UPS Tests Truck-Launched Drone Delivery With Workhorse

Launching from trucks to cut miles driven on rural roads could make economic case for delivery drones

Aviation Week
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Of the myriad possible uses for small unmanned aircraft, the one that has captured and held public attention is package delivery. This has more potential to bring drones into everyday life than any other near-term use.

But how near term? The vision of package-toting drones crisscrossing neighborhoods delivering online purchases to doorsteps, or shuttling between offices in cities carrying urgent mail, must first overcome technical, regulatory and acceptance hurdles.

Package-carrying unmanned aircraft are already a reality where the risk is low and payoff high, in humanitarian terms—delivering blood for transfusions to remote clinics in Rwanda, and tuberculosis-test kits from isolated villages to a central laboratory in Madagascar.

Payoff in monetary terms is more distant, but testing of consumer deliveries is active: Flirtey with 7-Eleven in the U.S. and Domino's Pizza in New Zealand, Google's Project Wing with Chipotle in the U.S., Amazon in the UK, Deutsche Post DHL in Germany, and online retailers JD.com in China and Rakuten in Japan.

Now package delivery giant UPS has demonstrated how a truck-launched UAV could help its drivers, particularly in rural areas where its distinctive brown "parcel cars" must travel miles between deliveries. By avoiding some of the challenges of urban and residential operations, the truck-based approach could make drone deliveries a reality sooner.

https://www.youtube.com/watch?v=TYBu2glKHTA

A Feb. 20 demo in Lithia, Florida, was conducted with Workhorse Group, a manufacturer of hybrid-electric delivery vans that is developing the HorseFly truck-launched UAV. The company, which is building a fleet of 325 electric trucks for UPS, began flight testing its delivery drone with the University of Cincinnati in 2014.

Workhorse CEO Stephen Burns says the HorseFly is designed around the driver. The UAV sits on the roof and has a cage that is loaded from inside the truck by the driver. A preprogrammed route to the destination is loaded via touch screen, and the UAV launches and flies to the drop-off point autonomously while the driver continues along the delivery route.

After dropping off the parcel, the UAV reacquires the truck and flies back to land on the roof and recharge from the hybrid-electric vehicle's batteries. The octocopter HorseFly can fly for 30 min. and carry a load of 10 lb. or less. Currently, a truck carries one drone, but Workhorse is looking at how to enable "rolling warehouses" to operate up to five.

For the UPS demo, the drone remained within line of sight, and a visual observer was present as a safety backup to comply with FAA rules. But in Workhorse's concept, a video feed from the UAV as it descends to its destination is sent to a secondary pilot to assess whether it is safe to complete the delivery. A single remote observer can monitor multiple vehicles.

Credit: UPS

As demonstrated by UPS and Workhorse, the truck-based approach appears to overcome many of the hurdles to drone delivery. Using UAVs in rural versus residential areas minimizes the risks of overflying people and buildings. Flying from a truck versus a warehouse minimizes the distance flown so the UAV can operate within existing line-of-sight rules.

Rules allowing extended line-of-sight operations in less-populated areas, out to 3-5 mi., are expected within the next year and would make truck-based drone delivery even more viable. And UPS is on the drone advisory committee helping the FAA shape those rules.

UPS is famed for its focus on efficiency, shaving seconds off each delivery to save time across its network. And the company makes clear the economics of efficient delivery: With 66,000 delivery drivers on the road each day, 1 mi. saved per driver per day is worth $50 million a year.

“Rural delivery routes are the most expensive to serve due to the time and vehicle expenses required to complete each drop-off. In this test, the drone made one delivery while the driver continued down the road to make another,” says UPS. Workhorse says the HorseFly costs just $0.01 per mile in electricity.

UPS makes clear the goal is efficiency, not replacing its drivers (which could help public acceptance of the service). “Our drivers represent the brand. They provide the service to our customers,” says Mark Wallace, senior vice president of global engineering and sustainability. “This technology is about efficiency for our drivers, to give them assistance in rural areas and harder-to-reach locations.”