

# Tech In The News

## Assignment: DRONE DELIVERY



**Headphones Needed:**       **YES**                       **NO**

Step One:

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Step Two:

Read the Article at the bottom of this document  
Review the information

Step Three:

With a partner, in a Word/GDoc list the 5W's of the story.  
List 5 pros and 5 cons of using this technology, and list locations where this technology could be used, and where it would not be a great idea.

Step Four:

List 5 products that could be delivered via a drone. (Like pizzas)  
List 5 products that could **not** be delivered via a drone. (Like babies)

Submit Your

DRONES-Yournames

Assignment :

To Mr. Amerikaner  
Using:

Gdrive



## BUSINESS

# Could drone deliveries help the environment? Let's unpack that



Drones delivering packages could help reduce greenhouse gas emissions — depending on how and where they're deployed. Above, a Wing Hummingbird drone. (Michael Shroyer / Associated Press)

By SAMANTHA MASUNAGA  
STAFF WRITER

NOV. 17, 2019  
5:15 AM



In the era of e-commerce, it takes a single click to order anything you'd like. But it takes a lot of energy to bring it to your door.

Items are shipped from factories, shuttled between warehouses and finally trucked to your home. This convenience comes at an environmental cost — transportation accounts for [29% of U.S.](#)

[greenhouse gas emissions](#), with medium- and heavy-duty trucks accounting for nearly a quarter of that.

Technology enables this problem — and some will tell you that technology can help solve it.

Drones have been touted as a clean, fast way to appease our demand for quick deliveries. When Amazon.com Inc. unveiled a new design in June for its Prime Air delivery drone, it framed the initiative as part of its vision to make half its shipments net zero carbon by 2030. Wing, a division of Google parent Alphabet Inc., [heralded its service](#) as helpful in easing greenhouse gas emissions. After UPS first publicly flew a drone from the top of a delivery truck to drop off a package at a home, an executive called the test [a “big step”](#) toward reducing UPS’ emissions.

Drone delivery operations could indeed be more environmentally friendly than trucks, according to two recent studies. But that depends on how and where they are deployed.

## Where they plug in

Small drones have a lower environmental impact than ground-based delivery methods, including diesel trucks, trucks powered by natural gas or even electric vans, according to [a study](#) published last year in Nature Communications. But drone batteries need to be charged, and that power has to come from somewhere.

For drones to live up to their green potential, plugging into clean power sources is vital. Access varies from state to state and from utility to utility.

Thanks to solar power, California [frequently generates more electricity than people can use](#). The study in Nature Communications concluded that a one-pound package delivered by a small drone in California would reduce greenhouse gas emissions by 54% compared with a diesel truck. The same delivery in Missouri, which gets most of its electricity from coal, would result in a reduction of just 23%.

“When you have low-carbon electricity and you’re moving small packages, drones could have the lowest carbon footprint per package delivered,” said Costa Samaras, associate professor of civil and environmental engineering at Carnegie Mellon University and a co-author of the study. “It’s much

greener to have a drone flying through the air to deliver you a set of headphones than for you to get in your gasoline-powered car or even your electric car and drive to the store and get it.”

Companies testing commercial drones are already experimenting in regions with varied power sources.

Wing operates commercial drone delivery service in Christiansburg, Va.; Canberra, Australia; and Helsinki, Finland. In Canberra, Wing is powered by nearly 100% renewable energy, while Helsinki uses a mix of nuclear energy, renewable energy and fossil fuels, said Jonathan Bass, Wing’s head of marketing and communications. Virginia, on the other hand, is predominantly powered by natural gas and nuclear energy. All three locations’ power sources are getting cleaner over time, he said.

## **The fewer warehouses, the better**

The longer a drone can stay in the air and deliver packages, the more useful it is.

But drones have much shorter ranges than trucks, and charging stations are far less common than gas stations.

So delivery companies will need a vast network of charging stations. It’s easy to put those stations in warehouses, where the drones go anyway to load up on packages.

Because of our desire for quick deliveries, the nation is already seeing a warehouse boom. One billion square feet of warehouse space was built nationwide over the last decade, with a big boom in the Inland Empire, a [CBRE study](#) found last year.

Building a broader network of warehouses to accommodate drones’ needs would have serious environmental repercussions. More warehouses means more lighting, heating and air conditioning systems, not to mention the energy required to charge drones between flights, all of which add to the overall emissions from the service.

Rather than building new warehouses, drone delivery companies could use existing facilities — for example, drones carrying food could take off from the top of a grocery store. Amazon would be well

positioned to do that, as it already has more than 500 Whole Foods stores and is [experimenting with new grocery concepts](#).

Developing higher-capacity batteries for drones could also help: If drones could fly farther, the network of warehouses and chargers could be less dense. (Currently, drone use in the United States is limited by rules against flying over humans or beyond the operator's line of sight. But those rules are expected to loosen in the years ahead, and some companies already have waivers.)

Another option is deploying drones from delivery trucks when removing a few packages could streamline a driving route. The truck covers much of the distance — then takes a big load of packages one way while a drone carries some the other. Then the drone can meet up with the truck to make other such deliveries and eventually be returned to the warehouse.

[A study](#) published last year in the journal *Transportation Research Part D* concluded that drones are best at delivering a few packages at a time, while trucks are better at taking large quantities to more densely populated areas.

“It's important to remember these modes can be used in complement,” said Anne Goodchild, a co-author of the study and director of the supply chain transportation and logistics center at the University of Washington. “We shouldn't just compare drones versus trucks.”

## Off the beaten path

The logistics industry has inched toward some environmentally minded solutions in urban areas, such as Amazon Lockers, where a single gas-powered truck might drop off packages for dozens of customers. But that approach doesn't necessarily work in rural areas, where residents are more spread out and trucks haul packages to every doorstep.

That's where drones could be a more efficient way to carry packages on the “last mile” of delivery, researchers say, especially since there are fewer obstacles — such as power lines and buildings — for them to avoid.

“A drone can't really compete with a very full truck making 100 deliveries in a fairly small space,” Goodchild said. “The farther apart those customers are, the less room for consolidation, the more

competitive a drone can be.”

But they won't be able to handle everything, at least initially. The current crop of drones envisioned for delivery service are lightweight, meaning they can only carry small, light packages over short distances.

Although drones may end up improving on the traditional ways of delivering packages, they aren't a silver bullet to vanquish the transportation industry's emissions problem. For example, Wing's drones can carry packages of up to 3 pounds, which could replace some trips to the store but not a delivery truck's entire route.

“We do not expect them to replace delivery trucks for delivery of larger items, but rather to make them more efficient,” Wing's Bass said in an email.

Drone delivery is not just a gimmick — companies will use it widely if it saves money, said Tyler Reeb, director of research and workforce development at the Center for International Trade and Transportation, based at Cal State Long Beach.

“It's more of a calculation of risk and expense, with environmental benefits being a nice byproduct,” he said.

*Times staff writer Suhauna Hussain contributed to this report.*

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Samantha Masunaga covers aerospace for the Los Angeles Times. She has previously worked for the Oregonian, the Orange County Register and the Rafu Shimpo, among other publications. A Southern California native, she is an alumna of the UC Berkeley Graduate School of Journalism and UCLA.

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## ***F.A.A. Allows U.P.S. to Deliver Medical Packages Using Drones***

After a year of working with the Federal Aviation Administration, United Parcel Service was awarded a certification that allows it to use drones on medical campuses.

**By Sandra E. Garcia**

Published Oct. 2, 2019 Updated Oct. 3, 2019, 10:12 a.m. ET

United Parcel Service announced this week that it had received a certification from the Federal Aviation Administration to use drones to deliver medical packages at campuses across the country.

The certification will allow U.P.S. to use multiple drones to deliver health care supplies within federal regulations and to fly drones beyond the visual line of sight, according to a statement from the F.A.A.

For the past year, U.P.S. has been collaborating with the F.A.A. flying drones at the WakeMed campus in Raleigh, N.C., delivering medical packages — including blood samples and tissues — to different buildings on the property, according to Scott Price, the chief strategy and transformation officer at U.P.S.

During its yearlong trial period, he said, U.P.S. flew about 1,000 single-operator drone flights at the WakeMed campus.

While U.P.S.'s drone airline, UPS Flight Forward, is currently limited by the certification to operating on medical campuses for the next couple of years, the company hopes to expand after that. "This is the first step to being able to enable deliveries to homes and rural areas," Mr. Price said on Wednesday.

The F.A.A. certification for U.P.S.'s drone airline comes at a time when the United States is making a push to remain at the forefront of unmanned aviation, the agency said. "This is a big step forward in safely integrating unmanned aircraft systems into our airspace," said Elaine L. Chao, the United States secretary of transportation.

So far, the F.A.A. has awarded only one other certificate to fly drones. That was granted to Wing, the drone-delivery unit of Alphabet, Google's parent company. The two certifications are different. Wing is allowed to use only one pilot and one drone at a time, while U.P.S. is allowed to use several pilots and numerous drones simultaneously, said Tammy Jones, an F.A.A. spokeswoman.

Currently the F.A.A. is reviewing requests or indications of intent from six other companies to conduct commercial drone operations, Ms. Jones said.

Other countries have also begun drone deliveries of vital medical supplies. Zipline distributes blood in Rwanda using drones, and Swoop Aero delivers vaccines and other medical supplies in the Pacific.

Drone deliveries have also proved to be economical for U.P.S.

"Delivery by drone is cheaper than the cost of a person driving a car," Mr. Price said.

Amazon has been pushing to deliver packages to its millions of customers by drones for a while. In 2013 Jeff Bezos, the founder and chief executive of Amazon, said in a "60 Minutes" interview that he foresaw drone deliveries for Amazon.

Three years later Mr. Bezos announced that Amazon had made its first drone delivery to a customer, in Cambridgeshire, England.

As for U.P.S., customers in urban areas should not hold their breath for drone deliveries, Mr. Price said. "Use in urban areas," he said, "is not clear."

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