RAA Member Panel

Autonomous vehicles - perceptions and attitudes

Background

In response to continuous developments in autonomous technologies and increasing trials of autonomous vehicles in South Australia and worldwide, RAA surveyed the Member Panel to gather their perceptions and attitudes about these vehicles. More than 1,100 responses were received in the survey conducted in August 2018. The following sections present the main findings.

Fully autonomously vehicles (AVs) are vehicles that do not need any human intervention to operate, so basically, they can drive themselves. They can detect their surroundings using sensors and process this information to identify appropriate navigation paths and avoid obstacles. Throughout the survey we referred to fully autonomous vehicles as autonomous vehicles.

Overview

In the current survey Members have expressed a strong awareness about autonomous vehicles. At the same time, they showed concerns regarding their safety using or sharing the roads with AVs.

A number of benefits were recognised for AVs, specially to enhance freedom and independence for the young, aging and those with mobility difficulties. However, concerns received significant attention on issues such as the reliability of the technology, who will be responsible in case of a crash and sharing the road with other users.

Analysis of verbatim comments provided further insights into Members' opinions on the matter, with trust in technology being highly regarded.

Awareness and Knowledge

Over the survey respondents expressed high awareness and understanding of what autonomous vehicles are. While 94% of respondents have heard about them in the past and 91% know what an autonomous vehicle is, only 9 per cent have ever been in an autonomous vehicle.

Among the autonomous vehicle features currently available in vehicles, most member panellists have heard of or driven a vehicle with some autonomous technologies such as collision avoidance system where a car can detect and avoid collisions with other vehicles and road users (96% of respondents), automatic braking if an imminent collision is detected (95%), and a vehicle that can park itself (94%).

The least known feature, with less than half respondents mentioning it (48%), was the technology that allow vehicles to change lanes by itself.

Attitudes towards autonomous vehicles

Safety issues and autonomous vehicles. Similarly to the RAA survey conducted four years ago on autonomous vehicles, a significant number of respondents are concerned about their safety with autonomous vehicles driving on the roads. While almost half the respondents (49%) would feel unsafe as a passenger in a vehicle that drives itself, about the same number (51%) would feel unsafe as a driver sharing the roads with AVs. This compares to 49% and 45% of respondents respectively of

the previous survey. Only 2 out of 10 respondents would feel safe either as a passenger of a driverless vehicle or as a driver of a car sharing the roads with AVs.

Use of autonomous vehicles. In line with the above findings, just over half the respondents (52%) would rather not use an autonomous vehicle. Excluding those respondents who are extremely unlikely to use an AV, respondents would consider AVs to transport them at times when they are physically or mentally unable to drive manually (e.g. after a stroke, due to age-related impairments) (81% of responses). Other situations considered to use an AV include when tired or fatigued (58%), after consuming alcohol, drugs or taking medication (at a legally acceptable level) (48%) and in situations in which they feel uncomfortable driving (e.g. in bad weather or at night) (41% of respondents).

On the other hand, respondents would least consider AVs to pick up children from school or bring them to after-school activities (7%).

Potential benefits. Among the potential benefits, most member panellists (60% of respondents) stated that AVs could enhance freedom and independence for the young, aging and those with mobility difficulties. Other benefits that AVs could provide include less need for public parking in towns and cities (38%), their travel time being used more effectively or productively doing other activities (38%), better fuel efficiency (36%), and reduced severity of crashes (33%).

The least benefits stated referred to the convenience of using an autonomous vehicle rather than owning your own car and AVs reducing traffic congestion, with 16 and 20 per cent of responses respectively.

Current concerns. Respondents identified their main concern as not being able to manually override the vehicle and take control if the system fails (87% raised this as a concern). This was followed by:

- who would be responsible in the case of a crash (82%),
- how driverless vehicles will interact with pedestrians and cyclists (81%),
- cyber security and threats to the system or their vehicle being hacked and overridden remotely (81%), and
- giving up control and entrusting a machine with their safety and the safety of their family (78%).

The least issue respondents are concerned about is learning how to use a driverless vehicle (26% of respondents) indicating it is not considered to be difficult to ‘operate’ such a vehicle.

Further insights

AV ownership. Most respondents want to continue to own or have exclusive use of the vehicle and would not share their AVs with other households such as family, friends or neighbours (56%) compared to 17% that would share their ownership. 27% are unsure about it.

South Australia leadership in AVs. 28% of respondents believe that South Australia should be a leader in the acceptance of autonomous vehicles compared to 36% who are negative about this. A

high 35% are unsure about it. This could mean people think we shouldn't be 'pioneers' but monitor what others do and then adapt.

Overall

Based on everything they know about AVs 29% of respondents are positive about the idea of vehicles driving autonomously, with 43% being negative and 28% neutral. Breaking these responses by age, the positive perceptions overcome the negative ones for the age range of 25 to 34 years-olds where 39% feel positive compared to 35% which are negative.

Among the barriers to overcome for AVs to operate on South Australian roads, about 6 out of 10 respondents stated there are a number of them. The main barriers indicated are:

1. Confidence in technology (33%)
2. Poor conditions of the roads (26%)
3. Possible conflict between drivers of conventional vehicles and vehicles with new technologies (23%)
4. Legal obligations-regulations (15%)
5. Other (3%)

In summary, while there is acknowledgement of the development of new autonomous technologies and their potential benefits to the community, there are concerns regarding safety and the systems that would enable autonomous vehicles to drive on public roads. At this point on time, respondents feel more negative than positive about autonomous vehicles with a high proportion of people who are unsure.

Verbatim analysis

The survey provided respondents the opportunity to express comments of interest they could have. Over 450 responses were received raising topics of interest which assist to further understand Members' insights.

While comments included a broad number of issues, topics that were most often mentioned include:

Confidence in technology. Confidence in technology was a highly mentioned topic. Issues that were included within this topic are the current development of technology, cyber-attacks and security, and the need of having more testings. A number of comments pointed at what would happen when devices in vehicles fail.

Concerns in this matter also included doubts regarding the reliability of AVs to understand the environment and react accordingly making safe decisions. The concerns included the identification and interaction with other road users and animals doing quick unexpected movements or manoeuvres.

> *There is not a single realm of human endeavour currently run by a computer, that doesn't open up HUGE concerns about hackability, reliability, the one-in-a-million tech collapse, and shutdown or lock-in of failsafes (e.g. catastrophic human/autopilot interfaces on aircraft). This move to the "next new thing" is idiotically premature.*

We have discussions at home wondering if a crash is inevitable, will the car choose to crash into a group of school children or veer away and go over the cliff? Do we find out before we buy what the answers to such questions are?

Theoretically once all vehicles are autonomous it may be safer, as every car knows where others are. But while there are a mix of driven cars, pedestrians, cyclists etc, it is an accident waiting to happen.

Very concerned as a motorcycle rider about reports from overseas of autonomous vehicles not "seeing" motorcycles, cyclists & pedestrians.

Infrastructure requirements and regulation. The current state of South Australian infrastructure was of concern for a number of respondents. Among things included under this topic were the condition and extension of south Australian roads, the ability to drive on loose roads, and the quality of signalisation on the road. A number of respondents pointed out at the different metro and country environments highlighting that AVs could work in some contexts but not in others.

In parallel the requirement of adequate regulation and legal accountability were mentioned as part of the concerns.

Would there be separate lanes for these vehicles? Surely conventional vehicles would not be compatible with these? A lot of different infrastructure would be put in place before - one would think.

What happens when detours or other roadworks are occurring on the planned route? How do these cars keep in their lane in instances where new lines have been made & it is possible to see the old markings, especially in wet weather? Why would there be no manual override in case of computer failure?

Living in a rural location I do not see autonomous vehicles as an option due to the sparsity of network infrastructure needed to operate their sensors and systems. Enough trouble over here (Eyre Peninsula) with adaptive cruise control and collision avoidance becoming confused or being over-sensitive to wind/road debris/roadside vegetation and wildlife like birds and roos.

How would they work on country roads, single lane and no markings?

[…] I'm also a bit concerned that there is no infrastructure in place, making them more of a hybrid autonomous/driver required type of thing.

[…] What concerns me most is the insurance/ legal obligations and/or consequences of these vehicles.

Autonomous vehicles are coming. It makes sense for society to accept this, and put in place the legal and social framework to accept this fact.

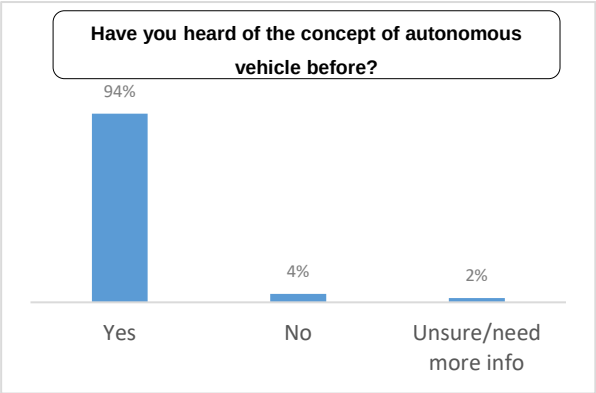
More information needed. A number of Members referred to the importance of having more information on the matter.

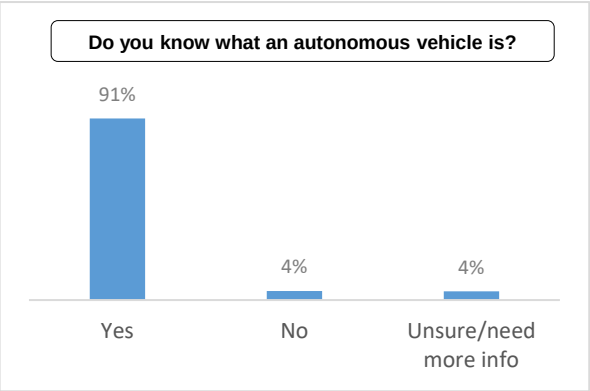
There are many variables and information gaps to be addressed before confidence in autonomous vehicles can rise, however I think they will form an important role in meeting future transport needs.

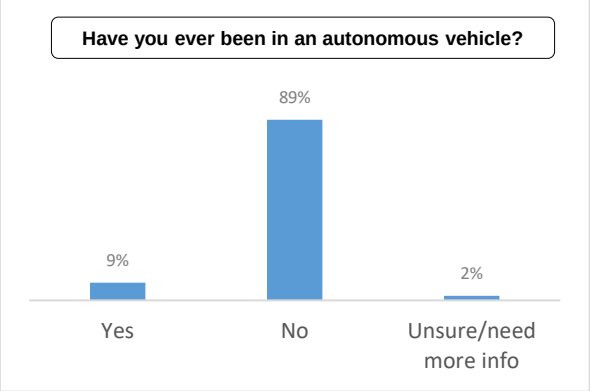
Hard to make decisions when so much is unknown. Main concerns are cost and safety.

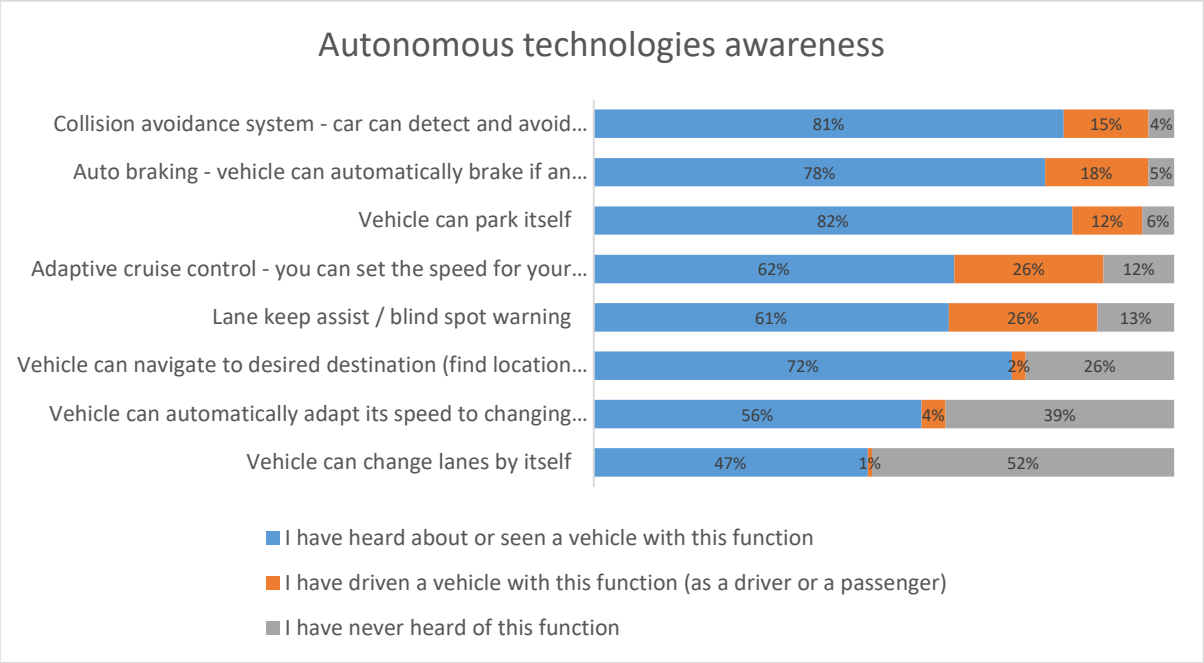
Need to see a lot more trials etc. and have more information.

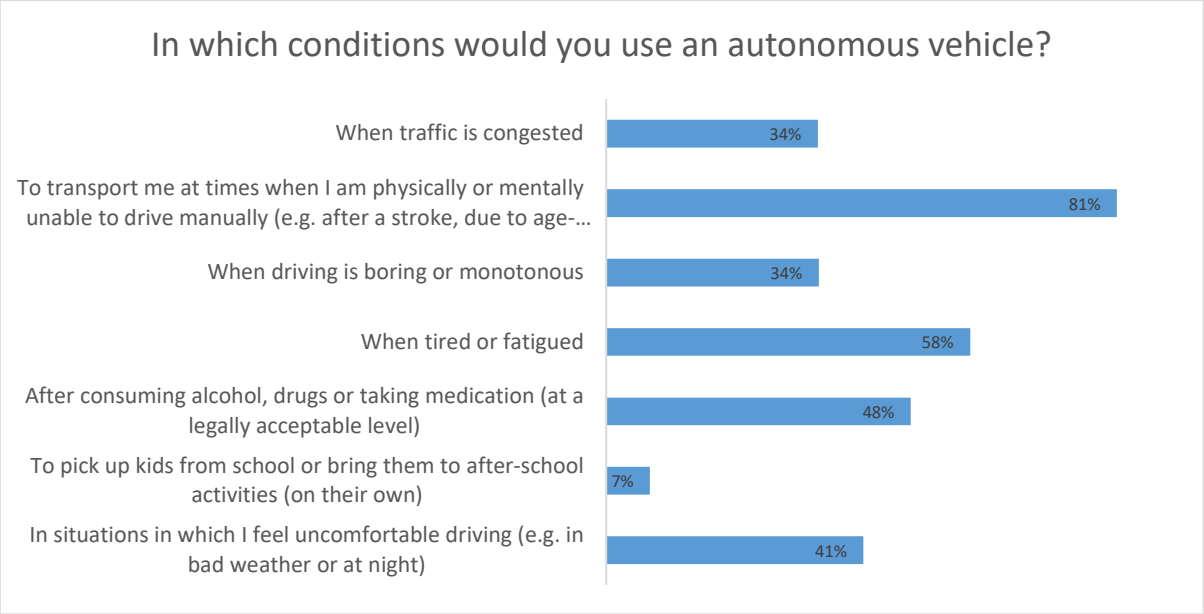
Appendix A – Selected charts

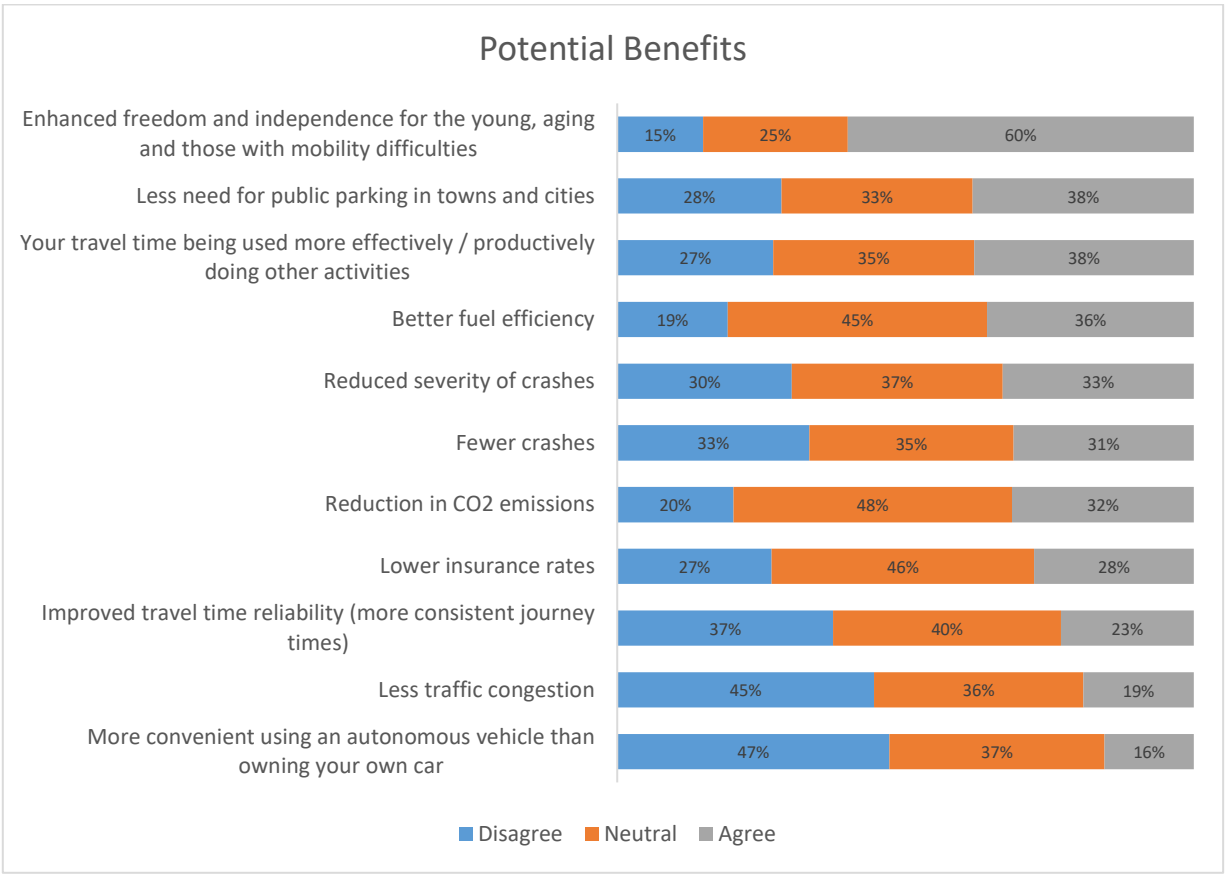


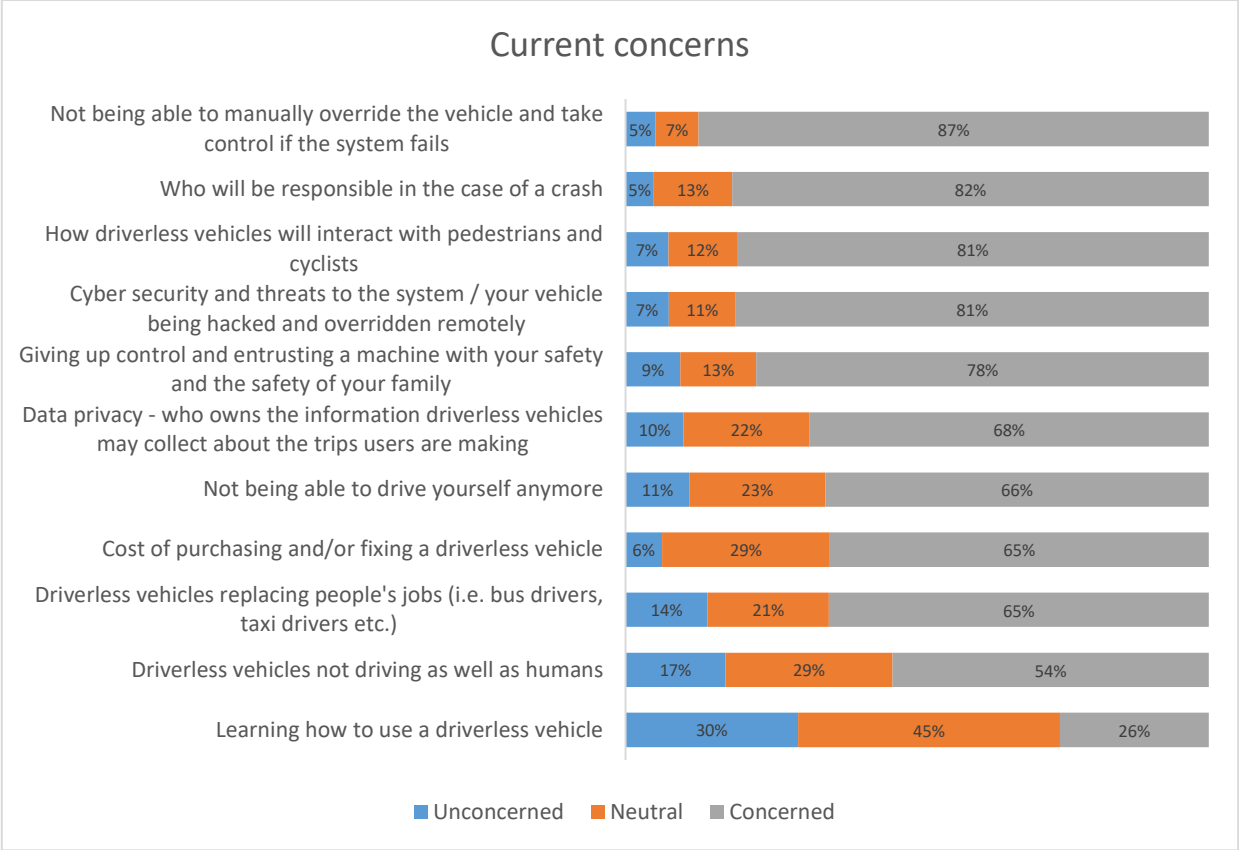


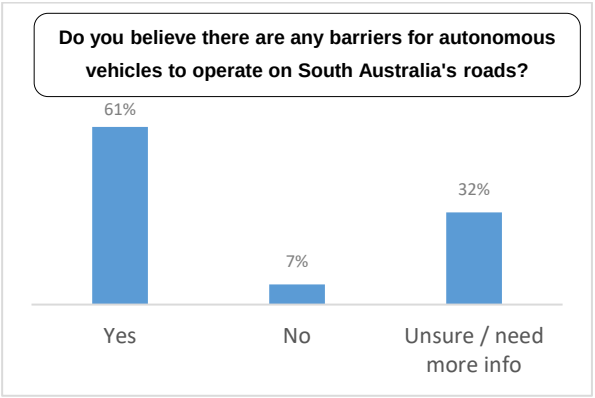


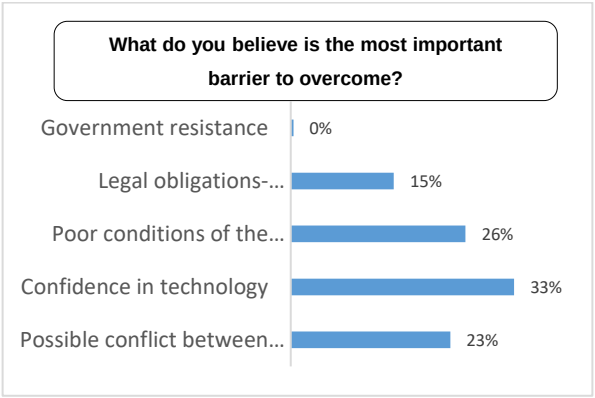


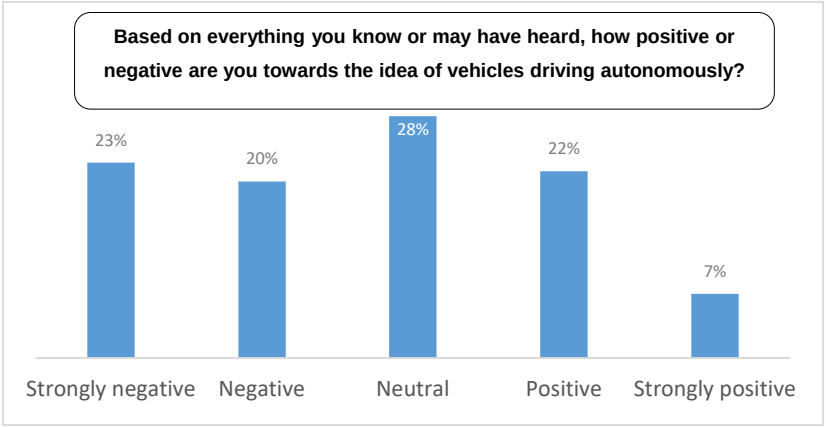

In which conditions would you use an autonomous vehicle?
When traffic is congested
34%
To transport me at times when I am physically or mentally unable to drive manually (e.g. after a stroke, due to age-...
81%
When driving is boring or monotonous
34%
When tired or fatigued
58%
After consuming alcohol, drugs or taking medication (at a legally acceptable level)
48%
To pick up kids from school or bring them to after-school activities (on their own)
7%
In situations in which I feel uncomfortable driving (e.g. in bad weather or at night)
41%


Potential Benefits
Enhanced freedom and independence for the young, aging and those with mobility difficulties
15%
25%
60%
Less need for public parking in towns and cities
28%
33%
38%
Your travel time being used more effectively / productively doing other activities
27%
35%
38%
Better fuel efficiency
19%
45%
36%
Reduced severity of crashes
30%
37%
33%
Fewer crashes
33%
35%
31%
Reduction in CO2 emissions
20%
48%
32%
Lower insurance rates
27%
46%
28%
Improved travel time reliability (more consistent journey times)
37%
40%
23%
Less traffic congestion
45%
36%
19%
More convenient using an autonomous vehicle than owning your own car
47%
37%
16%
Disagree
Neutral
Agree


Current concerns
Not being able to manually override the vehicle and take control if the system fails
5%
7%
87%
Who will be responsible in the case of a crash
5%
13%
82%
How driverless vehicles will interact with pedestrians and cyclists
7%
12%
81%
Cyber security and threats to the system / your vehicle being hacked and overridden remotely
7%
11%
81%
Giving up control and entrusting a machine with your safety and the safety of your family
9%
13%
78%
Data privacy - who owns the information driverless vehicles may collect about the trips users are making
10%
22%
68%
Not being able to drive yourself anymore
11%
23%
66%
Cost of purchasing and/or fixing a driverless vehicle
6%
29%
65%
Driverless vehicles replacing people's jobs (i.e. bus drivers, taxi drivers etc.)
14%
21%
65%
Driverless vehicles not driving as well as humans
17%
29%
54%
Learning how to use a driverless vehicle
30%
45%
26%
Unconcerned
Neutral
Concerned


Do you believe there are any barriers for autonomous vehicles to operate on South Australia's roads?
61%
7%
32%
Yes
No
Unsure / need more info


What do you believe is the most important barrier to overcome?
Government resistance
0%
Legal obligations-...
15%
Poor conditions of the...
26%
Confidence in technology
33%
Possible conflict between...
23%


Based on everything you know or may have heard, how positive or negative are you towards the idea of vehicles driving autonomously?
23%
20%
28%
22%
7%
Strongly negative
Negative
Neutral
Positive
Strongly positive