



Self-driving vehicles: the road to cheaper, sustainable urban transport in Europe

The future of urban mobility is near. EU-backed trials of driverless cars in public transport could make Europe's city centres affordable, cleaner, safer, more efficient, inclusive and fair.

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In Groruddalen, a large urban valley in north-eastern Oslo, Norway, the groundwork is being laid for an important shift in city transport.

Five self-driving electric cars began ferrying the public around the area in early February 2025. This marks a key milestone in an EU-funded initiative to integrate automated vehicles into public transport systems.

The Norwegian launch is the first of three planned as part of the ULTIMO initiative. The research team aims to lay the foundations for the world's first large-scale, on-demand, autonomous-vehicle public transport services.

The greening and digitalisation of the transport sector is a key policy objective of the EU, which is investing €500 million in a public-private partnership on cooperative, connected and automated mobility (CCAM).

The aim is to develop citizen-centric, safer, environmentally friendly and inclusive public transport options, while also providing important new opportunities for European industry.

On-demand urban transport

The other two trial services are expected to start later this year, in the town of Herford in northwest Germany and in the Greater Champagne district in the canton of Geneva, Switzerland.

The ULTIMO team brings together transport technology companies and associations, transport authorities, manufacturers, universities and consultancies from seven EU countries, plus Norway and Switzerland. These include the International Association of Public Transport, Siemens and Capgemini, among others.

The collaboration, set to run until September 2026, will create an economically sustainable model for “demand-responsive” automated vehicles for transporting people and urban goods. This means that, unlike unmanned subways that only follow their predefined line, for example, routes may vary in response to requests from passengers.

The key feature of demand-responsive automation is that vehicles are fully autonomous within clearly defined designated areas like Groruddalen. The system relies on 3D maps, radar, cameras and connected infrastructure for decision-making.

“We are talking about integrating shared autonomous vehicles as part of public transport,” said Christian Willoch, executive adviser for radical innovation at Ruter, the Oslo public transport authority.

The new automated systems will use electric vehicles. This should significantly reduce the environmental impact of road transport, estimated to be responsible for nearly a quarter of global energy-related CO2 emissions, according to UN data.

Better connections

The push towards the integration of automated transport into public transport systems is being seen all over the world.

The EU is a leading player in CCAM research, which it supports through public-private partnerships and EU-funded research and development initiatives like ULTIMO.

Through these efforts, the momentum is building to set up on-demand public transport services and eventually integrate different public and private mobility options into a single digital platform to better meet the needs of residents in cities, or even regions.

Just the beginning

Following an initial trial to gauge user experience, ULTIMO has rolled out its app for public use in Oslo. It allows passengers to book and share a luxury electric SUV – the Nio ES8 – retrofitted with self-driving technology.

The researchers’ intention is to add other makes of vehicles into the mix, particularly European-made, as the service becomes more established. There is currently no charge to users, as part of the research being carried out is to assess pricing strategies.

Willoch said that initial feedback is very positive, but acknowledges that the potential fleet of 10 to 15 cars by the end of the project will need to be significantly scaled up to function as a real public service.

“We believe that to have an impact in our area and get people to reconsider using their private car, we may need around 500 vehicles,” he said. The scaling-up should also bring prices down.

“Our calculations show that with scale, we will achieve a price per passenger kilometre that’s lower than for private cars.”

Game-changer for urban mobility

Andreas Fehr, a consultant on autonomous driving at DB Regio Bus, a regional bus subsidiary of the German railway company Deutsche Bahn, is responsible for coordinating much of the work being carried out by the ULTIMO partners.

He believes that if such on-demand autonomous vehicle systems can be effectively deployed in the long term, they will be game-changers for public transport. But he acknowledges that a number of challenges remain.

At present, the vehicles being used still have a human safety operator on board. This already reduces human error, provides faster reaction time and more consistent driving behaviour, while still having human backup for complex situations.

Longer term, the aim is to have no safety operator, but it would require further advances in autonomous vehicle technology, with enhanced sensors and the ability to handle unexpected events. Comprehensive remote monitoring technology combining human supervision and AI software would also need to be in place.

It will also require automated in-vehicle services to meet safety requirements of the passengers, as there will no longer be a driver.

Remote monitoring will allow real-time insights and 360-degree view of road conditions, while still allowing humans to intervene when necessary.

Another challenge is the need to create standardised autonomous vehicle systems for public transport, which would make it easier to coordinate different services with one another and with traditional public transport options.

“We’re having detailed conversations with the different manufacturers to understand the basic information we can build on to create mapping and API standards,” said Fehr, referring to application programming interfaces, which comprise connections between computers or their programmes.

Part of the mission the ULTIMO team has been funded to deliver is to make mobility more accessible for those with fewer public transport options available.

“It’s a big opportunity to provide increased mobility for people who need it,” said Fehr. He hopes the models that the team comes up with will lead to sustainable change in urban and suburban mobility, as well as to better access to transport in rural and less populated areas.

“It will hopefully motivate more people not to use or buy their own car, but to use shared-mobility on-demand public transport,” he said. “That’s the type of sustainable transformation we need as a global society.”

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