

gation errors and accidents. A number of innovative companies, working with big retailers, are already running pilot programs with autonomous delivery vans. On January 30, 2018, the Silicon Valley start-up Udelv made what it claims to have been the first self-driving delivery for Draeger's Market in San Mateo, California.

The basic concept is that a customer uses a smart app to request a delivery for a certain window of time. Much as Uber does, the app can track the location of the vehicle as it makes its way toward its destination. When the van rolls up to the home, it texts the customer a code and a notice that the package—whether it is groceries, dry cleaning or prescription drugs—has arrived. The person walks up to the van and punches the code into a screen on the side of the vehicle that pops open a door to a storage compartment. Once the package has been retrieved, the door closes and the van drives to the next destination.

Self-driving delivery vehicles come in all shapes and sizes. In early 2019, Amazon let loose six Scout delivery vehicles on the sidewalks of Snohomish County, Washington. The two-toned, baby-blue-and-black, battery-powered devices look like small coolers on wheels. They can travel the sidewalks at a walking pace and avoid pedestrians and pets. The Scouts use an array of sensors to navigate their way across streets and around obstacles. The self-driving delivery bot stops when it recognizes its destination, alerts the shopper by text and pops open its top. When the person picks up the package, Scout closes its lid and **heads back** for its next job. So far, Amazon likes how Scout rolls, and in the summer of 2019, the company decided to expand the program into Southern California.

While the Scout seems to make sense for simple deliveries, it's not yet a good substitute for humans. A robot—at least not yet—can't open gates, climb stairs, ring doorbells or slide a small package safely between a storm door and front door to keep it dry on a rainy day. These vehicles only work when the customer is at home, which limits their usefulness. What if the customer is a no-show? How long does the car wait? Amazon and others believe part of the solution will be to build personal lockboxes where robots can drop packages, but **rolling out** such an infrastructure will take years if not decades. And what happens when some **mischievous kid** tips a Scout over? Or when armies of Scouts jam up city sidewalks? These vehicles might solve the last-mile problem, but they will create a last-50-feet problem.

Not all autonomous delivery vehicles roll along the ground. In 2013, Bezos appeared on CBS' *60 Minutes* and explained to correspondent Charlie Rose how Amazon's drones could deliver a 5-pound package to customers within a half hour. The significance is

that, according to Bezos, some 86 percent of all packages that Amazon delivers weigh 5 pounds or less.

Drones have many positive attributes. Theoretically, they emit less greenhouse gas than gasoline-powered delivery trucks, and they can reach remote areas to deliver crucial medicines. They can help monitor **utility lines** and bring crucial supplies to disaster areas. They can also be used to bring consumers in rural areas more choice at better prices. In China, online retailer JD.com has used a drone to cut the delivery time to a remote mountain village from days to minutes, while slicing the cost dramatically.

In April 2019, the FAA, which regulates U.S. airspace, let Alphabet, the parent company of Google, start a test drone delivery service in Virginia, the first of its kind in the U.S. Amazon soon followed. If drones start frequenting the skies, Amazon can expect **serious blowback** from local communities. Some worry about privacy—are the cameras on the drones being used to spy on people? Drone makers say the cameras are low resolution and only meant to aid in navigation and to improve the drone's performance. That might be the case now, but there's no guarantee that the cameras won't get better and nosier.

The bigger worry is noise. A 2017 NASA study found that heavy road traffic in residential areas is much less annoying than the back-and-forth high-pitched buzz of drones. When Alphabet's Wing division started using drones to deliver hot coffee and food in three minutes or less to customers in the Australian suburb of Bonython, Canberra, the buzzing didn't go over well. Jane Gillespie, a local resident and a member of Bonython Against Drones (BAD), says the drone's loud, **high-pitched whirrs** sound like a "Formula One racing car."

Whether it's a drone, a Scout delivery bot or a full-sized autonomous delivery van, autonomous **delivery conveyances** make more economic sense than human drivers. That means the future lies in self-driving delivery vehicles, and people will need to get used to them plying the streets. At first, these machines will make for some bizarre encounters. In a pilot program in Ann Arbor, Michigan, an autonomous Ford Fusion hybrid was used to deliver Domino's pizza to the front doors of suburban homes. After getting their pizza, some customers, caught on videotape, would say "Thank you" to the car.

It's hard to understand why anyone would do this. Perhaps they were afraid that when our robot **overlords** take over, the first thing they'll do is check the old log files to see who was nice to the robots and who wasn't. **NL**

Brian Dumaine

ADAPTED FROM *BEZONOMICS*

BY BRIAN DUMAINE, PUBLISHED BY SCRIBNER.

#### head back

– skierować się  
gdzieś z powrotem  
**roll out** – rozwijać  
działalność/  
wprowadzać produkt  
na rynek  
**mischievous kid**  
– złośliwy/psotny  
dzieciak  
**utility line**  
– przewód zasilający/  
energetyczny  
**serious blowback**  
– stanowczy  
sprzeciw/  
negatywna reakcja  
**high-pitched whirr**  
– warkot  
(np. latającego  
pojazdu)  
**delivery conveyance**  
– samochód  
dostawczy  
**overlord** – pan,  
władca