Transurban

Connected and automated vehicles Victorian trials

We own and operate roads in both Australia and the US and it's up to us to make sure our roads are ready for whatever changes we can see coming, whether it's population growth, changing freight patterns or new technology.

Cars that can steer themselves, recognise speed limits and manage their speed are already driving on Australia's roads.

To prepare for the expected influx of driverless vehicles, more accurately called connected and automated vehicles (CAVs), we've been running trials on our roads.

So far, we've run trials in Victoria, New South Wales and the US.

The trials are in phases and, because CAV technology is continuously evolving, we're running our trials in consultation and partnership with vehicle manufacturers, industry and government.

Victorian trials

We've partnered with the Victorian Government, VicRoads and the Royal Automobile Club of Victoria (RACV) to run a series of CAV trials on the Monash, CityLink and Tullamarine motorways in Melbourne. The first phase trialled partially automated vehicles. The coming second and third phases will trial connected and automated vehicles with higher levels of connectivity and automation.

Phase One included four trials which increased in complexity. These trials were run between August and November 2017. Professional drivers from the state-of-the-art Australian Automotive Research Centre testing facility (AARC) drove the test vehicles, with observers from Transurban, VicRoads, and RACV.

Phase One timeline

Trial 1	Trial 2	Trial 3	Trial 4	Data analysis & validation	Implementation of recommendations
August	September	October	November	December–March	April +
2 vehicles	*2 vehicles*	*3 vehicles*	*5 vehicles*	*All vehicles*	*Report released*
Off-road (AARC) On-road in non-peak Closed Burnely Tunnel	Off-road (AARC) On-road in non-peak & evening peak (twilight, night testing)	Off-road (AARC) On-road in non-peak & morning peak (dawn, early morning testing)	Off-road (AARC) On-road in non-peak, peak (morning & evening) night testing	Post processing of data from cameras, audio recordings & observations. Analysis of findings	Commence implementation of recommendations.

Phase One – what we trialled

Phase One trialled current-model Audi, BMW, Mazda, Mercedes, Tesla and Volvo vehicles with partial-automation features such as Lane Keep Assist, Adaptive Cruise Control and Traffic Sign Recognition.

The trial looked at how vehicles responded to the motorway environment in varying weather, light and congestion levels.

Description of levels of automation: Phase One focused on level one and two automation

Human

Machine

Level 0

No automation
Driver-assist features issue safety warnings, but has no vehicle control.

HANDS **ON** | EYES **ON**

Level 1

Driver assistance
Driver-assist features control speed or steering only.

HANDS **ON** | EYES **ON**

Level 2

Partial automation
Integrated driver-assist system controls speed and steering.

HANDS **TEMP OFF*** | EYES **TEMP OFF***

Level 3

Conditional automation
Automated system handles regular driving and alerts driver if intervention is required.

HANDS **OFF** | EYES **OFF**

Level 4

High automation
Automated system handles regular driving, no driver intervention is required.

HANDS **OFF** | MIND **OFF**

Level 5

Full automation
Fully autonomous system handles all situations automatically.

HANDS **OFF** | DRIVER **OFF**

* Technically possible although legality depends on jurisdictional requirements.

Partial automation features explained*

Lane Keep Assist

Reads lane lines and proactively intervenes with vehicle steering to ensure the vehicle stays in its lane.

Adaptive Cruise Control

Building on standard cruise control functions, Adaptive Cruise Control maintains a set speed and follows the car in front at a set distance.

Traffic Sign Recognition

Camera technology detects and reads speed signs and displays them in the vehicle.

Minimal Risk Condition

This refers to the way the vehicle reacts if, after multiple warnings, the driver does not take back control of the vehicle.

*** Implementations of these features vary across vehicles, for example in the range of speeds at which they function. Some of the trial vehicles allowed these features to be used in combination.**