UT LAW CLE THE UNIVERSITY OF TEXAS SCHOOL OF LAW

PRESENTED AT

29th Annual Land Use Conference

April 10-11, 2025
Austin, Texas

Eyes in the Sky, Feet on the Ground: A Municipal Framework for Emerging Commercial Drone Delivery Technologies

Emily Bowlin

Eyes in the Sky, Feet on the Ground:
A Municipal Framework for Emerging Commercial Drone Delivery Technologies

By: Emily Bowlin

When one thinks of drones, a variety of images may come to mind. These may include military surveillance drones hovering above, gathering intelligence in remote areas, or the high-tech drones employed by companies like Google to map the earth. Perhaps the image is of small, toy-like drones that we purchase for our children to fly in the backyard, or even the drones now used in light and firework displays. The images we associate with drones are as varied as the technology itself.

Drone technology has evolved rapidly, and its presence is expanding in ways we may not have imagined only a decade ago.[1] As commercial drone delivery operations begin to roll out across municipalities around the state,[2] many of us are starting to see how drones will become a part of our everyday lives. Soon, instead of just thinking about drones for entertainment or high-tech uses, we might also think about them delivering groceries, prescriptions, or other essential items right to our doorsteps.[3]

Municipalities are grappling with challenges in finding the balance between fostering innovation and safeguarding public safety and property owner rights. The integration of drones into urban landscapes presents both exciting opportunities and complex regulatory hurdles. This paper provides a brief background on the emerging field of commercial drone delivery technology and explores a case study of local commercial drone delivery regulations within the Dallas-Fort Worth metroplex. This case study demonstrates how local governments have navigated the complex regulatory landscape thus far, analyzing the successes and potential pitfalls of recently enacted regulations.

I. Current State of Commercial Drone Delivery Technology

According to *Forbes*, we are "about to witness the normalization of drone delivery",[4] signaling a transformative shift in how goods are transported and delivered across the globe. Commercial drone delivery has rapidly emerged as a "multi-billion dollar industry", with forecasts indicating exponential growth over the next decade.[5] This technology is not only revolutionizing logistics in developed nations but began and continues to gain momentum in regions with less developed ground infrastructure.[6] In

---

[1] PricewaterhouseCoopers, *Drone Deliveries: Taking Retail and Logistics to New Heights*, PwC, https://cee.pwc.com/drone-powered-solutions/drone-deliveries-taking-retail-and-logistics-to-new-heights.html (last visited Mar. 1, 2025).
[2] Dan Solomon, *Delivery Drones Are Coming to Dallas-Fort Worth*, *Texas Monthly*, https://www.texasmonthly.com/news-politics/delivery-drones-dallas-fort-worth/ (last visited Mar. 1, 2025).
[3] *Id.*
[4] Timothy Papandreou, *Beyond the Hype: Drone Delivery Takes Flight in 2024*, *Forbes*, https://www.forbes.com/sites/timothypapandreou/2024/03/13/beyond-hype-drone-delivery-takes-flight-in-2024/ (last visited Mar. 1, 2025).
[5] *Id.*
[6] *Drone Delivery Picks Up in Africa as Jumia Pairs with Zipline*, *Reuters*, https://www.reuters.com/world/africa/drone-delivery-picks-up-africa-jumia-pairs-with-zipline-2022-09-01/ (last visited Mar. 1, 2025).

fact, “the emerging use of commercial drone delivery is happening . . . particularly in poor regions of Africa and Asia.”[7]

Drones present a cost-effective and efficient solution to the logistical challenges posed by poor road conditions, long travel distances, and the inability to reach remote or rural locations.[8] By bypassing these physical barriers, drones enable faster delivery of critical goods such as medical supplies, food, and emergency relief, often reaching destinations in a fraction of the time it would take traditional delivery methods.[9] The ability to rapidly respond to emergencies and deliver essential items is one of the most impactful advantages of commercial drone delivery technology. In urban areas, the use of this technology may even lead to a reduction in traffic congestion, alleviating pressures on crowded transportation networks.

Environmentally, drones represent a sustainable alternative to traditional delivery vehicles. When you “compare drone delivery with other vehicles, [it] show[s] that energy per package delivered by drones (0.33 MJ/package) can be up to 94% lower than conventional transportation modes . . . .”[10] This eco-friendly approach is gaining attention as part of the broader trend toward sustainable logistics.[11] “According to calculations, 14,000 daily deliveries are expected to result in 5 million business-to-consumer drone deliveries worldwide in 2024. This number is projected to soar to 808 million within ten years.”[12] As this technology continues to scale, the impact on global delivery infrastructure will be profound.

Municipalities are also using drone technology for a variety of practical applications in law enforcement and public safety. Drones are being deployed by police departments for surveillance, search and rescue operations, and crime scene monitoring.[13] The ability to gather real-time data quickly and efficiently enhances law enforcement safety and improves response times during critical incidents.[14] Local permitting departments are using drones for building inspections, offering a more efficient alternative to manual inspections.[15] Drone inspections can reach hard-to-access areas which not only speeds up the inspection process, but also ensures the safety of inspectors.

---

[7] Timothy Papandreou, *Beyond the Hype: Drone Delivery Takes Flight in 2024*, *Forbes*, https://www.forbes.com/sites/timothypapandreou/2024/03/13/beyond-hype-drone-delivery-takes-flight-in-2024/ (last visited Mar. 1, 2025).
[8] PricewaterhouseCoopers, *Drone Deliveries: Taking Retail and Logistics to New Heights*, PwC, https://cee.pwc.com/drone-powered-solutions/drone-deliveries-taking-retail-and-logistics-to-new-heights.html (last visited Mar. 1, 2025).
[9] Timothy Papandreou, *Beyond the Hype: Drone Delivery Takes Flight in 2024*, *Forbes*, https://www.forbes.com/sites/timothypapandreou/2024/03/13/beyond-hype-drone-delivery-takes-flight-in-2024/ (last visited Mar. 1, 2025).
[10] *The Role of Drones in Public Health: A Systematic Review*, *PubMed Central*, https://pmc.ncbi.nlm.nih.gov/articles/PMC9403403/ (last visited Mar. 1, 2025).
[11] Kevin O'Marah, *Supply Chain Drones: Novelty or News?*, *Forbes*, https://www.forbes.com/sites/kevinomarah/2024/06/20/supply-chain-drones-novelty-or-news/ (last visited Mar. 1, 2025).
[12] PricewaterhouseCoopers, *Drone Deliveries: Taking Retail and Logistics to New Heights*, PwC, https://cee.pwc.com/drone-powered-solutions/drone-deliveries-taking-retail-and-logistics-to-new-heights.html (last visited Mar. 1, 2025).
[13] *Police Drones: Enhancing Public Safety and Efficiency*, *Axon*, https://www.axon.com/resources/police-drones (last visited Mar. 1, 2025).
[14] *Id*.
[15] *7 Ways Drones Make Building Inspections Faster, Cheaper, and Safer*, *CTL Engineering*, https://ctleng.com/7-ways-drones-make-building-inspections-faster-cheaper-safer/ (last visited Mar. 1, 2025).

Title search: Eyes in the Sky, Feet on the Ground: A Municipal Framework for Emerging Drone Technologies

First appeared as part of the conference materials for the
29th Annual Land Use Conference session
"Eyes in the Sky, Feet on the Ground: A Municipal Framework for Emerging Drone Technologies"