ADELAIDE
SOUTH AUSTRALIA

Government of South Australia
Department of Planning,
Transport and Infrastructure

South Australia's Future Mobility Lab

Innovation in Transport

Forward

Future Mobility – Innovation in Transport

Innovation in transport mobility will deliver economic growth, make our roads safer, reduce greenhouse gas emissions, and transform how people and goods move across South Australia. Our roads are already some of the safest in the world and increasing advanced driver assist, connected and autonomous technologies have the potential to help cut the number of accidents further.

The benefits from autonomous road vehicles alone will contribute to decreasing future social costs of traffic congestion in Australian cities, estimated to be around $53.3 billion per annum by 2031. The annual economic loss due to road crashes in Australia is estimated by the Department of Infrastructure and Regional Development to be $27 billion per annum, with 93% of crashes being due to human error. As a result, self-driving vehicles will provide significant economic, environmental and social benefits.

The South Australian Government has taken a strong leadership approach to position the state at the forefront of technology and innovation in connected autonomous vehicle technologies. Achievements include:

- Leading the nation in 2015, when it hosted the first on-road demonstration of a driverless vehicle in Australia.
- The first Australian state to enact legislation to conduct autonomous vehicles trials.
- Established the ADVI Centre of Excellence in Adelaide.
- $10 million Future Mobility Lab Fund to support projects that demonstrate, develop, or contribute to the applied research and implementation of future mobility technologies.
- Largest cluster of driverless vehicle trials in Australia.
- French companies Navya and EasyMile, UK company RDM Group (Aurrigo) and US company Local Motors are trialling their AV shuttle bus platforms in South Australian
- Telstra and Cohda are trialling V2X over LTE for various use cases.
- SAGE Automation has integrated a number of technologies to develop a smart bus stop that can be connected with driverless shuttles.
- Established trial areas for Cohda Wireless to test and research its V2X technologies using its CAV self-driving development vehicles.
- UK-based shuttle manufacturing company RDM Group, has opened its Asia Pacific headquarters and Australian subsidiary Aurrigo in the Tonsley Innovation Precinct.
- French company EasyMile, with local company Transit Australia Group (TAG) has established its Australian headquarters and operations centre in Adelaide to deliver AVs to the Australian and Asia Pacific markets.

Our autonomous mobility ecosystem is providing the opportunity to create new jobs to support this growing base and to attract new industry players

At a national level the South Australian government is contributing to the national policy agenda and is working to support a regulatory environment that encourages safety and fosters innovation.

Future Mobility – Innovation in Transport

South Australia is an ideal place to develop and implement transformative innovations such as autonomous vehicles (AV) and associated smart transports technologies.

We are eager to unlock and attract industry investment to South Australia and further promote our reputation as one of the most welcoming environments for testing and developing connected and autonomous vehicle technologies.

Cisco has made Adelaide its first Lighthouse City in the Southern Hemisphere with the Smart City Studio helping to identify and generate projects such as Smart Lighting, Smart Environment Monitoring and Smart Parking.

Adelaide is the first capital city in Australia to construct a transformational Gig City Network providing up to 10 gigabits to businesses in Adelaide's innovation precincts.

The focus on smart city technology, carbon neutral and renewable energy is driving the attraction of shuttle manufacturers to South Australia.

South Australia's 'mobility ecosystem' continues to thrive with technologies for robotisation and automation; simulation, virtual reality and 3D mapping software; new energy storage technology; data analytics, cyber security, artificial intelligence and machine learning; communications systems and advanced sensor devices.

As customers have greater choice of transport and ever-increasing access to information, our focus will be on the next generation of integrated intelligent transport systems, the sharing economy and mobility as a service.

On-demand transportation services are already disrupting the market as are trials of autonomous shuttles, which are focussed on replacing traditional first and last mile transport. Last mile autonomous transport has the potential to replace vehicle ownership models, the need for car parking and other infrastructure.

It is predicted by 2020 many known automobile manufacturers and new entrants will have vehicles with high levels of automation commercially available. With this, comes new opportunities. Not only in terms of the development of connected and automated vehicles, but also in terms of building an integrated ecosystem to support autonomous vehicles and intelligent transport systems and in connection with this, Smart Cities.

South Australia enjoys a unique opportunity at this time as a new technological age beckons and as a player in the global intelligent mobility market.

Future Mobility Lab Fund

South Australia continues to be a significant centre for autonomous vehicle technology and is leading a number of high profile pilots and initiatives which have state and national implications.

In 2016, the South Australian Government established a $10 million Future Mobility Lab Fund over three years, to provide funding support to projects that drive the development and deployment of connected and autonomous vehicle technologies.

The Future Mobility Lab Fund has received a very strong response. This shows the level of interest in this area and the potential it has to improve the way we move around our cities and build new industries.

Projects that have received funding will contribute to the states transport mobility ecosystem by providing valuable information on first mile and last mile on-demand transport for cities, regions and freight solutions, increase capability in identification and prediction of traffic and consumer patterns, build on connected autonomous vehicle positioning and sensor product expertise and increase innovation in vehicle safety testing and solutions for interaction with CAVs on our roads.

Connected autonomous vehicle and intelligent transport system technologies are already shaping the future transport industry through the application of these technologies. This includes the development of mobility as a service (Maas), ride sharing and optimisation of integrated transport solutions.

South Australia is establishing itself as a test bed for innovation in transport. This test bed environment provides a place to trial new technologies as well as an ideal location in which to deploy commercial opportunities on our roads. South Australia is building a reputation as a first mover in the evolving intelligent transport marketplace.

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Future Mobility Lab Projects

Cohda Connected Autonomous Vehicle Trials

Cohda Wireless, a global leader in autonomous V2X technology, will receive two grants totalling up to $2 million from the Future Mobility Lab Fund to conduct on-road trial projects on the streets of Adelaide to test how vehicles communicate to one another and with roadside infrastructure, as well as expanding the Cohda's work in 'Vehicle to Everything' communications (V2X).

The grant was used to acquire two autonomous vehicles capable of driverless operation in urban and highway environments to test the company's CAV applications. Cohda will also deploy a network of its V2I road side units on the streets of Adelaide's CBD enabling a test environment for the CAV self-driving development vehicles.

Cohda Wireless is a global leader in the development of Connected Autonomous Vehicle software with proven applications for Smart City, Mining and other environments. Cohda's technology connects vehicles with infrastructure and pedestrians to make our streets, cities and working environments safer, smarter and greener. Cohda is headquartered in South Australia and has offices in Europe, China and the USA.

Cohda Wireless's innovative software solutions enable autonomous vehicles to connect with other vehicles and with Smart City infrastructure. These connections span Vehicle-to-Vehicle, Vehicle-to-Infrastructure, and Vehicle-to-Pedestrian (collectively called V2X), and allow CAVs to 'talk' to each other, Smart Cities, and vulnerable road users in order to avoid accidents, reduce congestion and be more efficient.

Cohda partners with Tier 1 Automotive Suppliers, ITS Equipment Vendors, and Mining Equipment Technology and Services (METS) vendors to provide complete hardware/software solutions to Car Makers, Smart Cities, and Mine Operators, respectively. Cohda's products are used widely in locations including the USA, Europe, Australia, Japan, Africa, Middle East, China, Singapore, Taiwan, and Korea.

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Future Mobility Lab Projects

Flinders Autonomous Shuttle Trial

Flinders University will receive up to $1 million of Future Mobility Lab Funds for a five-year, three stage, $4 million driverless last mile shuttle project - for which Flinders University and the RAA have partnered with industry supporters Cohda Wireless, Renewal SA, SAGE Automation, SIEMENS, Telstra, UPG, ZENEnergy and public transport operator Keolis Downer.

Navya's ARMA electric shuttle, which can carry up to 15 passengers, will propel the Flinders Autonomous Shuttle Trial (FLEX) around the 61 hectare Tonsley Innovation Precinct.

The Tonsley stage of the trial has now started and will see the shuttle used on public roads between the nearby Clovelly Park Train Station and Tonsley's Main Assembly Building (MAB), then connections to bus stops on South Road and businesses within the Tonsley Innovation District. Future stages will to extend to the Bedford Park campus and other local public transport hubs.

The vehicle will be docked within a six-bay solar re-charging garage, constructed near the Mitsubishi building on South Road, which will also be available to the public to recharge their electric vehicles for free, as part of an awareness campaign to promote carbon neutral transport options.

Flinders University will also utilise the trial to research the public's acceptance and response to driverless vehicles.

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Future Mobility Lab Projects

EasyMile – Playford Connect Trial

French autonomous vehicle manufacturing company EasyMile has partnered with the City of Playford and Transit Australia Group (TAG) to conduct a first/last mile driverless shuttle trial in Elizabeth named Playford Connect. The trial will utilise the EasyMile EZ10 autonomous electric shuttle that can carry up to 12 passengers. TAG will establish an operational control centre and provide maintenance services to support the trial and EasyMile's operations in Australia and the Asia Pacific region.

EasyMile will receive up to $350,000 from the Future Mobility Lab Fund to conduct an AV trial over two phases. Phase I of the trial will involve transporting passengers on a proposed route linking Lyell McEwin Hospital to the carpark and bus stops taking a route along Oldham Road, Elizabeth Vale. Phase II of the trial involves providing a first/last mile shuttle service around the perimeter of the Elizabeth shopping link to existing bus and rail transit services. The shuttle will operate in a complex mixed traffic environment with integration to traffic lights and road sensors.

EasyMile EZ10 autonomous electric driverless shuttle includes embedded and localisation technologies to safely respond to the mixed traffic environment. The EZ10 comes equipped with an electric retractable access ramp enabling greater patron accessibility. EasyMile has conducted a number of trials and now operates in various locations around the world, including Singapore, Japan, China, Taiwan, San Jose, and Toulouse France. EasyMile has several public trials slated for Australia and New Zealand in 2018.

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Future Mobility Lab Projects

Aurrigo Driverless Cargo Pod Trial

Aurrigo, the Australian branch of UK driverless shuttle supplier RDM Group will receive up to $1 million from the Future Mobility Lab fund to trial a driverless cargo pod, transporting goods and people at the Tonsley precinct, with the aim of developing a market-ready autonomous delivery pod within a year.

RDM is a manufacturer of autonomous vehicles and has supplied vehicles to a £20 million UK Autodrive project to conduct trials near London. RDM through its subsidiary, Aurrigo plans to assemble driverless pods in Adelaide for the Asia Pacific region as well as provide local access to RDM's expertise in AV supply and fleet operations.

Aurrigo will utilise 3 RDM's "Pod Zero", a four-person autonomous shuttles for the trial. Pod Zero is designed for short passenger or freight journeys, such as within industrial sites, residential communities or airports, its typical speed is 8 km/hour but it can reach 24km/hour.

The Pod Zero's Autonomous Control System (ACS) detects and avoids obstacles such as pedestrians, cyclists and stationary objects using sensors and on-board processing. The pod can be booked through Bluetooth, using a mobile phone app, and its powered by a battery pack that can be replaced in 10 minutes and recharged in less than three hours.

The trial will enable businesses at Tonsley to test AVs as part of their local network or within their facilities and assist Aurrigo to develop other use cases for its Pods in South Australia, interstate and the region.

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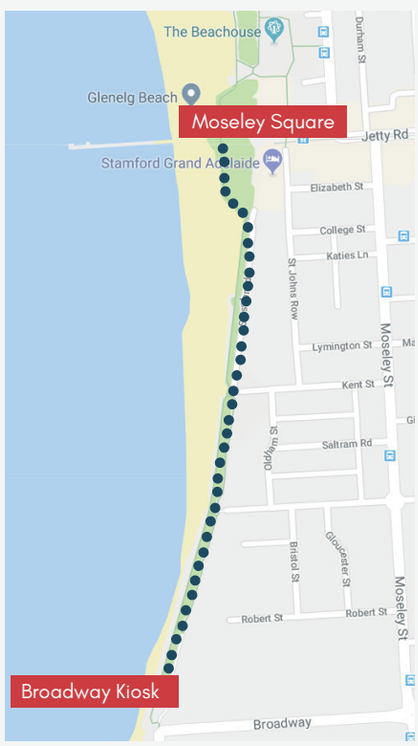
Future Mobility Lab Projects

Local Motors Olli Shuttle and SAGE smart bus stop trial at Glenelg

Local Motors, an American vehicle manufacturing company has partnered with local company SAGE Automation to conduct a last mile driverless shuttle and interactive transportable bus stop trial at Holdfast Bay. The trial will utilise the Local Motors Olli Shuttle which will be integrated with the SAGE designed and manufactured smart bus stop providing a first of its kind connected autonomous bus and bus stop platform.

Local Motors will receive up to $500,000 and SAGE Automation will receive up to $200,000 from the government's Future Mobility Lab Fund to conduct the last mile shuttle and bus stop trial.

Local Motors driverless shuttle, Olli, will transport passengers on a proposed route from Mosely Square Glenelg, close to the Tram Terminus and run along the shared bike path route to the Broadway Kiosk. The SAGE smart bus stop's will be located at Mosely Square and near the Broadway Kiosk. The Smart bus stop which will be solar powered, includes the latest IBM Watson interface with interactive displays and audio system, allowing for a personalised user experience. The Olli shuttle and Smart bus stop will serve tourists and the local community providing them with the opportunity to experience autonomous vehicle technologies.



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Future Mobility Lab Projects

SAGE Automation

SAGE Automation has received two grants to extend the capability of Addinsight, the traffic intelligence system developed by South Australian Department of Planning, Transport and Infrastructure. As preferred partner, SAGE engineers, manufactures and integrates connective data solutions for Addinsight. It has already developed numerous product variations that help road authorities implement and harness the Addinsight System to its fullest capability.

In the first grant SAGE has tested new technology that enables individual passenger detection rather than just vehicle detection, which will allow the system to be used in passenger only environments such as public transport stops.

SAGE Automation and the Future Mobility Lab has successfully integrated the first ever full-colour trailer mount variable message sign (VMS) with Addinsight travel information and satellite tracking. In partnership with local entities Addinsight, SAGE Automation, Myriota and Graphic Sign Hire they were able to provide Addinsight travel time map with low power satellite communications on an energy efficient full-colour VMS.

As Australia's leading integrator of intelligent transport systems SAGE helps improve end-user experience, reduce life cycle costs, lessen environmental impact and prepare transport systems for future technologies. SAGE is supporting multiple autonomous vehicle trials and manufacturers, and will soon announce a major partnership in this area.

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Future Mobility Lab Projects

University of Adelaide – CASR - AV Safety Testing

The University of Adelaide's Centre for Automotive Safety Research (CASR), will receive up to $670,000 from the Future Mobility Lab Fund to build capabilities and a crash lab for testing of autonomous vehicle technologies for ANCAP and EuroCAP safety protocols.

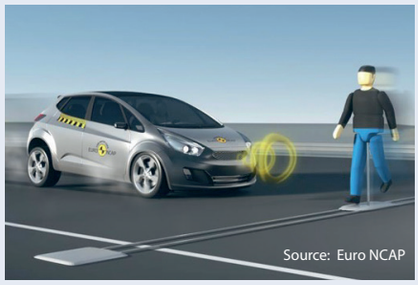
The funds will enable the University of Adelaide to purchase specialised equipment that will enable CASR to test the capabilities of autonomous technologies such as Autonomous Emergency Braking (AEB), collision avoidance technologies and lane support systems and ensure that they are operating safely and as expected in all conditions on Australian roads.

This testing will be vital to ensure that vehicles operate effectively in Australia's unique traffic conditions and safety criteria.

Once in place, CASR will be the leading Australasian New Car Assessment Program (ANCAP) testing facility in the region for CAV technologies.

The ANCAP testing will be recognised across Europe and will promote South Australia to vehicle and technology manufacturers as a primary location for CAV development in Australasia.

By having this capability locally, it will provide South Australia as a leader in vehicle safety and innovation, particularly within the rapidly emerging area of CAV technologies and will contribute to the leadership position South Australia has taken in CAV technologies.



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Telstra Connected Transport Solutions – Connecting Vehicles to Everything

Telstra and Cohda Wireless have successfully tested Vehicle-to-Pedestrian (V2P) technology over the 4G mobile network in Adelaide, showcasing an Australian-first by sending standardised intelligent transport systems messages over the 4G network to enable interaction of vehicles with smartphone-equipped bicycles & pedestrians.

The trial demonstrated vehicles interacting directly with pedestrians' and cyclists' mobile phones to improve safety on the road network. The technology was tested using common scenarios, such as a car and a cyclist approaching a blind corner, a car reversing out of a driveway, and a car approaching a pedestrian. The tests have shown that safety between vehicles and vulnerable road users can be improved simply by broadcasting safety signals from smartphone technology leveraging the current 4G cellular network.

Telstra and Cohda will also be demonstrating cellular – Vehicle – to- Infrastructure (V2I) technology in the near future, a pivotal first step in developing Vehicle-to-everything (V2X) technology. Applications for the technology will be utilising integration into the SCATS traffic control network. (Traffic Lights) demonstrating green light priority to high priority vehicles, testing optimal green light timing where the vehicle is informed of the optimal speed to approach a traffic light so that that they get a green light when they arrive, therefore allowing a more continuous flow of traffic.

The use and development of V2X communications will enable the creation of intelligent transport systems that may allow more efficient use of road infrastructure, better traffic management (reduced congestion) and, in the future, coordinated and safe autonomous vehicle operation.

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