection/p15763coll4/id/47>.

62. SHAMROCK QUITCLAIM, *microformed on* Cloverdale Deed Book 41, 97.

63. *Id.* at 98.

across a large field with a broad access easement.

An undated Railroad Valuation Map that appears to have been made in the 1920s shows the track, but there are few landmarks surrounding it.⁶⁴ The most prominent landmark is the Russian River, which has moved over the years, and changed in width each year. Currently, there is an old dilapidated rail car on a short, dead end track nearby. This railcar could suggest that the railroad moved the track at some point, or multiple times, or maybe there was a spur to access the river, likely for gravel mining, which was removed or buried by dirt. The conveyance does not mention this track, leaving the question as to whether it was assumed to be part of the vague conveyance, a later addition that was either unrecorded or lost in the railroad and the County's records, an oral license, or a prescriptive easement. If it was a spur accessing the river from the mainline, does that leave the railroad with rights (and airspace rights) to this property as well? Or was it an unrecorded easement that has been extinguished over time? This scenario is not unique. Property questions like this exist all along railroad lines. There are more questions than answers.

These questions generally arise on the margins. The mainline is protected by federal preemption and the federal law abandonment requirement. Abandonment requires a railroad to show that it faces a high financial burden before the railroad is allowed to stop operating over a rail line. The ambiguous nature of railroad property ownership could be an opportunity in itself, especially for a project that does not involve the risk of building a structure on property with unclear ownership.

2. What Happens If The Railroad Stops Operating?

The government's policy is to protect railroad corridors for interstate commerce and promote healthy competition along those lines.⁶⁵ Once authorized by the Surface Transportation Board (STB), a railroad must operate a line and that line is preserved until it is formally abandoned through a process facilitated and authorized by the STB.⁶⁶ This means a stagnant rail line does not automatically terminate. Railroads are sometimes built on easements for the purpose of railroad use or railroad transportation. Lack of use alone, that might otherwise cause an easement to revert to the fee title owner of the property, does not apply in this case.

So if a railroad stops operating, are the easements extinguished and the right-of-way abandoned? Without an operating railroad, a railroad's easement may be extinguished under state property law. Most likely, drone use alone cannot preserve a railroad easement

64. STATE BOARD OF EQUALIZATION, LAND IDENTIFICATION MAP: RIGHT OF WAY AND TRACK MAP V2-16, *microformed on* NW. PAC. R.R. CO.

65. 49 U.S.C. § 10101 (2012).

66. *Id.* §10903 (2012).

under state law, but supplementing a railroad's revenue may help the railroad continue operation over an otherwise unprofitable stretch of land. The state property law challenge has a federal solution: drones can help protect the national rail system under federal law, where there is an extra layer of protection. States have an incentive to allow drone operators to enter into a symbiotic relationship with an operating railroad, which otherwise may be at risk of failing.

By leasing the low airspace over a railroad corridor, drone operators can preserve rail lines in three ways. First, drone deliveries would supplement the railroad's income and allow it to keep operating. This operation would preserve the easement under state law and avoid abandonment of the line under federal law. Second, the argument can be made that drone use is enough to keep a line from being abandoned, even under existing federal law. Third, drone operators could propose legislation preventing abandonment since the lines could be used for drone deliveries.

Abandonment requires a burden on interstate commerce. In the case of *Northwestern Pacific Railroad Company v. United States*, the federal district court held that a destroyed tunnel, bisecting a portion of the Northwestern Pacific line in Southern Marin County, leaving only a few miles of track inaccessible, was not enough to abandon the now isolated portion of the line. Because repairing the tunnel would not cause a loss of overall profitability for the railroad line, but could add future profitability, the railroad would be required to repair the tunnel. The district court upheld the Interstate Commerce Commission's (the predecessor to the STB) determination that "there [was] a continuing need for rail service in the area affected; that abandonment would adversely affect the shipping public; that no long-run losses would be incurred by [the railroad] in its overall system; and [that] the plaintiff [was] financially able to restore the tunnel."⁶⁷

The STB, under the statute, could consider potential future uses for railways.⁶⁸ Additionally, Congress could add a provision to federal law to protect the railroad lines that could be preserved as drone corridors. A new law would further the federal government's existing policy to protect interstate commerce and competition along rail lines.⁶⁹ Once a railroad corridor leaves the national rail system through abandonment, presumably because the traffic has decreased as times have changed, that line's ability to facilitate interstate commerce is lost. But the current lack of rail use does not mean it cannot be put to a different beneficial use in the future, such as shipping freight by drone. This potential improvement to the federal rail law could preserve some rail lines that are in an otherwise precarious position.

67. *Nw. Pac. R.R. Co. v. United States*, 228 F. Supp. 690, 695 (N.D. Cal. 1964).

68. 49 U.S.C. § 10903 (2012).

69. *Id.* § 10101 (2012).

3. What Regulatory Body Should Govern Drone Operation On A Railroad?

Overlapping regulatory authority is common, but still confusing. In the railroad business, the STB has authority over movement of goods and the Federal Railroad Authority (FRA) has authority over safety. Sometimes when these subjects overlap, the STB and FRA harmonize their authority. From an industry perspective, the STB generally has jurisdiction over the shipment on freight railroads, while the FAA has jurisdiction over air travel.

In the case of drones, both the FAA and STB may decide that drones, which could fly below tree height, are neither railroads nor air travel. State property law could apply, and the drones could stick to private property during their travel, where they have permission to fly. Any result is a legal void or grey area, but all of these possibilities would be a good result for drone operators because they will be able to either operate or shape a new set of rules.

4. What Happens When The Drone Leaves The Rail Line?

Some railroad easements provide access to and from the right-of-way across large swathes of property. This access to the railroad corridor may be enough to connect drone operators nearly to their destination. But what happens when drones, traveling exclusively along a rail corridor, reach their city of destination and need to leave the rail line? This situation is unresolved, but not a new problem. Drone operators already deal with accessing their delivery destination. Operators could have a distribution center on the ground, where packages are transferred to trucks, or delivery services such as Uber or Google Express. Alternatively, the drone operator could find additional pathways, across smaller stretches of private property, on an agreement-by-agreement basis.

5. How Is Flight On The Rail Line Managed?

One criticism of flying drones at low altitudes is that there is no system of air traffic control in place to prevent drone collisions.⁷⁰ This danger can be overcome, either by a single controlling drone operator, or by a third party company that has purchased exclusive property rights and charges tolls for access. The first to the market has a serious advantage, and it could unfold in many ways. One drone operator may be able to own the exclusive rights to a particular rail corridor - similar to the way railroads have always operated. Or an entrepreneurial technology company might beat the drone operators to the chase, purchasing the rights to railroad corridor airspace, inventing a system to meter usage, and open the railroad airspace to all drone operators on a pay-for-use basis - something akin to a toll road or Internet

70. See Adam Clark Estes, *7 Reasons Why Drone Delivery Service Won't Work (Yet)*, GIZMODO (Nov. 30, 2015, 1:20 PM), <http://gizmodo.com/7-reasons-why-drone-delivery-service-wont-work-yet-1745250109>.

connection.

CONCLUSION

The logical link between freight trains and drones is that they both transport freight, and it is the existing freight transportation that relates back to the surface land. While there are “avigation” easements,⁷¹ whereby a surface land owner commits to forgo claims of nuisance or interfere with airspace, an affirmative property right to travel at low altitudes over land does not seem to exist under either California or federal law.

Using a railroad as a drone corridor has major business benefits - increased efficiency, increased safety, and regulatory arbitrage. It also has major legal benefits based on the railroad’s private property rights, and its ability to fill a void in state and federal law. In one piece of legislation the entire corridor could become accessible to drone travel, connecting distant locations. If drone operators, technology companies, and entrepreneurs embrace the challenges of this uncharted territory and seize the business opportunities, then railroads will likely be all aboard.

71. See Fed. Aviation Admin. Airport Div., *Surface and Overhead Avigation Easements*, FAA.GOV (Sept. 2012), https://www.faa.gov/airports/central/airports_resources/media/RPZeasement.pdf; see also CAL. PUB. UTIL. CODE § 21669.5 (West 2012).

