NTU Singapore and Volvo sign cooperation agreement for development of autonomous electric buses

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The aim is for the autonomous buses to charge their batteries, drive through the depots to the vehicle wash and park - entirely autonomously.

Nanyang Technological University, Singapore (NTU) has signed a cooperation agreement with Volvo Buses to collaborate on a research and development program for autonomous electric buses.
The program is part of the **Land Transport Authority (LTA) of Singapore’s drive** to create new solutions for tomorrow's sustainable public transport. Smart Urban Mobility, by leveraging data and digital technologies, including artificial intelligence and autonomous vehicles, to further enhance the public transport commute, is one of the **key strategic Smart Nation projects**. The planned deployment of self-driving buses in several areas of the country by 2022 has been **announced**.

For Volvo, this will be its first autonomous application in public transportation and it has chosen NTU as its partner in this endeavour. Volvo has already demonstrated the autonomous technology in mining, quarry and refuse collection operations.

The 12-metre Volvo 7900 electric bus is already operating around the world, but the buses to be deployed in Singapore will be equipped with autonomous driving technologies. This include GPS and LIDAR [1] technology-based system for charting, positioning and scanning the area around the vehicle.

Fast-charging stations based on the common **OppCharge** interface will be supplied by **ABB**. The OppCharge interface is well suited for autonomous charging solutions in bus depots as well as in running traffic. The charging station is capable of providing 300kW of charging power in three to six minutes, during the layover times at the bus route’s end points.

One of the autonomous electric buses will be used on Singapore's advanced new test facility for autonomous vehicles, CETRAN (Centre of Excellence for Testing and Research of Autonomous Vehicles), **opened** in December 2017. Here, in a fenced-off area NTU's researchers will be able to test new functionality and study how the bus interacts with other road-users in various conditions.

The second bus will be used for tests in the bus depot in partnership with the public transport operator **SMRT**. The aim is that tomorrow's autonomous buses should be able to charge their batteries, drive through the depots to the vehicle wash and park - entirely autonomously.

The cooperative programme between Volvo Buses and NTU is underway and will initially last for two years. The jointly developed autonomous electric buses are expected to arrive into Singapore in the beginning of 2019.

**NTU President Professor Subra Suresh,** said, “Industry-academic connections are key in nurturing an environment which promotes innovation, research excellence, and technological change for a better tomorrow. NTU takes pride in its strong industry connections, and this partnership with Volvo will pave the way for future mobility solutions by developing and testing autonomous buses right here on campus. These solutions will further strengthen Singapore's vision of embracing autonomous vehicle technologies and enhance public transportation.”

“We are seeing fast-growing interest in both autonomous and electric vehicles in cities all over the world. Together with NTU, one of the world's leading universities of technology, we now have the possibility of testing various solutions under realistic conditions in a major city that has high ambitions for its public transport,” says **Håkan Agnevall**, President Volvo Buses.
Mr. Desmond Kuek, President and Group Chief Executive Officer, SMRT Corporation, said, “Our goal is to stay future-ready by keeping abreast of latest land transport solutions for safe, efficient and comfortable journeys, and adapt such urban mobility solutions to Singapore’s unique operational setting. This MOU paves the way for SMRT, working with our partners, in hosting operational trials for autonomous buses, and the command & control system required for operating such smart vehicles. SMRT will leverage on decades of experience in operating and maintaining buses to lead the operational testing and evaluation of autonomous buses for their eventual safe deployment on our roads.”

“The Land Transport Authority fully supports innovation and cutting edge technology that will ultimately benefit commuters. The agreement to develop and trial electric autonomous buses is a significant milestone in our journey to make this a reality in Singapore’s public bus network,” commented LTA’s Chief Innovation and Technology Officer Mr. Lam Wee Shann.

NTU has been highly involved in smart mobility initiatives in recent years. For instance, Singapore’s first Smart Mobility consortium was launched in January 2017 to test new tech on NTU campus, bringing together 12 industry partners. Yesterday, Professor Subra Suresh laid out his vision for transforming NTU into a smart campus. As part of this initiative, there are plans to deploy 22-seater fully electric shuttles, in addition to the driverless electric shuttles that are already being tested on campus. Several 40-seater autonomous buses that support ultra-fast charging are also being developed, together with bus stops that will have the complementary infrastructure.