



NAVIGATING THE GIVEN EXTERNAL CONSIDERATIONS COMMERCIAL DRONE DELIVERY: A SOLUTION TO LAST-MILE LOGISTICS

by Catriona Henderson & Matt Warner

Takeaways

- Drone technology offers unique long-term logistical benefits when properly integrated
- Opportunities for cost savings and greater efficiency, but less environmental impact are unmatched by other disruptive innovations
- The regulatory and technological hurdles, however, can only be overcome with progressive strategies and expert industry knowledge



While the drone industry is far from maturity, the good news is that the freight and logistics sector, due to its unique symbiosis with drone technology, is in a privileged position at the forefront of the integration of unmanned aerial systems (UAS), helping to determine what shape the industry will take when it comes of age. A focus on the nexus between law, logistics and economics highlights the short-term hurdles that can be overcome, and long-term opportunities that can only be realized, with strategic planning and expert industry knowledge.

Commercial prospects: The benefits and drawbacks of drone logistics

Relief from last-mile costs

Last-mile logistics connects regional distribution centers, or “transportation hubs”, to the final destination. It caters for the movement of individual packages to specific locations and necessitates significant flexibility and a large fleet size to fulfill this task. It is therefore no surprise that the last mile accounts for 53 percent of the total costs of shipping globally. Of that, a considerable chunk can be attributed to the labor costs in developed markets as a result of last-mile logistics. This is only exacerbated in rural areas where the sparse population increases inefficiencies and loss in productivity while consumers maintain the same demands and expectations as those in urban areas.

A study in 2016 carried out a cost analysis of Amazon Prime’s drone delivery scheme, with predictions that, compared to a U.S. postage company delivery van in a mid-sized U.S. city, drone delivery could slash costs by one-third on the busiest days of the year, with the emphasis placed on labor cost savings. However, considerable technological hurdles have yet to be overcome before autonomous drone flights using “detect-and-avoid” software are possible, and until then we would merely be replacing delivery drivers with remote pilots. As a result of the lack of safe and developed technology, the typical regulatory position places further, complex limits on the beyond visual line of sight (BVLoS) operation of drones, hindering the range of these delivery systems almost to a point of uselessness. Until technological progress can stimulate regulatory confidence in autonomous drones, the fantasy of a dramatic reduction in labor costs will remain just that – a fantasy.

It is clear that commercial drones have the potential to carve out a new model of profitability by slashing costs, with some studies estimating a five to 10 year horizon for this technology to become viable. However, one must be cautious not to place too much emphasis on these so far fantastical promises without considering the technological and legal hurdles yet to be navigated. On the flipside, neglecting a long-term strategy could leave companies in the dust of their competitors and prove fatal.

Market demand for faster delivery

Next-day delivery is fast becoming the industry standard and same-day delivery is also becoming more widespread. 25 percent of people would pay significant premiums for next- or same-day delivery. This is intensifying pressure on the logistics market to adopt increasingly faster delivery systems to remain competitive. Drones look to be a viable option – for example, Amazon’s sandbox drone scheme in the UK was able to deliver a package in 13 minutes in rural Cambridgeshire.

The urgent demand for faster delivery extends beyond the commercial sector into the public sphere. The COVID-19 pandemic illustrated the need for a more efficient system of transporting key medical supplies, especially between rural hospitals that lack the infrastructure for fast transport. The NHS in the UK, for example, responded to this in the remote Scottish Highlands by partnering with Skyport to enable two hospitals to exchange urgent medical supplies by drone – this would have been impossible by land, even using the fastest means of delivery possible.

A common thread amongst this is one of the most fundamental problems facing regulators and operators currently. The rural-urban divide reflects key safety concerns regarding drones and their ability to integrate within our technological ecosystem without causing unnecessary harm or disruption. As a result, current regulatory limitations in the United Kingdom, European Union and United States restrict how close drones can fly to people. This limits the possibility of introducing drones into urban areas in the near future and so significantly diminishes the usefulness of this technology. Close legal and commercial attention must be paid to the integration of enabling technologies such as traffic management systems in order to maintain safeguards without stifling innovation.

Environmental benefits for urban freight logistics

Cities make up 70 percent of the world's greenhouse gas emissions, with 5.5 percent of total emissions caused by the transport sector. The environmental impact of logistics is most concentrated in urban areas as a result of not just direct emissions from large fleets but the knock-on, indirect effect of increased fleet sizes on congestion, which is exponentially damaging. With this in mind, it is clear that the logistics sector needs to go further than just using more efficient or electric vehicles and look to disruptive innovations to alleviate their contribution to the sector's indirect impact on the environment.

It does not take much to appreciate that using the low-altitude airspace, free of the threat of further congestion, appears to be the most feasible means of alleviating the pressure on urban infrastructure and thus the environment. Other methods, which have not been mentioned in this article, including robot delivery and collection points, fail to address the greater pressures placed on the highway infrastructure by increasing the volume of vehicles already on the road with that of delivery robots and the need to travel to collection points, likely in some sort of road vehicle. Drones provide the best long-term solution

to the infrastructure issues associated with urban sprawl, which will only worsen as the populations of megacities and large cities continue to grow. Drones, most of which are battery-powered, also alleviate the direct impact on the environment by reducing the fuel consumption of logistics companies.

What must be addressed are the current limitations to this seemingly obvious solution. Primarily, and somewhat ironically, one of the major limitations to alleviating the stress on road infrastructure in cities is the lack of infrastructure for drones. Urban development strategies have largely operated independently from the development of disruptive innovations like drones and have yet to construct charging stations and other infrastructure necessary to integrate drone delivery. With that in mind, it is essential for innovators and urban planners to develop long-term strategies to properly integrate widespread drone delivery.

Drone logistics is worth the investment

Drone technologies are far from maturity but to ignore them in their infancy would be to potentially miss out on the most important and ground-breaking technologies of the early twenty-first century for those in logistics and beyond. There is a significant lack of regulatory confidence in current drone technology, but this can be offset in the long term by innovations that could safely integrate drones into everyday life. Drone integrated airfreight poses a real opportunity to revolutionize the ability to generate profit, meet customer demand and alleviate pressure on the traditional road network used in last-mile logistics for urban delivery, which is only causing more and more harm to the environment.



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