



# Blind Citizens Australia

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## **Response to the Consultation Impact Analysis for Improving Pedestrian Safety – Acoustic Vehicle Alerting Systems for Electric Vehicles**

Lodged via: <https://www.infrastructure.gov.au/have-your-say/acoustic-vehicle-alerting-systems-electric-vehicles>

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## 1. Introduction

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### 1.1 About Blind Citizens Australia (BCA)

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% of vision loss in Australia is caused by conditions that become more common as people age.<sup>1</sup>

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

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BCA welcomes the opportunity to make a submission to the Department of Infrastructure, Transport, Regional Development, Communications and the Arts' (the Department's) proposal to mandate Acoustic Vehicle Alerting Systems (AVAS) for new electric, hydrogen fuel cell and hybrid vehicles in Australia.

In this submission, BCA strongly recommends the introduction of AVAS for **all** electric, hydrogen fuel cell and hybrid vehicles in Australia. As requested by the Consultation Impact Analysis paper, BCA's submission provides pertinent information to assist decision-making in this area.

BCA's submission is based on existing legislation and frameworks:

- Road Vehicle Standards Act 2018 (Cth)

- The National Electric Vehicle Strategy (the Strategy)
- Australia’s Disability Strategy 2021–2031
- United Nations Regulation No. 138/01 (UN R138/01)
- United Nations Convention on the Rights of Persons with Disabilities (UNCRPD)

Unveiled in April 2023, the National Electric Vehicle Strategy (the Strategy) aims to accelerate the transition from petrol- and diesel-powered internal combustion engines (ICEs) to electric vehicles (EVs). This transition is essential for the decarbonisation of Australia’s road transport sector.

According to the Strategy, EVs accounted for 3.8 per cent of new car sales in Australia in 2022, an 86 per cent increase from 2021. Experts expect EVs to constitute 90 per cent of Australia’s entire vehicle fleet by 2050.<sup>2</sup>

Even without the Strategy, the international regulatory environment will compel Australian motorists to purchase EVs in the near future. The European Union has announced an effective ban on the sale of petrol and diesel cars by 2035. Japan, China, Hong Kong and Canada have foreshadowed similar restrictions.<sup>3</sup>

Whilst BCA welcomes measures that will help address concerns about fuel scarcity and the environmental impact of carbon emissions from ICEs, we have already expressed our serious concerns around the potential of EVs to severely compromise the safety of all pedestrians – especially people who are blind or vision impaired.<sup>4</sup>

Decision-makers are aware of these concerns, as noted in the Strategy:

The Government is consulting to consider the case for mandatory Acoustic Vehicle Alerting Systems for light electric vehicles in Australia, to reduce potential pedestrian collisions. Adopting international standards setting minimum sound requirements for EVs could help ensure pedestrians who are blind or low vision can travel with relative safety and independence when crossing roads and using footpaths.<sup>5</sup>

Furthermore, as a signatory to the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), governments in Australia have an obligation to monitor and eliminate safety hazards to ensure the wellbeing of people with disability. In particular, ‘Article 9 – Accessibility’ requires State Parties to take

appropriate measures to ensure that people with disability have equal access to the physical environment in both urban and rural areas, and mandates the ‘identification and elimination of obstacles and barriers to accessibility.’

The UNCRPD is operationalised in Australia through Australia’s Disability Strategy 2021–2031, which rightly acknowledges the importance of having a community that is accessible and inclusive, noting that areas that are not accessible ‘exclude people with disability from participation in work, education, and social and cultural life.’

Australia’s Disability Strategy commits to ensuring 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**

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### **3.1 Issues and concerns with EVs**

Historically, the sounds emitted by road traffic has enabled pedestrians who are blind or vision impaired to travel with relative safety and independence when crossing roads and using footpaths. As a study on the built environment from Western Michigan University explains:

Traffic flow can tell a person whether a street is one way or two way, how wide a street is, how close a person is to an intersection, and how close a person is to the street. All of these bits of information, combined with knowledge of how a city is laid out, allows a person to determine approximately where they are and perhaps even what direction they are walking.<sup>6</sup>

This information has been used by people who are blind or vision impaired for decades, with specific knowledge, techniques and skills being developed and taught by orientation and mobility specialists to help take advantage of that traffic flow information.

However, as technology improves and EVs and hybrid vehicles – known collectively as Quiet Road Transport Vehicles (QRTVs) – form a greater proportion of traffic, much of this vital navigational information will be lost and the risks of serious injury or death for people who are blind or vision impaired will continue to rise.

Research conducted in 2018 with people who are blind or vision impaired, by Monash University Accident Research Centre (MUARC) in conjunction with Vision Australia, revealed:

- 75 per cent of participants regularly walk, daily or almost daily. Of these participants, 42 per cent walk outside unassisted and 58 per cent walk outside assisted. Most of those walking outside assisted do so by using a white cane.
- 35 per cent of participants experienced a collision or near collision with QRTVs.
- 74 per cent of participants reduced confidence due to the introduction of QRTVs.<sup>7</sup>

For those with partial hearing loss, the issue of hybrid and electric cars being silent is particularly pertinent, and a natural consequence of an ageing population will also be increased prevalence of hearing loss in addition to vision impairment.

QRTVs also pose a significant danger to people who are not disabled. In 2011, the National Highway Traffic Safety Administration (NHTSA) in the United States revealed that EVs and hybrids had a 35 per cent greater likelihood of accidents with pedestrians, and a 50 per cent greater likelihood of accidents with cyclists. The majority of these incidents occurred in carparks and driveways, when a driver was reversing or turning at low speed.<sup>8</sup>

The batteries that power QRTVs make for much heavier – and therefore dangerous – vehicles. The Ford Mustang Mach-E Electric SUV and the Volvo XC40 EV, for example, are both 33 per cent heavier than their petrol-powered equivalents.

In 2011, the National Bureau of Economic Research in the United States published a paper which indicated that being struck by a vehicle with an added 1,000 pounds (454 kilograms) increased the likelihood of death by 47 per cent.<sup>9</sup>

The weight problem is compounded by the fact that EVs are quicker off the mark than traditional ICE vehicles. EVs generate much more torque than diesel- or petrol-powered vehicles. EV motors also eliminate the need for a traditional transmission, allowing the power to go straight to the wheels. Ultimately, this means that EV drivers, who have not been trained to handle such power, can accelerate quickly even in crowded urban areas.<sup>10</sup>

In recognition of the dangers posed by QRTVs, most major vehicle markets – including the European Union, the United Kingdom, the United States, Japan, South Korea and China – already mandate AVAS systems for such vehicles.

**Recommendation:**

1. **All** electric, hydrogen fuel cell and hybrid vehicles registered in Australia must be installed with an Acoustic Vehicle Altering System (AVAS), without a pause function or off-switch.

## 3.2 Suitability of United Nations Regulation 138/01

United Nations Regulation No. 138/01 (UN R138/01) is a 40-page document which outlines the ‘Uniform provisions concerning the approval of Quiet Road Transport Vehicles with regard to their reduced audibility.’ It entered into force on 10 October 2017.

The Consultation Impact Analysis paper seeks feedback on the suitability of adopting UN R138/01 as a new Australian Design Rule (ADR) under the Road Vehicle Standards Act 2018 (Cth).

### Speed range for AVAS operation

Specification 6.2 of UN R138/01 concerns acoustic characteristics. According to this specification, ‘The speed range for [AVAS] operation is the range of greater than 0 km/h up to and inclusive 20 km/h.’ BCA believes this range of operation must be extended.

According to Lex Brown, an urban sounds expert at Griffith University, a QRTV travelling in excess of 30 km/h sounds much the same as a traditional ICE vehicle, as the noise is generated from the tyres vibrating against the road rather than the engine. Below that speed, however, it becomes barely audible.<sup>11</sup>

Other scholars agree that it is at speeds of over 30 km/h where the noise of tyre friction overcomes the noise of a traditional engine.<sup>12</sup>

BCA echoes the concerns of the Royal National Institute of Blind People in the United Kingdom, that QRTVs might still be too quiet when travelling at 20 km/h without the sound of an AVAS. The need for AVAS to sound at higher speeds has already been recognised in the United States, where they are required for speeds up to 30 km/h.<sup>13</sup>

### Sounds generated by AVAS when in operation

The sub-sections of specification 6.2 describe the sounds that shall be omitted by AVAS when in operation. BCA agrees that AVAS should make a sound when the vehicle is moving forward or reversing. BCA believes a sound should also be made when the car is stationary or idling.

BCA recommends that the Department take a common sense approach – that is, a QRTV should sound similar to a traditional ICE vehicle.

In advocating this position, BCA concurs with John Paré, the executive director for advocacy and policy at the National Federation of the Blind in the United States. As Paré explains, QRTVs have to ‘sound to some degree like cars – otherwise, the alerts won’t provide safety. Society has already been trained to know what cars sound like.’<sup>14</sup>

BCA is aware that vehicle manufacturers have already designed proprietary AVAS systems with woodwind instruments, flutes, clarinets, synthesisers and human voices. The sounds produced by the layering of these inputs are ethereal and even beautiful, but they do not sound like those generated by a traditional ICE vehicle.

If these experimental sounds are permitted under a national AVAS framework, it is incumbent on the Department to fund and collaborate with state and territory road safety commissions, along with disability representative organisations, on an extensive awareness campaign. AVAS can only be truly effective if pedestrians know what moving vehicles sound like in the modern era.

BCA reminds the Department that Tesla had to recall nearly 579,000 vehicles in the United States in 2022 because of the ‘Boombbox’ function that played sounds over an



external speaker and obscured audible warnings for pedestrians.<sup>15</sup> The United States has since banned customisable sounds, and Australia should do likewise.

**Recommendations:**

2. AVAS be operational at the range of greater than 0 km/h up to and inclusive **30 km/h**, as well as when the vehicle is reversing, stationary or idling.
3. AVAS produce sounds similar to those of a vehicle with an internal combustion engine.
4. If a national AVAS framework permits non-traditional sounds, that the Department fund and collaborate with state and territory road safety commissions and disability representative organisations on an extensive awareness campaign.
5. Banning external speakers and customisable sounds capable of obscuring audible warnings for pedestrians.

### 3.3 Benefit–cost analysis

#### Fewer pedestrian crashes with AVAS

Every human life is immeasurably valuable. AVAS will save lives.

Pedestrian road crashes have a significant economic impact, costing the Australian community more than \$1.2 billion each year.<sup>16</sup> As noted in Section 1.2.2 of the Consultation Impact Analysis paper, the personal costs for pedestrian victims and near-victims who are blind or vision impaired include higher incidences of anxiety and depression.

The mandatory fitment of AVAS would avert some of these costs. As cited in Section 4 of the Consultation Impact Analysis paper, MUARC has ‘estimated around 17.7 per cent of pedestrian crashes involving an electric vehicle in low speed conditions could be avoided if all electric vehicles in Australia were fitted with an AVAS.’

Section 4 of the paper also explains that a mandatory fitment of AVAS for light vehicles in Australia ‘would avoid 65 deaths, 2,569 serious injuries, and 2,845 minor injuries over the 35-year analysis period. This would amount to over \$321 million in avoided road trauma costs.’ Other vulnerable road users, such as cyclists, would also benefit directly from AVAS.

## Wider social benefits of AVAS

As outlined in Section 4.4 of the Consultation Impact Analysis paper, many other segments of Australian society are set to benefit from AVAS.

Employers would benefit from a reduction in the number of workdays lost due to employees injured by collisions with EVs, as well as a reduction in the number of employees killed or permanently incapacitated by collisions.

With fewer pedestrian crashes, vehicle owners would spare themselves significant psychological trauma and save on costs like vehicle repair and replacement, compensation, and legal fees.

Fewer pedestrian crashes would alleviate some of the burden on public health systems. Fewer individuals would have to cope with the physical and mental trauma, medical costs, and lost income that come with crashes.

People who are blind or vision impaired would particularly benefit from AVAS. They would have greater confidence to walk on and near roads, allowing greater economic and social participation. This in turn would produce mental health benefits, particularly with regard to anxiety and depression.

## Costs worth paying

Section 5 of the Consultation Impact Analysis paper puts the average annual regulatory costs of mandatory fitment of AVAS at \$17.8 million.

Section 4.2 of the paper estimates the cost to fully develop an AVAS for a new vehicle model at \$50,000 to \$100,000. Given that all light vehicles in Australia are now imported, and that most come from markets that have already mandated UN R138/01 (or equivalent standards), the costs of compliance would likely be significantly less than this amount.

According to the NHTSA estimates cited in Section 4.2, AVAS fitment costs would be negligible. It would only cost approximately \$77 for vehicles where an AVAS has already been developed and \$182 for vehicles without an AVAS developed. Likewise, sensitivity tests would cost \$182 at the upper limit.

**Recommendation:**

6. Recognition of the immense benefits of AVAS in human, economic, health and social terms; that the costs of AVAS are reasonable and worth paying to save lives; and that the mandatory fitment of AVAS is therefore sensible and compassionate public policy.

### 3.4 The necessity of AVAS for heavy vehicles

Despite making up just four per cent of the national vehicle fleet, heavy vehicles are responsible for 25 per cent of all vehicle emissions in Australia.<sup>17</sup> Electrifying heavy vehicles fleets is thus a priority for the Australian government and industry.

In December 2022, the Australian Renewable Energy Agency announced \$20.1 million in funding to Team Global Express for the 'Depot of the Future' project, which will see Global Express deploy 60 electric trucks across its transport and logistics network in western Sydney.<sup>18</sup>

BCA strongly argues that all such heavy vehicles be fitted with AVAS. When AVAS has been mandated for heavy vehicles overseas, vehicle manufacturers have embraced the challenge of developing new acoustic systems. To meet the Europeans Union's AVAS regulations, for example, Volvo Trucks developed a unique set of sounds for its electric truck models.

The Volvo Trucks' AVAS uses four different sounds to inform people close by about what the truck is doing: idling, moving forward, reversing, etc. The sounds vary in intensity based on travelling speed, and shift in frequency during acceleration and deceleration. Importantly, these sounds are designed to not penetrate through walls, allowing Volvo Trucks to be used for quiet night-time deliveries and contribute to better working conditions.<sup>19</sup>

As a final point, public transport operators are starting to decarbonise traditional bus services. In keeping with the recommendations of this submission, BCA strongly reiterates its support for the installation of AVAS on electric buses.<sup>20</sup>

**Recommendation:**

7. **All** electric trucks and buses registered in Australia be installed with an AVAS, without a pause function or off-switch.

### 3.5 The necessity of AVAS for Personal Mobility Devices

In recent years there has been rapid and significant growth in the popularity and availability of e-scooters and other Personal Mobility Devices (PMDs), whilst legislation and regulation has struggled to keep up. PMDs or 'e-ridables' are broad terms that can refer to a wide range of electric powered devices, including e-scooters, electric unicycles, electric skateboards, 'hoverboards' and Segways.

BCA recognises the ongoing role PMDs are likely to play as a way of providing a practical, ecological and economical alternative to city traffic, and as 'last-mile' transportation to help bridge connections within public transport networks.

However, these devices can pose significant risks to people who are blind or vision impaired. The foremost of those concerns is the difficulty detecting e-scooters approaching as they run almost silently and are capable of speeds of at least 25 km/h, with some on the market reportedly reaching speeds of up to 90 km/h.

International research has indicated that e-scooters could be three times more dangerous than cycling, with riders engaging in anti-social behaviour including using devices on footpaths, travelling too fast, racing other riders and performing dangerous stunts.<sup>21</sup> Additionally, use of scooters under the influence of alcohol has increased safety concerns given the dangers to both pedestrians and riders themselves.<sup>22</sup> We believe steps must be taken to reduce the risk of the near silent operation of PMDs by extending the mandatory installation of AVAS to all PMDs.

**Recommendation:**

8. **All** e-scooters and other Personal Mobility Devices (PMDs) sold in Australia be installed with an AVAS, without a pause function or off-switch.

## 4. Recommendations

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In order to ensure the safety of people who are blind or vision impaired and other members of the community in relation to electric vehicles (EVs), BCA strongly recommends that:

1. **All** electric, hydrogen fuel cell and hybrid vehicles registered in Australia be installed with an Acoustic Vehicle Altering System (AVAS), without a pause function or off-switch.
2. AVAS be operational at the range of greater than 0 km/h up to and inclusive **30 km/h**, as well as when the vehicle is reversing, stationary or idling.
3. AVAS produce sounds similar to those of a vehicle with an internal combustion engine (ICE).
4. If a national AVAS framework permits non-traditional sounds, the Department must fund and collaborate with state and territory road safety commissions on an extensive awareness campaign.
5. Banning external speakers and customisable sounds capable of obscuring audible warnings for pedestrians.
6. Recognition of the immense benefits of AVAS in human, economic, health and social terms; that the costs of AVAS are reasonable and worth paying to save lives; and that the mandatory fitment of AVAS is therefore sensible and compassionate public policy.
7. **All** electric trucks and buses registered in Australia be installed with an AVAS, without a pause function or off-switch.
8. **All** e-scooters and other Personal Mobility Devices (PMDs) sold in Australia be installed with an AVAS, without a pause function or off-switch.

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<sup>2</sup> CarExpert, "Blind People Want Louder Electric Vehicles," 29 March 2023, <https://www.carexpert.com.au/car-news/blind-people-want-louder-electric-cars>

<sup>3</sup> The Canberra Times, "Petrol Car Ban Will Force Aussie Drivers to Go Electric," 15 February 2023, <https://www.canberratimes.com.au/story/8087428/petrol-car-ban-will-force-aussie-drivers-to-go-electric/>

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<sup>8</sup> The New Yorker, “What Should a Nine-Thousand-Pound Electric Vehicle Sound Like?” 1 August 2022, <https://www.newyorker.com/magazine/2022/08/08/what-should-a-nine-thousand-pound-electric-vehicle-sound-like>

<sup>9</sup> AP News, “US Official Warns of Risks Posed By Heavy Electric Vehicles,” 12 January 2023, <https://apnews.com/article/technology-road-safety-national-transportation-board-automotive-accidents-dd5c4260f68e9f5dcb430a02cc939f6b>

<sup>10</sup> Fortune, “Tesla Veteran Explains How Electric Motors Crush Gas Engines,” 18 November 2015, <https://fortune.com/2015/11/17/electric-motors-crush-gas-engines/>

<sup>11</sup> The Guardian Australia, “Flutes, Synths, A Human Voice – How Should Electric Vehicles Sound?” 5 January 2023, <https://www.theguardian.com/environment/2023/jan/05/flutes-synths-a-human-voice-how-should-electric-vehicles-sound>

<sup>12</sup> María Carmen Pardo-Ferreira, Juan Antonio Torrecilla-García, Carlos de las Heras-Rosas, and Juan Carlos Rubio-Romero, “New Risk Situations Related to Low Noise from Electric Vehicles: Perception of Workers as Pedestrians and Other Vehicle Drivers,” International Journal of Environmental Research and Public Health, September 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7558663/>

<sup>13</sup> Royal National Institute of Blind People, “New Electric Vehicles Must Generate Sound,” 7 July 2021, <https://www.rnib.org.uk/news/new-electric-vehicles-safety-milestone/>

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<sup>15</sup> The Guardian Australia, “Tesla Recalls 579,000 US Cars and SUVs Over ‘Boombox’ Safety Violations,” 11 February 2022, <https://www.theguardian.com/technology/2022/feb/10/tesla-recall-cars-suvs-boombox-function>

<sup>16</sup> Vision Australia, “Vision Australia Makes Noise on EVs,” 28 March 2023, <https://www.visionaustralia.org/community/news/2023-03-28/vision-australia-makes->

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<sup>18</sup> Australian Renewable Energy Agency, “Depot of the Future Delivers Australia’s Largest Electric Vehicle Logistics Fleet,” 6 December 2022, <https://arena.gov.au/news/depot-of-the-future-delivers-australias-largest-electric-vehicle-logistics-fleet/>

<sup>19</sup> Volvo Trucks, “Volvo Trucks Adds Unique Sounds to Its Electric Trucks,” 27 May 2021, <https://www.volvotrucks.com/en-en/news-stories/press-releases/2021/may/volvo-trucks-adds-unique-sounds-to-its-electric-trucks.html>

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