

## Curse or Blessing

### Delivery robots on the rise worldwide

Delivery robots are on the rise worldwide. Whether in Estonia, Finland, the UK, the USA, or Saudi Arabia, delivery robots are already in use in specific areas, often leading to amusing and quirky encounters in daily life (see video above). The question arises whether robots could soon be rolling through the cities of Austria and how sensible that would be. Addressing the increasing transportation needs requires logistical solutions.

By Lena Hager

These robots, roughly the size of a bicycle trailer, deliver groceries, packages, and food orders. They travel along sidewalks and pedestrian zones at a speed of about six km/h, cross roads only when the light is green, and avoid oncoming pedestrians. These small robots, reminiscent of Pixar's Wall-E, are already a common sight in some cities, such as Tallinn (see video above), but not yet in Austria.

There are indeed sensible applications, explains urban planner Jonathan Fetka from the Research Area for Traffic System Planning (MOVE) at the Vienna University of Technology, especially in sparsely populated areas. The robots could also be helpful for older or mobility-impaired individuals, such as assisting with shopping transport. However, Fetka questions whether shifting traffic from the road to the sidewalk is a desirable solution.

#### Useful in specific cases

Logistics expert Margaretha Gansterer from the University of Klagenfurt sees robots like those from the Estonian company Starship as useful for the "last mile" – the final segment of a delivery to the destination. The payload is relatively low, resulting in limited range and highly fragmented deliveries. Therefore, they are not currently profitable for companies, according to Gansterer.

Starship's battery-powered sidewalk robots, pioneers in this field, are autonomous devices that transport items like food, hot meals, and packages over short distances at a speed of six km/h. Equipped with sensors and cameras, they can detect objects and people and navigate around them. According to Starship, a single battery charge is sufficient for a day of deliveries, and the transport capacity includes "three shopping bags of groceries."

#### Greater potential with the Mothership method

Gansterer suggests that larger quantities could be transported by autonomous delivery robots on the road, rather than on the sidewalk, citing the vehicles from the company Cleon, which operates in places like Texas, Riyadh, and Tallinn. Such "mobile package boxes" could indeed gain prominence in the future, according to the logistics expert.

Urban planner Fetka also envisions the introduction of such vehicles – initially in closed areas and gradually on the streets. However, he notes that compared to sidewalk robots, the technological challenges are more significant due to higher speeds and integration into traffic.

### **Legal gray area in Austria**

The legal framework is also complex, with delivery robots operating in a legal gray area. In Austria, Austria Tech, specifically the Automated Mobility Contact Point, is responsible for questions related to automated driving. Currently, there are no test drives with automated delivery and sidewalk robots on public roads, according to a statement to ORF Topos.

For the legal classification of sidewalk robots, factors such as weight, size, and speed are crucial. There are no specific regulations for autonomous delivery robots designed for the road, requiring each case to be assessed individually.

### **Half a million packages per day**

"With transport volumes increasing for years, we need to figure out how to handle it," says Gansterer. In collaboration with Belgian research groups, the expert is currently exploring how city logistics concepts can reduce traffic, considering the perspectives of companies, customers, and city administrations.

The relevance of the issue is evident in the growing volume of parcel deliveries. In the past year, the Austrian Post transported 200 million packages, averaging around 548,000 packages per day. In 2019, the number was 127 million.

However, robots are unlikely to handle this volume quickly. According to the Austrian Post, delivery personnel will remain central. Autonomous delivery vehicles and drones are seen as supporting rather than replacing human delivery. In city logistics, e-bikes, e-mopeds, and other smaller e-vehicles are increasingly being used, along with self-service stations as useful tools.

### **Solutions are on the table**

What could a comprehensive, efficient, and sustainable logistics concept for cities look like? "There are already enough ideas and technologies on the table that we could implement," says urban planner Fetka. However, he does not see automated delivery robots as a solution to fundamental questions of spatial distribution.

"We need to reduce routes and road space occupation and bundle deliveries. Yet, many companies still plan their own routes through the city," says urban planner Jonathan Fetka.

Interesting projects are underway, especially in Italy. "Before trucks make individual tours through the city centers, goods are unloaded in micro-hubs – small warehouses – and then delivered with low-emission vehicles." Last-mile cargo bikes could also be utilized. Similar approaches exist on a smaller scale in Austria, for example, in Graz and Klagenfurt.

### **Collaboration instead of individualism**

Collaborative logistics is a significant topic in research, explains Gansterer. Companies exchange regional transport orders among themselves, making deliveries more efficient. This could eliminate situations where three different transport companies park consecutively on a

street. Increased efficiency could lead to higher profits, according to Gansterer, who sees great potential in this concept.

The major obstacle lies in the competitive situation, with companies reluctant to exchange data. "Therefore, we are developing mechanisms to share as little information as possible," says the researcher.

### **City as a contested space**

In the city, various uses and needs collide in a very limited and contested space, Fetka explains. The urban planner emphasizes the importance of considering this in spatial distribution. This involves social aspects, adaptation to the changing conditions of the climate crisis, and the supply of goods to the city.

A significant problem in urban freight traffic is the lack of cost transparency, notes the urban planner, referring to associated CO2 emissions. As part of the research project "TRACE," Fetka collaborates on pilot projects in Slovenia, Italy, and Greece, exploring international possibilities for automated delivery vehicles. City compatibility criteria play a crucial role, aiming to "improve things where it really matters" rather than simply adopting a technology.

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