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# Feedback on the National Road Transport Technology Strategy and the 2024–27 National Connected and Automated Vehicle (CAV) Action Plan

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## 1. Introduction

### 1.1 About Blind Citizens Australia

Blind Citizens Australia (BCA) is the peak national representative organisation of and for the over 500,000 people in Australia who are blind or vision impaired. For nearly 50 years, BCA has built a strong reputation for empowering Australians who are blind or vision impaired to lead full and active lives and to make meaningful contributions to our communities.

BCA provides peer support and individual advocacy to people who are blind or vision impaired across Australia. Through our campaign work, we address systemic barriers by promoting the full and equal participation in society of people who are blind or vision impaired. Through our policy work, we provide advice to community and governments on issues of importance to people who are blind or vision impaired. As a disability-led organisation, our work is directly informed by lived experience. All directors are full members of BCA and the majority of our volunteers and staff are blind or vision impaired. They are of diverse backgrounds and identities.

### 1.2 About people who are blind or vision impaired

There are currently more than 500,000 people who are blind or vision impaired in Australia with estimates that this will rise to 564,000 by 2030. According to Vision Initiative, around 80 per cent of vision loss in Australia is caused by conditions that become more common as people age.[[1]](#endnote-1)

Australians who are blind or vision impaired can live rich and active lives and make meaningful contributions to their communities: working, volunteering, raising families and engaging in sports and other recreational activities. The extent to which people can actively and independently participate in community life does, however, rely on facilities, services and systems that are available to the public being designed in a way that makes them inclusive of the needs of all citizens – including those who are blind or vision impaired.

## 2. Submission Context

BCA welcomes the opportunity to provide feedback on the Commonwealth government’s draft National Road Transport Technology Strategy and draft 2024–27 National Connected and Automated Vehicle (CAV) Action Plan. These documents will help shape nationally coordinated and consistent rollouts of new road transport technologies across Australia.

BCA has already made a detailed submission to the Department of Infrastructure, Transport, Regional Development, Communications and the Arts this year regarding vehicular technologies.

That earlier submission articulated the need for the mandatory installation of an Acoustic Vehicle Altering System (AVAS), without a pause function or off-switch, on all electric, hydrogen fuel cell and hybrid vehicles registered in Australia.[[2]](#endnote-2)

This submission is based on the following legislative and policy frameworks:

* Draft National Road Transport Technology Strategy.
* Draft 2024–27 National Connected and Automated Vehicle (CAV) Action Plan.
* Disability Standards for Accessible Public Transport 2002 (Transport Standards).
* Australia’s Disability Strategy 2021–2031.
* United Nations Convention on the Rights of Persons with Disabilities (UNCRPD).

This submission welcomes the environmental, economic and social benefits offered by emerging transport technologies. At the same time, BCA reiterates our concerns about the potential exclusion and endangerment of people who are blind or vision impaired.

As a signatory to the UNCRPD, governments in Australia have an obligation to monitor and eliminate safety hazards to ensure the wellbeing of people with disability.

Australia’s Disability Strategy, through which the UNCRPD is operationalised in Australia, requires governments to ensure that ‘the built and natural environment is accessible.’

BCA’s submission is based on extensive consultations with members and other people who are blind or vision impaired, and our ongoing advocacy work in the disability sector.

## 3. Blind Citizens Australia’s Submission

### 3.1 Opportunities for safer and more inclusive transport

#### Human error and other factors in road fatalities

BCA welcomes technologies that would spare people from the immense trauma and grief associated with road traffic crashes. An estimated 60 million people perished on the roads during the 20th century, a figure comparable to the fatalities of the Second World War – the deadliest conflict in history.[[3]](#endnote-3)

According to the World Health Organization, approximately 1.3 million people continue to die on the roads each year. Vulnerable road users – including pedestrians, cyclists and motorcyclists – account for more than half of those deaths.[[4]](#endnote-4)

An additional 20 to 50 million people experience non-fatal road traffic injuries each year, often resulting in disability. For most countries, the costs associated with road traffic crashes are equivalent to three per cent of gross domestic product.[[5]](#endnote-5)

In 2016, Elon Musk, the chief executive officer of Tesla – the world’s leading electric vehicle manufacturer – said that CAVs ‘at this point, can drive autonomously with greater safety than a person.’[[6]](#endnote-6) Some road safety officials in the United States have bolstered such claims by citing a statistic that human error causes 94 per cent of road traffic crashes. That figure is misleading.[[7]](#endnote-7)

Human error often plays a key role in crashes, but so do other factors, including:

* **Poorly designed roads.** The majority of roads in regional and rural areas are unsealed. ‘Some of these unsealed roads,’ according to the Australian Rural Road Group, ‘are not even sheeted regularly; effectively they are pathways cut into in the soil, at the mercy of the elements.’[[8]](#endnote-8) It should come as no surprise that people in regional Australia were almost five times more likely to die in road crashes than people living in cities in 2022.[[9]](#endnote-9)
* **Poorly maintained roads.** A report published by the Grattan Institute in November 2023 described the condition of Australia’s local roads, especially in regional and rural areas, as ‘a dangerous disgrace.’ The public policy think tank recommended a $1 billion annual funding injection from the Commonwealth to address the problem.[[10]](#endnote-10)
* **Climate-vulnerable road infrastructure.** The quality of Australia’s roads has fallen even further as a result of devastating natural disasters. The Victorian government, for example, was left with 116,000 potholes to fill after the east coast floods in October 2022.[[11]](#endnote-11) Commonwealth, state, territory and local governments must invest in infrastructure specifically designed for changing climate conditions.
* **Consumers’ growing demand for sport utility vehicles (SUVs).** Sales of new SUVs in Australia have nearly doubled over the past decade. The large vehicles accounted for 53 per cent of new vehicle sales in Australia in 2022.[[12]](#endnote-12) SUVs are much heavier than conventional cars and often have blunt front ends, causing them to take longer to stop and strike with more force.[[13]](#endnote-13) American researchers have found that children are eight times more likely to die when struck by an SUV than by a standard car.[[14]](#endnote-14)
* **Inadequate protections for pedestrians.** Pedestrians account for approximately 13 per cent of all road fatalities in Australia.[[15]](#endnote-15) Driver inattention, vehicle speed, a lack of pedestrian facilities (such as footpaths and pedestrian access points at intersections), and inadequate street lighting are often contributing factors. The minimum lighting level for residential streets in Australia is extremely low by international standards, around seven times lower than that in the United Kingdom.[[16]](#endnote-16) International researchers have found that improved street lighting can reduce the number of collisions by around 30 per cent.[[17]](#endnote-17)

BCA has previously detailed the additional road safety challenges faced by people who are blind or vision impaired. These include the dangers that arise when electric and hybrid vehicles are not fitted with AVAS, and when footpaths lack tactile ground surface indicators (TGSIs) or are blocked by obstacles such as post boxes, telegraph poles, bus stops and outdoor dining facilities.[[18]](#endnote-18)

An influx of CAVs on Australia’s roads will not magically solve the problems mentioned above. These challenges require strategic thinking, intergovernmental cooperation and significant financial investment.

When developing the ratings framework to assess the readiness of Australian roads for CAVs, as outlined in Action 3.4 of the draft 2024–27 National Connected and Automated Vehicle (CAV) Action Plan, the Commonwealth government should consider the following recommendations.

**Recommendations:**

1. Collaborate with state, territory and local governments to improve the design and maintenance of Australia’s roads.
2. Collaborate with state, territory and local governments to invest in infrastructure specifically designed for changing climate conditions.
3. Nudge consumers away from purchasing SUVs by scaling back the tax incentives for such vehicles and working with state, territory and local governments to create more small-car only parking spots.
4. Amend Australia’s public lighting standard, AS/NZS 1158, to increase the brightness of residential streets.

Inclusive transport for people with disability

People with disability arguably have the most to gain from CAVs. A recent systematic review by American researchers found that over 40 per cent of people with disability rely on others for transportation, and over 70 per cent limit their travel.[[19]](#endnote-19)

In October 2015, Steve Mahan, who is legally blind, became the first non-Google employee to ride alone in the company’s gumdrop-shaped CAV in Austin, Texas. He reflected on the significance of this technology: ‘This is a hope of independence. These cars will change the life prospects of people such as myself.’[[20]](#endnote-20)

BCA’s submission earlier this year for the 2022 Review of the Disability Standards for Accessible Public Transport 2002 (Transport Standards) detailed the discrimination frequently experienced by people who are blind or vision impaired when using public transport. One of the most chilling statistics from that submission is that disability experts believe at best only half of the nation’s public transport infrastructure is accessible today.[[21]](#endnote-21)

CAVs could revolutionise the lives of people who are blind or vision impaired. It would allow them to travel independently and eliminate the worry of potentially falling onto the train tracks, having a bus close its doors on them or drop them at the wrong location, or being denied access to a taxi or rideshare when travelling with their dog guide.

Recognising Australia’s unique transport needs

In order for CAVs to be safe and accessible for all Australians, the Commonwealth government must ensure that the vehicles’ computer systems recognise and incorporate the needs of people with disability within the context of Australia’s road rules and customs. With Australia no longer having a domestic car manufacturing industry, this is a particularly salient consideration.

Ford and Toyota still have design studios in Australia (for the moment), providing a voice at their respective corporate headquarters for the Australian market’s unique needs and aspirations.

In 2022, the Australian Research Council provided funding for Ford and the University of New South Wales to study motion sickness in CAVs.[[22]](#endnote-22) The closure of the Ford and Toyota facilities would not only weaken Australia’s industrial base, but also make it more difficult to conduct road safety testing and simulation in Australian conditions.

**Recommendation:**

1. Ensure Australia’s unique automotive market and road safety needs are met by continuing to work with the domestic Ford and Toyota design studios.

### 3.2 Protections for people who are blind or vision impaired

#### Protections for taxi, rideshare and public transport passengers with disability

The draft National Road Transport Technology Strategy recognises that the accessibility of CAV taxi and rideshare services for people with disability will ‘depend on the design and operation of these future services, including the human-machine interface.’

As noted above, relying on foreign companies may mean that the unique needs of Australian consumers are not met. It may mean that some CAVs are simply incompatible with Australian driving conditions. Zoox, a self-driving car company owned by Amazon, could be an example of this.

Zoox robotaxis are designed without a steering wheel, pedals or other manual controls. They travel bi-directionally and have seats that face each other (picture a horse-drawn carriage without the horse).[[23]](#endnote-23) Such vehicles will need sensors to determine where passengers are seated and how they can most safely exit in Australian conditions.

Imagine that a Zoox passenger’s destination is a building on the righthand side of a busy road. In California, where Zoox robotaxis are currently being trialled, opening the door on the righthand side of the vehicle would be safe for a person who is blind or vision impaired as they would be close to the curb. Exiting to the right in Australia, however, would imperil a person who is blind or vision impaired by exposing them to traffic from both directions.

As outlined in ‘Australia’s Disability Standards for Accessible Public Transport and Connected and Automated Vehicles – Main Report’ from August 2021, people with disability have many other practical considerations that must be addressed before CAV taxi, rideshare and public transport services can safely commence operations in Australia.[[24]](#endnote-24)

The Commonwealth government must amend the Transport Standards to provide appropriate regulation of CAV taxi, rideshare and public transport services. These amendments must be co-designed with people with disability and disability representative organisations.

**Recommendation:**

1. Amend the Transport Standards to provide appropriate regulation of CAV taxi, rideshare and public transport services. These amendments must be co-designed with people with disability and disability representative organisations.

#### Protections for pedestrians with disability

There is currently a lack of disability representation in the datasets used to train and test CAVs. People with disability are treated as ‘edge cases’, meaning that they are not seen as typical people and so may require special handling in CAV program algorithms.

International researchers have found that people who are blind or vision impaired do not turn their heads as often as fully sighted pedestrians before crossing the road. This poses a problem for pedestrians who are blind or vision impaired because CAVs use head movements to predict pedestrians’ intentions to cross the road.[[25]](#endnote-25)

Another researcher travelling in a CAV realised it was unable to recognise a friend crossing the road in a wheelchair. Were it not for the researcher’s manual intervention, the vehicle would have proceeded through the intersection and collided with the individual in the wheelchair.[[26]](#endnote-26)

The Commonwealth government must ensure that people with disability are included in the datasets used to train and test CAVs. It must include such a provision in the Australian Design Rule (ADR 90/01), the mechanism that provides an initial pathway to supply CAVs to the Australian market.

**Recommendation:**

1. Include in the Australian Design Rule (ADR 90/01) a provision that vehicle manufacturers must include people with disability in the datasets used to train and test CAVs.

#### Protections for all road users

As part of the research for this submission, BCA staff viewed the videos posted to YouTube by John Bernal, formerly an advanced driver assistance systems test operator at Tesla. He lost his job for showing how the company’s Full Self-Driving (FSD) Beta system worked in different locations around Silicon Valley, California. We encourage all stakeholders in this area to do the same.

In one video, Bernal’s 2021 Tesla Model 3 experienced ‘phantom braking’, drove itself in a ‘Bus Only’ lane, repeatedly drove along the tracks of an operational light railway, stopped in the middle of an intersection, and drove up and over curbs.[[27]](#endnote-27) In another video, the FSD Beta system prompted the vehicle to run a red light on six separate occasions.[[28]](#endnote-28)

Using a private road, Bernal chose not to intervene when the FSD Beta system allowed the car to crash into the full-body mannequin a five-year-old child, the mannequin of a black Labrador Retriever (which has particular salience for dog guide users), and both mannequins together. After striking the mannequins, the vehicle usually continued down the road in a hit-and-run fashion. The presence of road closure signs and police caution tape across the road had no effect on the vehicle.[[29]](#endnote-29)

Most troublingly, Bernal demonstrated how easy it is to evade Tesla’s Driver Monitoring System. A giant teddy bear, a giant stuffed unicorn, and a giant Champagne balloon were all deemed sufficiently ‘human’ by the system to sit behind the wheel of a moving Tesla. On each occasion, the vehicle carried out a hit-and-run strike on the child mannequin.[[30]](#endnote-30)

To underscore the system’s ineptitude, Bernal left the driver’s seat entirely empty. His Tesla proceeded to drive through road closure signs and police caution tape and execute a hit-and-run strike on the child and dog mannequins. Tesla’s Autopilot failed to record any ‘improper use’ of the vehicle during any of these tests.[[31]](#endnote-31)

Approximately 400,000 North American Tesla drivers have access to the FSD Beta system.[[32]](#endnote-32) In May 2023, it was reported that the software had been made available for purchase in Australia for the first time.[[33]](#endnote-33)

The Dawn Project has recorded 970 crashes and 33 fatalities brought about by Tesla’s self-driving software. This includes 16 separate crashes into emergency vehicles and trucks with warning signs, causing 15 injuries and one fatality.[[34]](#endnote-34) The Dawn Project’s founder, Dan O’Dowd, was nearly killed himself when the FSD Beta system swerved his Tesla into the path of an oncoming vehicle, giving him less than a second to react.[[35]](#endnote-35)

In its present state, the FSD Beta system is not fit for purpose. The system failures described above could result in horrific accidental collisions, or even be used to carry out terrorist attacks and hit-and-run homicides. The Commonwealth government cannot allow this system onto Australian roads until Tesla completely fixes the software. This must be reflected in the Australian Design Rule (ADR 90/01).

**Recommendation:**

1. Include in the Australian Design Rule (ADR 90/01) a provision that all vehicles with driver monitoring systems are rigorously tested for pedestrian and other road users’ safety before being allowed onto Australian roads.

### 3.3 Additional safety and ethical considerations

The draft National Road Transport Technology Strategy estimates that CAVs could reduce Australian road crash costs by approximately $15 billion by 2050. This is predicated on 60 per cent of new light vehicles sold and 30 per cent of the light vehicle fleet having Level 4 or Level 5 automation at that time.

The draft Strategy forecasts that ‘passenger vehicles capable of highly automated driving’ will enter the Australian market from 2026 and constitute two per cent of new car sales by 2031. For CAVs to meet their potential in the medium to long-term, road and footpath users must have confidence that the vehicles are safe and reliable.

Level 4 automation allows the vehicle to operate completely autonomously under certain conditions. The human driver no longer has to be ready to intervene and so may work, watch video content or even sleep behind the wheel. Multiple manufacturers are already testing Level 4 vehicles in road traffic.[[36]](#endnote-36)

The aforementioned Tesla FSD Beta system functions as a Level 4, even though it has been classified by North American regulators as a Level 2 partial automation system, requiring the driver to constantly monitor the system.[[37]](#endnote-37) John Bernal and the Dawn Project have clearly demonstrated that the Tesla FSD Beta system is not currently safe or reliable enough to be permitted on Australian roads.

**Recommendation:**

1. Recognise that Level 4 automation systems are not currently safe or reliable enough to travel on Australian roads.

#### The trolley problem

Level 5 automation allows the vehicle to act completely autonomously under all conditions. The vehicle does not require a steering wheel or pedals. The human driver is officially deemed a passenger.[[38]](#endnote-38)

Tesla does not currently produce fully autonomous Level 5 CAVs, though it plans to. Australian researchers are already considering how the ‘trolley problem’ will apply to such vehicles.

The trolley problem is a thought experiment consisting of different scenarios in which sacrificing the life of one person saves another/others. There are no simple solutions to the trolley problem.

People often struggle to make decisions in life-and-death scenarios. A person’s choice can vary depending on factors such as age, gender and culture. The algorithms used by an artificial intelligence (AI) system can be influenced by the politics, ethics and morals of its country of origin. Those influences may make the system unsuitable for use in another country.[[39]](#endnote-39)

When CAVs are inevitably involved in crashes, insurers and the courts will need to understand the processes and technical parameters of the AI systems they utilise. Ideally, manufacturers would be required to disclose how their vehicles have been programmed to respond to different life-and-death scenarios before they are permitted on Australian roads.

Unfortunately, the manufacturers themselves are bewildered by the ‘black box’ of AI. Tesla’s Autopilot functionality, for example, uses ‘deep neural networks’, a popular type of AI system whose outcomes cannot be fully comprehended even by its developers.[[40]](#endnote-40)

The ‘explainable AI’ movement is seeking to develop AI systems capable of generating explanations after the fact. Before allowing fully autonomous Level 5 CAVs onto Australian roads, manufacturers must incorporate explainable AI in their vehicles.

**Recommendation:**

1. Require manufacturers to incorporate explainable AI in their Level 5 vehicles.

#### The problem of puffery

The Australian Competition and Consumer Commission (ACCC) defines puffery as ‘wildly exaggerated and vague claims about a product or service that no one could treat seriously. For example, a restaurant claims they have the “best steaks on earth.”’[[41]](#endnote-41)

Elon Musk, the chief executive officer of Tesla, often makes exaggerated claims about the safety features of his company’s vehicles.[[42]](#endnote-42) In trumpeting Tesla’s advanced airbags, Musk said:

I think we might have come full circle and no longer need seat belts if you have advanced airbags… Unbelted child sitting in a bad position – probably still fine. The seat belt is like – if you wear the seat belt – that’s nice. The airbag is doing the work. Airbag technology is crazy good.[[43]](#endnote-43)

Similarly, advertisements for General Motors’ Super Cruise system have focused on the technology’s hands-free capabilities.[[44]](#endnote-44)

Many people view these claims and advertisements as a genuine representation of the products and not as mere puffery. For example, a recent survey of 1,008 people by the sleep website Sleep Junkie found that 12.7 per cent of respondents were willing to sleep behind the wheel of a moving semi-autonomous vehicle.[[45]](#endnote-45)

The Commonwealth government must recognise that many customers take these claims and advertisements seriously, and are likely to use their CAVs in inappropriate and dangerous ways. The Commonwealth must work with its state and territory counterparts to clearly articulate the legal responsibilities of CAV drivers, regardless of the claims made by vehicle manufacturers.

**Recommendations:**

1. Recognise that many customers take the advertisements and claims made by vehicle manufacturers literally. This causes them to use their CAVs in inappropriate and dangerous ways.
2. Work with state and territory governments to clearly articulate the legal responsibilities of CAV drivers, regardless of the claims made by vehicle manufacturers.

#### The paradox of automation

The more automatic systems improve, the more human operators come to rely on them. When something goes wrong and manual takeover is necessary, human operators often do not have the skills to cope.

A tragic example of this was Air France Flight 447 on 1st June 2009. After encountering a thunderstorm and icing conditions, the pilots inadvertently stalled their Airbus A330. Unused to flying without the help of computers, the pilots were unable to recover the plane from the stall and so crashed into the Atlantic Ocean. All 228 passengers and crew were killed.[[46]](#endnote-46)

As mentioned earlier, the Dawn Project’s founder, Dan O’Dowd, was nearly killed when the FSD Beta system swerved his Tesla into the path of an oncoming vehicle, giving him less than a second to react.[[47]](#endnote-47) He had decades of personal driving experience and world-class engineering skills to draw from in that moment.

Younger drivers do not have such experience and so may not know what to do in a dangerous situation. In March 2022, for example, a 23-year-old Melbourne driver claimed her Tesla Model 3 was on Autopilot when it struck a nurse crossing the road to board a tram, causing life-threatening injuries. The P-plate driver reportedly told detectives she thought she had more time to stop than she actually did.[[48]](#endnote-48)

A recent study of 600 General Motors, Tesla and Nissan drivers in the United States found that 53 per cent of Super Cruise, 42 per cent of Autopilot and 12 per cent of ProPILOT Assist owners were comfortable treating their vehicles as fully self-driving. As such, they were comfortable eating and texting whilst driving.[[49]](#endnote-49) These drivers were evidently not prepared for a life-and-death moment when they would need to assume manual control.

To reiterate Recommendation 12, the Commonwealth government must work with its state and territory counterparts to clearly articulate the legal responsibilities of CAV drivers – both here and now, and in the future.

## 4. Summary of Recommendations

In response to the draft National Road Transport Technology Strategy and the draft 2024–27 National Connected and Automated Vehicle (CAV) Action Plan, BCA makes the following recommendations to the Commonwealth government:

1. Collaborate with state, territory and local governments to improve the design and maintenance of Australia’s roads.
2. Collaborate with state, territory and local governments to invest in infrastructure specifically designed for changing climate conditions.
3. Nudge consumers away from purchasing SUVs by scaling back the tax incentives for such vehicles and working with state, territory and local governments to create more small-car only parking spots.
4. Amend Australia’s public lighting standard, AS/NZS 1158, to increase the brightness of residential streets.
5. Ensure Australia’s unique automotive market and road safety needs are met by continuing to work with the domestic Ford and Toyota design studios.
6. Amend the Transport Standards to provide appropriate regulation of CAV taxi, rideshare and public transport services. These amendments must be co-designed with people with disability and disability representative organisations.
7. Include in the Australian Design Rule (ADR 90/01) a provision that vehicle manufacturers must include people with disability in the datasets used to train and test CAVs.
8. Include in the Australian Design Rule (ADR 90/01) a provision that all vehicles with driver monitoring systems are rigorously tested for pedestrian and other road users’ safety before being allowed onto Australian roads.
9. Recognise that Level 4 automation systems are not currently safe or reliable enough to travel on Australian roads.
10. Require manufacturers to incorporate explainable AI in their Level 5 vehicles.
11. Recognise that many customers take the advertisements and claims made by vehicle manufacturers literally. This causes them to use their CAVs in inappropriate and dangerous ways.
12. Work with state and territory governments to clearly articulate the legal responsibilities of CAV drivers, regardless of the claims made by vehicle manufacturers.
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