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Singapore university partners Volvo to pilot full-size autonomous electric bus

Just over a year after first announcing plans to collaborate, Singapore's Nanyang Technological University and Volvo Buses have launched a driverless electric bus stretching 12 metres long and able to accommodate 80 passengers.



By Eileen Yu for [By The Way](#) | March 5, 2019 -- 07:25 GMT (15:25 GMT+08:00) | Topic: [Artificial Intelligence](#)



Singapore's Nanyang Technological University (NTU) and Volvo Buses have unveiled a full-size autonomous electric bus that stretches 12 metres long and can accommodate up to 80 passengers. The single-deck Volvo 7900 Electric bus is part of a scheme under the Land Transport Authority (LTA) to develop and run driverless bus trials for fixed route and scheduled services.

The vehicle is equipped with sensors and navigation features that are managed by an artificial intelligence (AI) system, according to an [NTU statement](#) released on Tuesday. It added that the AI system is integrated with cybersecurity and firewall measures to safeguard against potential attacks.

The electric bus sports 36 seats and boasts "zero emissions", consuming 80 per cent less energy than an equivalent sized diesel bus, NTU said. The Singapore university in January last year had announced plans to [jointly develop autonomous electric buses with Volvo](#).

The launch marked the first fully autonomous electric bus Volvo had introduced for a public transport system globally. In addition, the vehicle was the first of two that had gone through preliminary rounds of tests at NTU's Centre of Excellence for Testing and Research of Autonomous Vehicles. Located on the NTU Smart Campus, the [test centre](#) replicates Singapore's urban road conditions, such as traffic signals, multiple bus stops and pedestrian crossings, and tropical conditions such as driving through heavy rain and partially flooded roads.

The autonomous bus would eventually be put to the test on the roads of the university's campus as well as outside NTU.

The second Volvo 7900 bus will be tested at a bus depot operated by Singapore's public transport company SMRT, which will assess the vehicle's ability to autonomously navigate into vehicle washing bays and park safely at charging areas. The transport operator also will evaluate the ability of autonomous vehicles to run safely on public roads.

LTA in October 2016 said it would be piloting the use of self-driving buses alongside NTU as well as jointly conducting research to improve real-time monitoring of Singapore's rail networks, so potential defects could be identified more quickly.

NTU's president Subra Suresh said: "This fully autonomous electric bus will play a role in shaping the future of public transportation that is safe, efficient, reliable, and comfortable for all commuters. It will soon be tested on the NTU Smart Campus, which has been home to a number of innovations as a living testbed for technologies that impact the human condition and the quality of life."

LTA's chief innovation and technology officer Lam Swee Shann said the launch was aligned with Singapore's aim to roll out autonomous vehicles in order to improve accessibility and connectivity for local commuters.

The autonomous bus runs on Volvo's Autonomous Research Platform, which is integrated with key controls such as the navigation system and multiple sensors, including light detection and stereo-vision cameras that can capture images in 3D. It also operates a global navigation satellite system that taps real-time kinematics, using multiple data sources to establish a location accuracy of up to one centimetre, according to NTU.

The bus also has an inertial management unit that can measure the vehicle's lateral and angular rates, which the university said helps improve navigation when the vehicle is on uneven terrains or moves around sharp bends.

NTU researchers had developed the AI system that manages the data sensors and GPS systems on the bus.

Electric vehicle charging technology vendor ABB also developed a fast-charging system for the buses, which it said was able to recharge a battery between three and six minutes.