

# Driverless buses on roads here by 2020

Commuters will be able to hop on to one of two driverless public buses here from October 2020.

The driverless bus will have an all-aluminium body to keep it light and it will be electrically powered.

A consortium led by ST Kinetics, which is building the autonomous buses, expects to unveil a prototype by early next year. It will also launch four driverless on-demand minibuses on Sentosa next year.

The buses will have level 4 autonomy initially – where the bus will be able to drive by itself but will still be manned.

The testing of the buses will cover as many road scenarios as possible before they are rolled out to the public.

---

[SEE TOP OF THE NEWS A7](#)

# Commuters can catch a driverless public bus by 2020

Consortium led by ST Kinetics expects to unveil battery-powered prototype by early next year

**Christopher Tan**  
Senior Transport Correspondent

From as early as October 2020, commuters will be able to hop on to one of two driverless public buses here.

A newly formed consortium led by ST Kinetics, which is building the autonomous battery-powered buses, expects to unveil a prototype by early next year.

The Singapore Autonomous Vehicles Consortium includes the Agency for Science, Technology and Research, National University of Singapore (NUS), Singapore University of Technology and Design, Nanyang Technological University (NTU) and Singapore Institute of Technology.

It will also launch four driverless on-demand minibuses on Sentosa next year.

ST Engineering, ST Kinetics' parent group, announced this yesterday – six months after NTU said it planned to roll out a driverless shuttle between its campus and nearby CleanTech Park by 2018.

ST Kinetics president Lee Shiang Long told *The Straits Times* that the group decided to develop its own autonomous buses because the ones tested here previously “were not working that well”.

“When we were trialling those vehicles, we actually had many (sales) inquiries from neighbouring countries,” Dr Lee said. “But I asked myself, ‘Do we want to be merely a middleman or do we want to build our own capability?’”

“It’s not a 100 per cent sure-win, but it’s something we must bet on.”

Dr Lee revealed that the bus chassis will be from a supplier which has agreed to allow ST Kinetics access to the vehicle’s electronic and communications network.

The driverless bus will have an all-aluminium body to keep it light and it will be electrically powered.

Besides lithium-ion batteries, Dr Lee said the team is also looking at another newer form of batteries.

The buses will have Level 4 autonomy initially. Level 4 is when a vehicle can drive by itself but is still manned, whereas Level 5 is the highest level of autonomy when the vehicle can operate on its own with no one on board.

A number of other countries have started autonomous bus trials, but none with full-sized buses. They include Japan, the United States and Switzerland.

Last September, a driverless minibus in the Swiss city of Sion hit the opened tailgate of a parked van.

No one was hurt, but the incident again highlighted the shortcomings of autonomous technology in recognising unusual circumstances.

Dr Lee said the route on which the autonomous buses ply will be “scanned and mapped regularly” to ensure changes such as roadworks and diversions are accounted for.

The buses will also be engineered to navigate in rainfall of up to 30mm per hour, which means they might not be able to operate in a torrential storm.

NUS transport researcher Lee Der-Hong said that autonomous buses would be most suitable for “trunk services with minimum turning requirements and with bus lanes to enable better right of way”.

“Since it is to be an electric bus, the route should ideally not be distant from depots for charging purposes,” he added.

christan@sph.com.sg

## ST Kinetics' autonomous bus prototype

### Connectivity

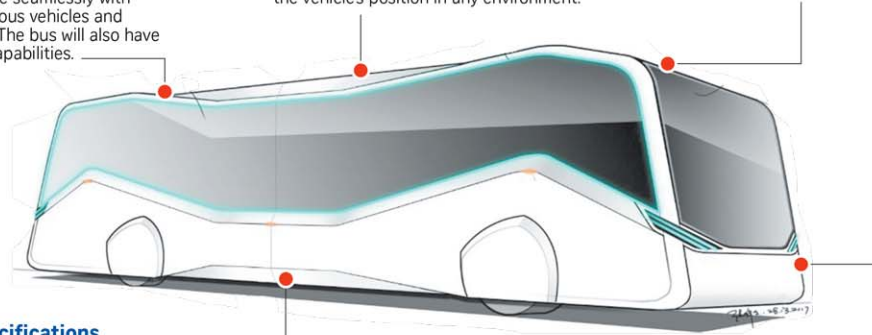
The autonomous bus will be equipped with vehicle-to-vehicle and vehicle-to-infrastructure connectivity to communicate seamlessly with other autonomous vehicles and infrastructure. The bus will also have Wi-Fi and 4G capabilities.

### Precise positioning

The bus will use a Global Positioning System. It will also be fitted with sensors to scan the surroundings and determine the vehicle's position in any environment.

### Perception sensors

Perception sensors will provide 2D and 3D maps of the environment to allow the bus to avoid obstacles.



### Vehicle Specifications

<b>Size</b>	12m (length) x 2.55m (width) x 3m (height)
<b>Carrying capacity</b>	36 seated, 33 standing, 1 wheelchair (configurable)
<b>Doors</b>	Three
<b>Maximum operating speed</b>	Up to 60kmh
<b>Typical range</b>	30-50km

### Body and powertrain

The bus will have an all-aluminium body and chassis. It has electric motors powered by two choices of batteries.

### Pedestrian and vehicle detection

Radars and sonars will cover the area within 10m in front of the vehicle and scan the surroundings before the bus moves off. Long-range radars will detect vehicles that are up to 200m ahead. Cameras will detect obstacles and supplement perception maps with environmental analysis and classification (such as road signs and traffic lights).

Source: LTA STRAITS TIMES GRAPHICS