Would you get on a driverless BUS? Volvo will trial electric single-decker in Singapore that transports passengers using 80% less energy than diesel vehicles

- **The AI-powered bus is 39 feet long and is able to carry eighty passengers**
- **Volvo bus president says it is the first full-sized, autonomous electric bus**
- **It is equipped with an onboard system to protect it from cyber attacks**
- **Singapore built a mini town for testing before trials take place on public roads**

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The world's first full-automated electric driverless bus has been launched by Volvo in a trial taking place in **Singapore**.

The zero-emissions vehicle uses 80 per cent less energy than diesel powered vehicles to transport people around the city-state.

It is hoped that the move will help the city-state take a step forward in the race to deploy autonomous public transport.

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The world's first full-automated electric driverless bus (pictured) has been launched by Volvo in a trial taking place in Singapore . The zero-emissions vehicle uses 80 per cent less energy than diesel powered vehicles to transport people around the city-state

The single-decker 7900 Volvo Electric bus is 39 feet (12 metres) long and has a full capacity of 80 passengers.

The vehicle will begin driving at the campus of Nanyang Technological University (NTU), who assisted in its development.

Trials will then be extended to public roads, a Volvo spokesman said.

In the meantime, the Swedish firm has built a mini-town in the university for testing the driverless vehicles.

It's equipped with intersections, traffic lights, bus stops and pedestrian crossings, providing a real-world environment.

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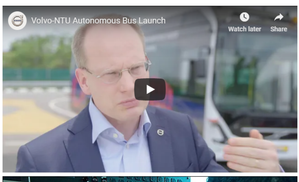
This will be used to assess the vehicle's ability to navigate into washing bays and park safely at charging stations.

Data from the trials will be used to improve the technology and put it through stringent tests before the vehicles are let loose on the road, which is expected as early as 2022.

The vehicle is the 'first full-sized, autonomous electric bus in the world, according to President of Volvo Buses Hakan Agnevall, who dubbed the start of the trials a 'world first'.



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The NTU and Volvo bus is equipped with an AI system that protects it from unwanted cyber attach.

Even a small scale hack of automated cars could cause collisions and gridlock and hinder emergency services, experts from Georgia Tech have warned.

The future of automated cars has been a subject of contention for regulators for the last few years.

However, until now most of the focus has been on preventing individual accidents, seeking to avoid a repeat of the fatal accident when a pedestrian was killed by a self-driving Uber in 2018.

Researchers from NTU will oversee the artificial intelligence aspects of the vehicle.

'We really think that autonomous vehicles can really transform public transport,' Mr Agnevall told **CNBC** on Tuesday.

'It's about safety, it's about operational efficiency, and it's also about creating new opportunities for urban planning.'

HOW DO SELF-DRIVING CARS 'SEE'?

Self-driving cars often use a combination of normal two-dimensional cameras and depth-sensing 'LiDAR' units to recognise the world around them.

In LiDAR (light detection and ranging) scanning - which is used by Waymo - one or more lasers send out short pulses, which bounce back when they hit an obstacle.

These sensors constantly scan the surrounding areas looking for information, acting as the 'eyes' of the car.

While the units supply depth information, their low resolution makes it hard to detect small, faraway objects without help from a normal camera linked to it in real time.

In November last year Apple revealed details of its driverless car system that uses lasers to detect pedestrians and cyclists from a distance.

The Apple researchers said they were able to get 'highly encouraging results' in spotting pedestrians and cyclists with just LiDAR data.

They also wrote they were able to beat other approaches for detecting three-dimensional objects that use only LiDAR.

Other self-driving cars generally rely on a combination of cameras, sensors and lasers.

An example is Volvo's self driving cars that rely on around 28 cameras, sensors and lasers.

A network of computers process information, which together with GPS, generates a real-time map of moving and stationary objects in the environment.

Twelve ultrasonic sensors around the car are used to identify objects close to the vehicle and support autonomous drive at low speeds.

A wave radar and camera placed on the windscreen reads traffic signs and the road's curvature and can detect objects on the road such as other road users.

Four radars behind the front and rear bumpers also locate objects.

Two long-range radars on the bumper are used to detect fast-moving vehicles approaching from far behind, which is useful on motorways.

Four cameras - two on the wing mirrors, one on the grille and one on the rear bumper - monitor objects in close proximity to the vehicle and lane markings.