

RAC Intellibus®

On board with the tech

RAC, with the support of Western Australian State Government and the City of South Perth, are trialling a fully driverless, electric shuttle bus, in Australia's first Automated Vehicle Trial.

The levels of automation

According to industry standards, there are 6 levels of automation from Level 0 (No Automation), to Level 5 (Full Automation) where the vehicle can perform all driving functions and other than setting the destination, no driver intervention is required.

Vehicles which are Level 1 (Driver Assistance), Level 2 (Partial Automation) or Level 3 (Conditional Automation) have at least one automated vehicle feature, and require the driver to complete the critical driving tasks. In these vehicles, drivers must keep their hands on the wheel at all times.

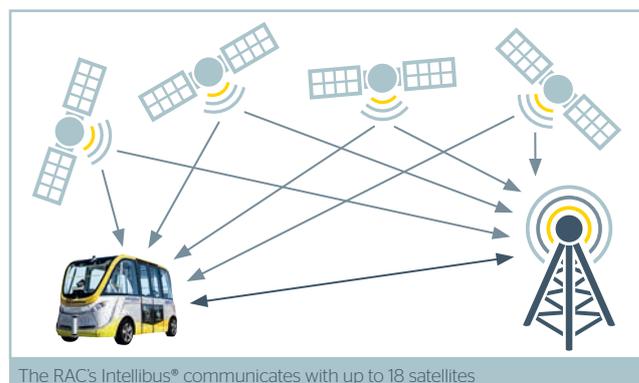
About the RAC Intellibus

What makes it an automated vehicle?

The RAC Intellibus is a Level 4 (High Automation) vehicle which means that all aspects of the driving task are automated in certain environments.

RAC's Intellibus uses a number of different sensors and telecommunications systems. It uses these sensors to localise, that is, to know where it is, and to detect obstacles so that it can react and interact within a dynamic road environment.

For localisation, RAC's Intellibus uses a combination of three main technologies. The Intellibus has two 3D Light and Detection and Ranging or LiDAR sensors. LiDARs use laser beams to create a 3D map then uses the map to track its location.



The RAC's Intellibus® communicates with up to 18 satellites

Second, an Inertial Measurement Unit or motion sensor uses odometry to know how far it has travelled and in which direction. Lastly, it has a Global Positioning System (GPS), which communicates with a number of satellites to know its exact location. Specifically, the Intellibus uses Real-Time Kinetic (RTK) GPS technology, or differential GPS to know where it is in relation to its base, or zero point. It communicates with up to 18 satellites to pinpoint its exact location to within one centimetre accuracy.

3D LIDAR

Uses pulses of light to measure distance and build a map of the environment.

Cameras

Used to 'see' traffic lights, vehicles and other objects.

2D LIDAR

Used for detecting and avoiding objects.

Global Positioning System

Uses GPS to know precise location of the vehicle geographically.

RAC Intellibus®

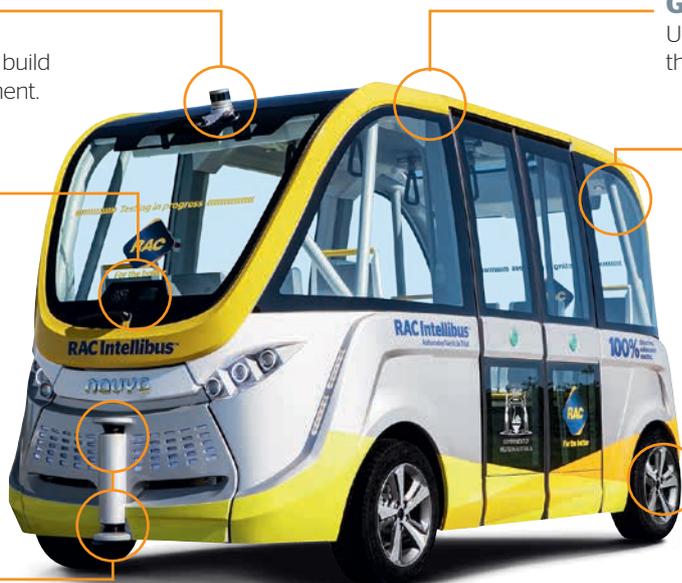
is symmetrical and can drive forward in both directions.

Odometry

Uses motion sensors to estimate its position relative to its starting location.

Autonomous emergency braking

Automatically applies the brakes if it senses objects in its path.





RAC's Intellibus also uses its 3D and 2D LiDARs as well as the stereovision cameras to detect obstacles movement and changes to the traffic environment.

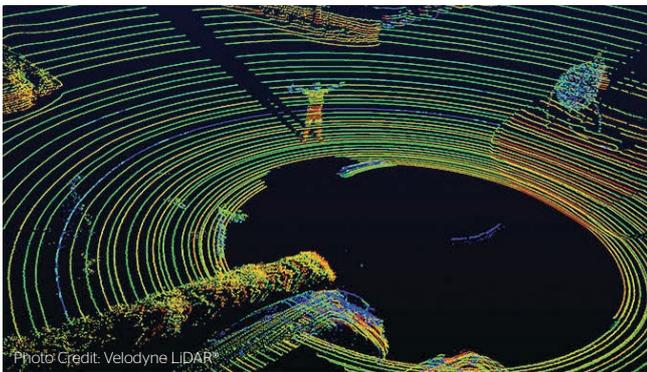


Photo Credit: Velodyne LiDAR®

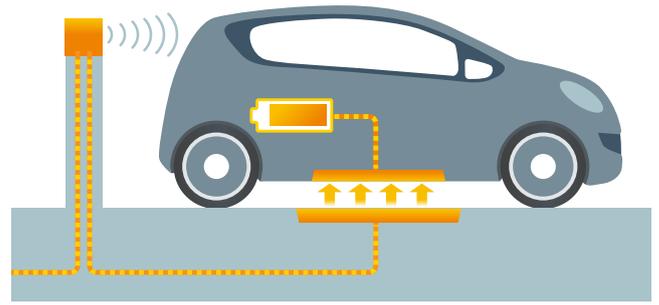
Other features

The Intellibus can carry up to 11 people and has a maximum speed of up to 45 km/h, with a lower operating speed.

The Intellibus is symmetrical, allowing it to travel forward in both directions. It also has 2 x 2 steering and a turning circle of less than 4.5 metres.

Battery specifications

RAC's Intellibus is fully electric and has an 80 volt lithium iron phosphate (LiFePO4) battery. The battery capacity is 216Ah and takes about 3 to 5 hours to charge using a 32 amp charger. On a full battery, the shuttle can run anywhere between 6 to 8 hours.



The Intellibus can be charged either by plugging a charger directly into the vehicle, or by using a wireless induction charger, which can charge by simply parking over the charging pad.

How do I take part in the Trial?

RAC's Intellibus® operates 5 days per week and takes trial participants along a 3.5 kilometre route in South Perth. Any one over the age of 7 years can take part by registering at www.rac.com.au or at the RAC Intellibus Hub®, located at the furthest eastern end of South Perth Esplanade.

"It's the way of the future - will reduce accidents, injuries and deaths on the road. Clean electric vehicles are better than petrol and I hate driving so a fantastic future is in store for me!"
 Trial Participant

About RAC

RAC works collaboratively with Government and other organisations to ensure our members and the community can move around our State safely, easily and in a more sustainable way.

We give back by reinvesting our profits for the benefit of our members through projects aligned to RAC's Mobility Agenda, such as the Automated Vehicle Trial.

Supported by:



For further information about the RAC Automated Vehicle Trial, please contact Intellibus@rac.com.au

