Barriers to the safe use of innovative vehicles and motorised mobility devices

January 2019

Issues paper

National Transport Commission

Report outline

Title	Barriers to the safe use of innovative vehicles and mobility devices
Type of report	Issues paper
Purpose	The purpose of this paper is to engage the Australian public to understand the extent to which there are regulatory barriers to the safe use of innovative vehicles and motorised mobility devices (MMDs).
Abstract	In May 2018, the Transport and Infrastructure Council (the Council) directed the National Transport Commission (NTC) to review the Australian Road Rules (ARRs) and highlight any regulatory barriers to the safe use of innovative vehicles and motorised mobility devices across Australia.
Submission details	Submissions will be accepted until **Thursday 28 February 2019** online at www.ntc.gov.au or by mail to: Attn: Anthony Pepi Productivity and Safety Team National Transport Commission Level 3/600 Bourke Street Melbourne VIC 3000
Key words	Innovative vehicles, personal electric transport devices, motorised mobility devices, barriers, road safety, electric scooters, motorised wheelchairs
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Purpose

The purpose of this issues paper is to investigate the extent to which regulatory barriers exist in the Australian Road Rules (ARRs) and other relevant legislation that may inhibit the safe use of innovative vehicles and motorised mobility devices (MMDs).

The paper:

- seeks to reach a complete and common understanding of the problem
- reviews the current Australian Road Rules and other relevant legislation that affect the ARRs regarding the safe use of innovative vehicles and motorised mobility devices
- recognises recent work completed by various parties relating to the use and safety of motorised mobility devices, and
- identifies and provides an analysis of the key issues to consider as part of the project, prior to developing potential solutions.

We are also seeking your feedback (and any relevant data and evidence) to ensure all key issues have been identified and captured.

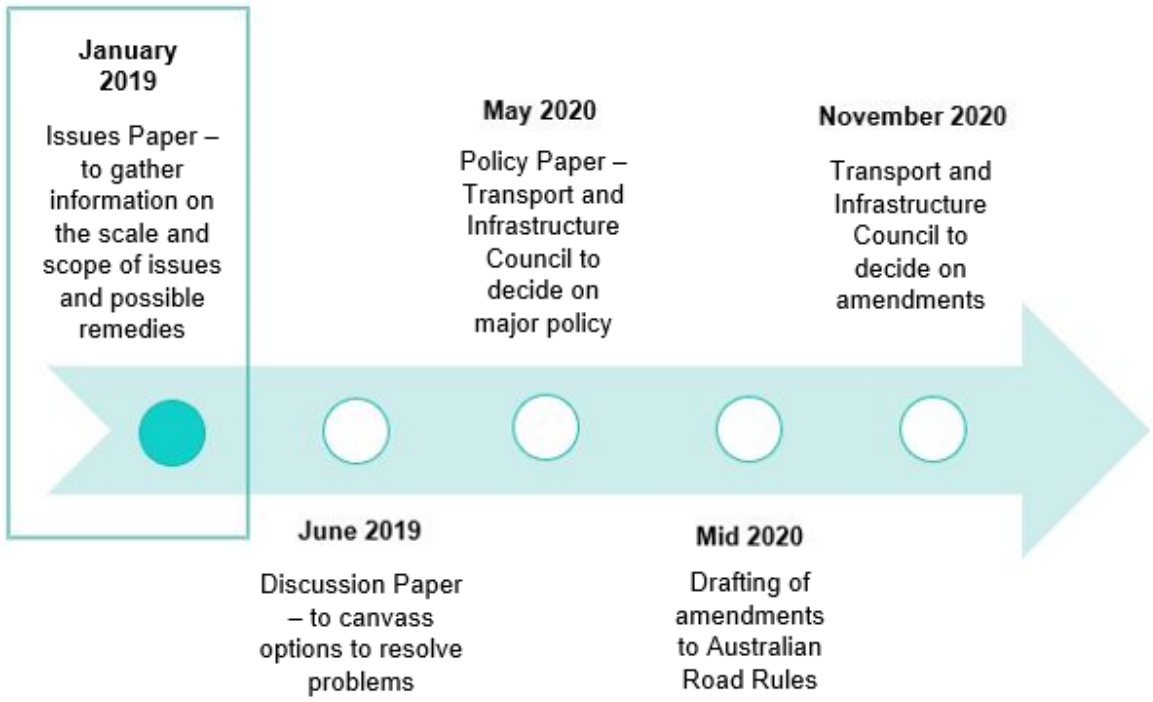
Executive summary

Context

In May 2018, the Transport and Infrastructure Council (the Council) directed the National Transport Commission (NTC) to review the Australian Road Rules (ARRs) to identify regulatory barriers that are preventing the safe and legal use of innovative vehicles such as electric skateboards, scooters, unicycles, and motorised mobility devices (MMDs) such as motorised wheelchairs and mobility scooters.

This project seeks to investigate, identify and understand any barriers that may inhibit the safe use of innovative vehicles and motorised mobility devices. Once identified, a nationally-consistent approach to address the barriers will be developed. The project aims to provide rules that encourage safe and easy access for all innovative vehicles and motorised mobility devices to Australian roads and road-related areas.

Chapter 1 details the project objectives, the desired outcome, process and proposed timeframes. The NTC process will be consultative and transparent. The key deliverables and milestones are outlined in the diagram below.



The problem

The current regulatory framework regarding the use of innovative vehicles and motorised mobility devices is outdated and does not accommodate the safe use of these devices. The design and capacity of the road system to cater for a diverse range of vehicles in Australia is increasingly being tested with additional demand for access by new categories of vehicles (Staysafe, 2014).

The framework, as described in section 2.4, predates the general availability of innovative vehicles and motorised mobility devices, and is based largely on the three main types of available passenger vehicles – cars, motorcycles and bicycles.

The result is a highly prescriptive set of ad-hoc road rules relating to cars, motorcycles and bicycles that have been developed over the years to address particular issues as they have arisen.

The use of innovative vehicles and motorised mobility devices results partly from demand by commuters for alternative forms of travel in response to increasing transport costs and increasing commute times caused by congestion. This use reflects a growing emphasis on enabling people of all ages and abilities with the freedom to remain mobile and retain their independence and connections with the community. However, the increasing use of innovative vehicles and motorised mobility devices impacts other vulnerable road and road-related area users, as well as the device users themselves (Staysafe, 2014).

Stakeholders are invited to consider the questions listed in this paper and to provide feedback (and any relevant data and evidence) to ensure we have identified the relevant barriers to the safe use of innovative vehicles and motorised mobility devices to inform our investigation.

Issues

Chapters 3 and 4 of this paper outline issues we currently believe need to be considered to enable the safe use of innovative vehicles and motorised mobility devices on roads and road-related areas.

Innovative vehicles

- Risk of conflict between different road users due to the increased use of innovative vehicles.
- The use of innovative vehicles is illegal in most jurisdictions.
- A lack of national consistency could create confusion for industry and the community.
- Limited understanding of the safety risks associated with innovative vehicle use.

Motorised mobility devices

- The Australian Road Rules do not provide for the legal use of many devices that are available today.
- Current motorised mobility device classifications in the Australian Road Rules are not clear.
- Some motorised mobility devices may not be compatible with public spaces and transport infrastructure.
- Limited understanding of the safety risks associated with motorised mobility device use.

List of questions for comment

1. What characteristics need to be considered when defining what an innovative vehicle is?
2. What differences between motorised wheelchairs and mobility scooters need to be recognised by this project?
3. What uses of innovative vehicles need to be considered as part of this investigation?
4. What key factors need to be considered when determining safe rules of operation (including speed) for innovative vehicles on roads and road-related areas?
5. What are the practical and measurable outcomes required from a nationally-consistent policy and regulatory framework for innovative vehicles?

6. What evidence-based distinctions between acceptable and unacceptable levels of risk associated with the use of innovative vehicles could be considered to inform the way innovative vehicles are regulated?
7. What barriers and health or safety risks are associated with the use of a motorised mobility device that does not meet the needs of a user because of the current restrictions?
8. How do current classifications of drivers of wheelchairs as both ‘pedestrians’ and ‘vehicles’ in the Australian Road Rules create confusion?
9. Is there a need for construction and performance requirements for motorised mobility devices to ensure safe use on public transport infrastructure?
10. What evidence is available on the road safety risks associated with motorised mobility devices that could be used to inform the way motorised mobility devices are regulated?

We are inviting comments, data and evidence in response to the above issues and/or any other relevant issues until **Thursday 28 February 2019**.

The NTC will use stakeholder feedback to this issues paper to develop a discussion paper for release in June 2019.

1 Context

Key points

- The National Transport Commission (NTC) is reviewing the Australian Road Rules (ARRs) to identify if any regulatory barriers exist that prevent the safe use of innovative vehicles and motorised mobility devices (MMDs).
- This paper provides an overview of the problem, the current regulatory framework applicable to innovative vehicles, and seeks to clarify the key issues to establish the appropriate case for action ahead of developing potential solutions.
- Any individual or organisation can offer evidence, data or make a submission to the NTC on this issues paper by **Thursday 28 February 2019**.

1.1 Project objectives and desired outcome

The purpose of this project is to investigate whether any regulatory barriers exist in the Australian Road Rules (ARRs) and other relevant legislation that may be preventing the safe and legal use of innovative vehicles and motorised mobility devices (MMDs).

The project will:

- review the current vehicle classifications and approval processes in Australia to identify any regulatory barriers to the use of innovative vehicles
- seek to understand the approaches and vehicle classifications used overseas to regulate innovative vehicles and motorised mobility devices, and
- if there is a need to address any regulatory barriers found, develop options for a consistent and efficient national framework that allows safe innovative vehicles and motorised mobility devices to be used on roads and road-related areas in Australia.

The project will encompass vehicles and motorised mobility devices which are capable of being driven, ridden or operated on a road or road-related area. Examples of these vehicles are detailed in Chapter 2.

Vehicles outside the scope of this project

Some jurisdictions provide for the limited use of certain specialised vehicles on roads and road-related areas, such as golf buggies, quad bikes and ride-on lawn mowers. Each jurisdiction has specific conditions regarding the use of these specialised vehicles. These types of vehicles are not included in the scope of this project.

Issues paper

This paper focuses on identifying the barriers limiting the safe use of innovative vehicles and motorised mobility devices. In particular, this paper:

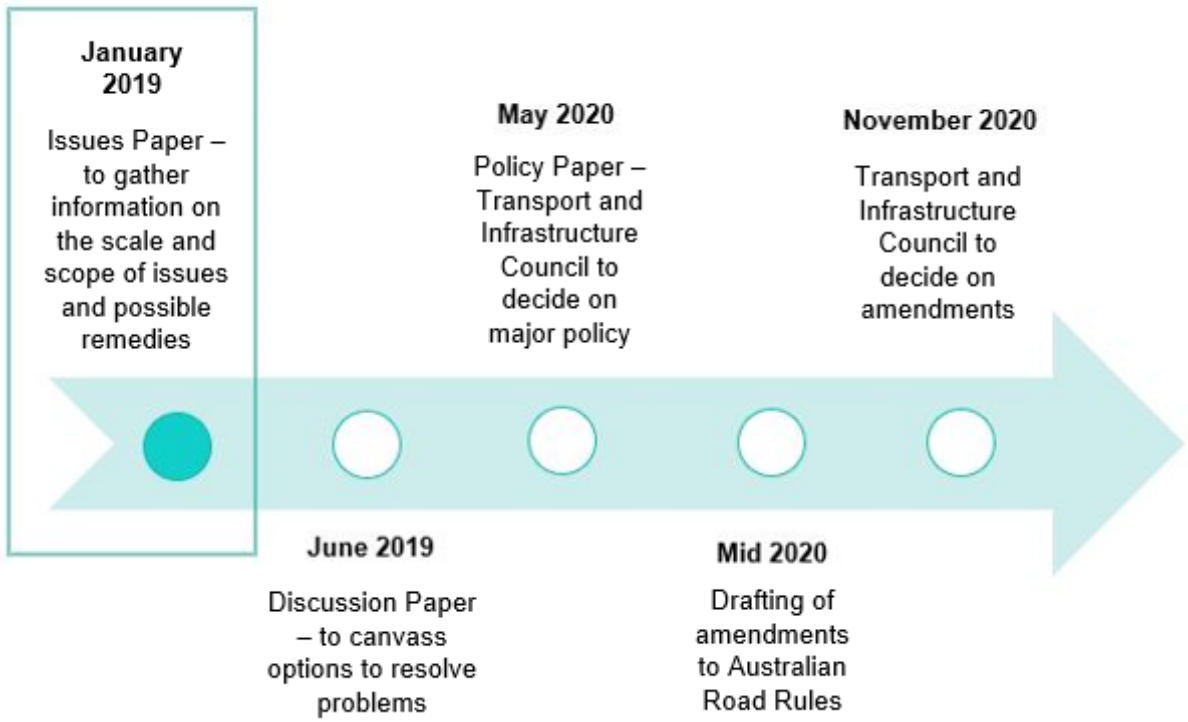
- seeks to reach a complete and common understanding of the problem
- reviews the current Australian Road Rules and other relevant legislation that relate to and impact on the safe use of innovative vehicles and motorised mobility devices
- recognises recent work completed by various parties relating to the use and safety of motorised mobility devices and innovative vehicles, and
- identifies and provides an analysis of the key issues to consider as part of the investigation, to assess the most appropriate case for action, prior to developing potential solutions.

Throughout the issues paper, we are seeking your feedback (and any relevant data and evidence) to ensure we have identified and captured all the relevant key issues that will inform our assessment of the most appropriate action.

1.2 Process and proposed time frame

There will be five steps to the process which will be conducted in a consultative and transparent manner. The deliverables and time frame are outlined in **Figure 1** below.

Figure 1. Project time frame



1. **Issues paper**

The first step is the publication of this issues paper, with an invitation to stakeholders to provide their input. It is the opportunity to define the problem, to identify and understand the key issues that require further analysis, and to establish the appropriate case for action to respond to the problem.

2. **Discussion paper**

The project team aims to prepare a discussion paper for release in June 2019. This will include a complete assessment of the case for action, will provide a range of options, and will involve public consultation. In November 2018, stakeholders provided diverse perspectives and insightful recommendations at a national workshop that will also inform this paper.

3. **Policy paper**

In November 2019, the NTC is scheduled to begin to prepare a draft policy paper. The development of this paper will involve targeted consultation with state and territory governments, as well as industry stakeholders, peak bodies and relevant associations. This paper will contain draft policy and regulatory recommendations.

The final policy paper including policy recommendations will be presented to the Transport and Infrastructure Council (the Council) at its May 2020 meeting.

4. **Australian Road Rules amendments**

Drafting of any required legislative amendments to the ARRs will commence in mid-2020. Legislative amendments to the ARRs will be presented to the Council for approval at the November 2020 Council meeting.

1.3 Consultation

The views of a broad range of stakeholders are crucial to guide policy development. As such we are asking stakeholders to consider the questions asked in this paper.

However, those questions are provided as a guide only. Stakeholders are welcome to provide us with feedback on any aspect of the issues paper.

You may also wish to consider the following questions:

- Has the problem been accurately identified?
- What are the likely costs and operational consequences of the problem for government bodies, businesses/operators and other organisations?
- What are the likely costs and operational impacts of the problem on the broader community?
- Is government action needed?
- What are the broad options for reform?
- Are there issues that have not been identified in the paper?

1.3.1 When to submit

We are seeking submissions on this issues paper by **Thursday 28 February 2019**. We will consider submissions in the development of a discussion paper and final policy paper.

1.3.2 How to submit

Any individual or organisation can make a submission to the NTC.

To make an online submission, please visit www.ntc.gov.au and select ‘Submissions’ from the top navigation menu.

Or, you can mail your comments to:

Attn: Anthony Pepi
Productivity and Safety Team
National Transport Commission
Level 3, 600 Bourke Street
Melbourne VIC 3000

Where possible, you should provide evidence, such as data and documents, to support your views.

Unless you clearly ask us not to, we will publish all submissions online. However, we will not publish submissions that contain defamatory or offensive content.

The *Freedom of Information Act 1982* (Cwlth) applies to the NTC.

2 The problem

Key points

- Limitations may exist in the current Australian Road Rules (ARRs) that prevent the safe and appropriate use of new and existing innovative vehicles and motorised mobility devices (MMDs) on Australia's road and road-related areas.
- Public demand for the use of innovative vehicles and motorised mobility devices is expected to grow. Increased use of these devices may result in potential risks to both users and other road and road-related area users.
- Enabling people of all ages and abilities with the freedom to be mobile, independent and socially-included is a priority.

The current regulatory framework regarding the use of innovative vehicles and motorised mobility devices (MMDs) is outdated and does not accommodate the safe use of these devices. The design and capacity of the road system to cater for a diverse range of vehicles in Australia is increasingly being tested with additional demand for access by new categories of vehicles (Staysafe, 2014).

The framework, as described in section 2.4, pre-dates the general availability of innovative vehicles and motorised mobility devices and is based largely on the three main types of passenger vehicles – cars, motorcycles and bicycles – that have traditionally been available. The result is a highly prescriptive set of ad-hoc road rules that have been developed over the years to address particular issues as they have arisen.

We have identified a number challenges for governments, the public, industry and retailers, which are created or amplified by the limitations in the Australian Road Rules (ARRs).

These challenges include:

- The demand for and diversity of innovative vehicles on our roads could to continue to grow.
- The public may purchase innovative vehicles and motorised mobility devices that are illegal to operate in their home state.
- Users of motorised mobility devices may not be aware of the different requirements for operating their device depending on specific circumstances.
- Existing public spaces and transport infrastructure may not accommodate some of the motorised mobility devices available in the market.
- The risks associated with the use of innovative vehicles and MMDs is not well documented.

These challenges present several issues for both innovative vehicles and motorised mobility devices which will be discussed in Chapters 3 and 4 of this paper.

2.1 Exploration of innovative vehicles and motorised mobility devices

This paper explores the issues for innovative vehicles and motorised mobility devices separately. This approach allows us to recognise the differences in their use and the different groups of users that benefit from them (as well as their needs and challenges).

For innovative vehicles, the user group is likely members of the broader public seeking a convenient, low-cost alternative for short trips. These include commuters who need a 'last-

mile' solution at the beginning and/or end of their public transport trip, as well as anyone making short trips to the shops or to access education and other services. These users are likely to have the ability to choose between a wide range of travel options.

There are two user categories for motorised mobility devices. Motorised wheelchairs are designed to carry people with a physical disability. These users have greater mobility needs than users of innovative vehicles and mobility scooters as they commonly require assistance getting into/out of the wheelchair. Their greater mobility needs make them the user category with the least travel options available.

Mobility scooters are intended for users with limited mobility who do not require assistance getting into/out of their vehicle. These are generally older people, or people who have a permanent or long-term physical limitation but have sufficient mobility to walk short distances (RRATRC, 2018). This means their mobility needs are not as great as users of motorised wheelchairs and therefore can access a larger range of travel options. However, they likely have less travel options available that users of innovative vehicles.

These differences in users and their travel needs will require close consideration when developing potential regulatory solutions to the problem. The project will seek to protect the freedom to be mobile, independent and socially-included for all groups regardless of their age and abilities.

2.2 Why is the NTC undertaking this project

The increased use of innovative vehicles and motorised mobility devices has resulted partly from a demand by commuters for alternative forms of travel in response to increasing transport costs and commute times caused by congestion. It also reflects a growing recognition on enabling people of all ages and abilities with the freedom to remain mobile and retain their independence and connections with the community. However, the increasing use of innovative vehicles and motorised mobility devices affects other vulnerable road users as well as the device users themselves (Staysafe, 2014).

It is currently not legal to use the majority of innovative vehicles being sold on road and road-related areas. Unregulated uses of innovative vehicles could increase safety risks on roads and road-related areas. For example, reports from the US suggest that the rapid increase in the use of electric scooters has also resulted in an increase in scooter-related incidents (Holley, 2018).

Motorised mobility devices provide a range of benefits for older Australians as well as people with disabilities. These vehicles allow independent travel and are a way for people to access employment, essential services, recreation and maintain their social networks (RRATRC, 2018). The restrictions placed by the current framework severely limit the choice an individual has when attempting to select the right device to suit their needs.

Queensland is the only Australian jurisdiction to administer a registration scheme for motorised mobility devices. The registration scheme provides an insight into the prevalence and growth in the number of motorised mobility devices over recent years.

In 2002, there were a total of 5,894 motorised mobility devices registered in Queensland. A steady annual growth in motorised mobility device registrations has increased this number to 31,294 registrations in 2017. Motorised mobility devices use, however, is likely to be higher than this as motorised mobility devices used on private property (e.g. solely within the confines of a retirement village/ nursing home) are not required to be registered, so are not captured by these numbers (RRATRC, 2018).

With Queensland representing approximately 20 per cent of Australia's total population, we therefore estimate that there are currently more than 156,000 motorised mobility devices in

use nationally. With an ageing population and the rollout of the National Disability Insurance Scheme, this number is likely to increase significantly over the coming years (RRATRC, 2018).

Evidence reviewed to develop this issues paper suggests that increasingly people are looking for more convenient ways to travel in their daily lives. However, unregulated use of these devices and outdated legislation may result in potential risks to users and other road users.

2.3 What are innovative vehicles?

For the purposes of this project, innovative vehicles are characterised as a form of transport that differs from conventional vehicles such as cars, motorcycles and bicycles. Typically, these devices are small, portable and designed to carry one person. However, it is likely that the design and function of innovative vehicles will continue to evolve. Presently the only types of innovative vehicles that are provided for in the Australian Road Rules are motorised scooters.

The examples provided below are not exhaustive but provide a small sample of innovative vehicles that are available for purchase but are not legal to use on roads or road-related areas in Australian states and territories.

Evolve - Electric skateboard

Onewheel

Segway Drift W1 e-Skates

YikeBike

Benefits of innovative vehicles

The public and community benefits of innovative vehicles include:

- increased independence and social inclusion
- an alternative to the motor vehicle for greater mobility choice
- environmental benefits such as reduced pollution, greenhouse gas emissions, reduced noise, and reduced use of resources

- direct cost savings to users because of reduced spending on petrol, tolls and vehicle maintenance and reduced capital costs such as vehicles and garaging, compared with motor vehicles, and
- health and fitness benefits from the physical exercise associated with some types of innovative vehicles.

Question

1. What characteristics need to be considered when defining what an innovative vehicle is?

2.4 What are motorised mobility devices?

The Australian Road Rules define a wheelchair as a chair mounted on two or more wheels that is built to transport a person who is unable to walk or has difficulty in walking, but does not include a pram, stroller or trolley (ARR, 2018). This definition captures both motorised wheelchairs and mobility scooters which are the two main categories of motorised mobility devices currently available for sale in Australia.

Wheelchairs

Motorised wheelchairs are generally designed to carry people with greater mobility needs than users of mobility scooters. They are, for the most part, controlled by a hand-controlled joystick (although other methods of control exist, such as head or mouth controls). Motorised wheelchair users commonly require assistance getting into/out of the wheelchair.

A sub-category of the wheelchair is the 'powerchair' characterised by an upright seating position, smaller wheel radius and the lack of push bars (for a carer to control the chair by pushing from the rear). The terms 'powerchair' and 'motorised wheelchair' are often used interchangeably in promoting mobility products.

As a specialised and often specifically-tailored device, a motorised wheelchair is often required to be prescribed and fitted by medical practitioners (Staysafe, 2014).

The separation between wheelchair and mobility scooter becomes less clear when comparing some models of mobility scooters and electric wheelchairs, as they can have very similar functions, dimensions and operating characteristics.

Pride Mobility – Motorised wheelchair

Pride Mobility – Powerchair

Mobility scooters

Although not specifically defined in the ARRs, mobility scooters share the same classification as motorised wheelchairs in that they are both classified as either pedestrians or vehicles.

- A person driving a motorised wheelchair that cannot travel at over 10 km/h (on level ground) is considered a 'pedestrian'.
- A motorised wheelchair that can travel at over 10 km/h (on level ground) is considered a 'vehicle'.

There is general agreement that mobility scooters are often used by older people, or by people who have a permanent or long-term physical limitation but have sufficient mobility to walk short distances (within their own home environment) (RRATRC, 2018), and are safe to step onto and off the scooter unaided (Staysafe, 2014).

Pride Mobility – 3-wheel scooter

Pride Mobility – 4-wheel scooter

Benefits of motorised mobility scooters

The benefits of motorised mobility devices are many and diverse. The use of these devices by people with limited physical mobility has the potential for significant improvements in mental health outcomes, as people can travel on demand in their community, combat social isolation and reduce their reliance on formal or informal carers.

These devices contribute significantly to the level of independence people with disabilities can access, enabling people to do their own grocery shopping and attend medical appointments without the need for community transport. These devices can further enable people to self-regulate driving their registered motor vehicle, reducing their use of, and reliance on, it (Staysafe, 2014).

Question

2. What differences between motorised wheelchairs and mobility scooters need to be recognised by this project?

2.5 Current regulatory framework

Current legislation affecting the use of innovative vehicles and motorised mobility devices includes:

- the Motor Vehicle Standards Act 1989
- the Australian Light Vehicle Standards Rules 2015, and
- the Australian Road Rules.

2.5.1 The Motor Vehicle Standards Act 1989

The Motor Vehicle Standards Act 1989 (the Act) requires that all road vehicles intended for use on public roads must meet the national standards covering safety and emissions requirements known as the Australian Design Rules (ADRs) when they are being supplied to the Australian market for the first time in limited circumstances a vehicle is not required to comply with the ADRs. This is explored in more detail in section 3.2 of this paper.

The Act defines a road vehicle as:

- A road motor vehicle, that is a vehicle designed solely or principally for the transportation of people, animals or goods on public roads or a vehicle permitted to be used on public roads, or
- A road trailer, that is a vehicle without motive power designed for attachment to a road motor vehicle or a piece of machinery or equipment that is equipped with wheels and designed to be towed behind a road motor vehicle, or
- A partly completed motor vehicle (MVSA, 1989).

2.5.2 The Road Vehicle Standards Act 2018

The Road Vehicle Standards Act 2018 (RVSA) will replace the Motor Vehicle Standards Act 1989 (the Act) as the Australian Government's primary legislation for regulating road vehicles. The RVSA will deliver modernised legislation to increase community safety and remove unnecessary process for business.

On 28 November 2018 the Road Vehicle Standards Bills passed through Parliament. The Bills subsequently received Royal Assent on 10 December 2018. The main provisions will come into effect on 11 December 2019. This date also marks the commencement of a 12-month transitional period during which the operation of the Act is preserved to allow all affected parties time to adapt to the new legislative arrangements. At the end of the 12-month transitional period compliance with the RVSA will be mandatory.

For the most part the devices and vehicles discussed in the paper will not be affected by the introduction of the RVSA (DIRDAC, 2018).

2.5.3 The Australian Light Vehicle Standards Rules 2015

As previously discussed the Motor Vehicle Standards Act 1989 (the Act) requires compliance with the ADRs for road vehicles that are being supplied for the first time to the Australian market. The Australian Light Vehicle Standards Rules 2015 (ALVSRs) ensure continued compliance with all applicable ADRs from the moment a vehicle is driven on a public road for the first time.

The ALVSRs are part of a national law scheme to provide uniform vehicle standards for in-service vehicles throughout Australia. As national scheme legislation, the ALVSRs require ongoing monitoring and review to ensure they remain contemporary and fulfil the needs of Australian society. The ALVSRs are a model law maintained by the NTC that have no legal effect in and of themselves; instead they form the basis of the vehicle standards for in-service vehicles for each Australian state and territory.

The ALVSRs are applicable to vehicles with a Gross Vehicle Mass of 4.5 tonnes or less, except in the limited circumstances detailed below:

The light vehicle standards do not apply to:

- a vehicle propelled by a motor with a maximum power output of not over 200 watts; or

- a power-assisted pedal cycle within the meaning of vehicle standards determined under the Motor Vehicle Standards Act, as amended from time to time; or
- a motorised wheelchair that cannot travel at over 10 km/h.

How this works in practice

For a vehicle to be able to be supplied to the Australian market it must comply with all the relevant ADRs in accordance with the Act.

Once the vehicle has been supplied and is driven for the first time on a public road, it becomes an in-service vehicle and is no longer required to comply with the ADRs. The ALVSRs require continued compliance with all applicable ADRs for all in-service vehicles for the purposes of promoting their safe use and efficiency on public roads (ALVSR, 2015).

2.5.4 The Australian Road Rules

The Australian Road Rules (ARRs) provide rules to be followed by all road users including motorists, motorcyclists, cyclists and pedestrians. Like the ALVSRs, the ARRs are a national scheme legislation and as such they require ongoing monitoring and review to ensure they remain contemporary and fulfil the needs of Australian society (ARR, 2018). The ARRs are model law maintained by the NTC that have no legal effect in and of themselves; instead they provide the basis for road rules for each Australian state and territory.

The ARRs provide the rules for the safe use of vehicles that are required to comply the ADRs and the ALVSRs on roads and road-related areas. They also provide for the use of vehicles and devices on roads and road-related areas that are not subject to registration and licensing requirements in most jurisdictions, this is explored in more detail in section 3.2 and section 4 of this paper.

2.6 Queensland regulation of personal mobility devices

In December 2018 the Queensland Government updated the rules for the use of personal mobility devices. It is now permitted to use an innovative vehicle in Queensland in public spaces and road-related areas provided they meet the following requirements:

- be designed for use by a single person only
- comply with specific dimensional requirements
- have a maximum speed of 25 km/h
- have a maximum unladen weight of 60 kg
- be powered by an electric motor
- have a breaking system, and
- have no sharp protrusions.

Prior to this update the rules for the use of personal mobility devices in Queensland were focused on Segway-type devices (QLD Government, 2018).

2.7 International regulation of innovative vehicles and motorised mobility devices

The NTC has prepared the following examples of the different international approaches to regulating personal electric transport and mobility devices from publicly available literature.

While not exhaustive, the list of examples highlights how innovative vehicles and motorised mobility devices are regulated internationally.

2.7.1 Innovative vehicles

Europe

In Paris, Segways or electric scooters can be ridden on footpaths and bicycle paths. The devices are treated as pedestrians and the same road rules apply. They cannot be ridden on public roads, except in shared zones (RACV, 2016).

The use of hoverboards (self-balancing scooters) and Segways on public roads, footpaths and nature strips in the United Kingdom is considered illegal. They can only be used on private land with prior consent from the landowner.

The legislation in the UK is like that in Australia, specifying that these devices do not meet the standards required for motor vehicles (and therefore cannot be registered), but cannot be classified as wheeled recreational devices due to their speed and power (Department for Transport, 2015).

United States

Although the use of hoverboards is legal in California, several restrictions apply. They are restricted to lower speed roads (56 km/h or less) or bicycle lanes. Use is limited to riders aged 16 years and above. However, the legislation does not address the use of hoverboards on the footpath (RACV, 2016).

The use of hoverboards on public roads, footpaths and nature strips within New York City is considered illegal. Under the legislation, hoverboards are considered motor vehicles which cannot be registered or insured (New York Senate, n.d.)

Singapore

The Active Mobility Act 2017 describes a personal mobility device as a wheeled vehicle built to transport people only, propelled by an electric motor, human power or both, and includes a skateboard, but does not include a bicycle, power-assisted bicycle, motor car, wheelchair (motorised or otherwise) or mobility scooter. Personal mobility devices must not be used on roads (Active Mobility Act, 2017).

Personal mobility devices must not weigh more than 20 kg, have a maximum width of 70 cm, and should have a maximum capped speed of 25 km/h before they can be used on public paths (LTA, 2018).

On 7 March 2018, the Government announced it would require the registration of electric scooters used on public paths. This is a result of the rising number of accidents involving electric scooters on public paths due to inconsiderate and reckless actions of some electric scooter riders (LTA, 2018).

2.7.2 Motorised mobility devices

European standard

The European standard *electrically-powered wheelchairs, scooters and their chargers – requirements and test methods*, sets a 15 km/h speed limit with a slow switch to 6 km/h for high pedestrian areas. The standard does not impose any weight restrictions (ATSA, 2018).

California

The California Motor Vehicle Code allows mobility devices such as mobility scooters and electric wheelchairs to operate on sidewalks and bike paths, so long as pedestrians are given the right-of-way and they are operated in a safe manner (Chase, n.d.).

There is no set speed limit for the operation of mobility devices. The driver must use common sense and good judgment to remain safe and avoid a ticket. What may be a safe

speed on a slow afternoon under dry conditions may not be a safe speed the very next day during a busy lunch rush while it is raining (Chase, n.d.).

Singapore

Motorised wheelchairs and mobility scooters are classified as Personal Mobility Aids. They can be driven on footpaths and cycling paths. They must not be driven on roads. Crossing the road at zebra crossings or pedestrian traffic light crossings is permitted. It is not permitted to drive alongside cars on the road, or against the flow of traffic on the road.

From early 2019, the speed limit for the use of *motorised personal mobility aids* (such as motorised wheelchairs and mobility scooters) on all paths (i.e. pedestrian-only paths, footpaths and shared paths) will be reduced from 15 km/h to 10 km/h.

There are no design criteria for personal mobility aids as it is thought that these devices may require a specific design depending on the needs of the user. In addition, these devices have a low maximum speed of between 6 km/h and 10 km/h (Mobility Scooters at Singapore, 2016).

2.8 Previous research undertaken on innovative vehicles and motorised mobility devices

Over the past decade, several Australian governments, their agencies and academic institutions have reviewed the use of personal electric transport devices and motorised mobility devices to better understand how these devices operate and what is required to improve safety.

2.8.1 The Australian Competition and Consumer Commission

The Australian Competition and Consumer Commission (ACCC) is Australia's primary competition and consumer protection agency responsible for administering and enforcing the Competition and Consumer Act 2010, which includes the Australian Consumer Law (ACL).

From 2009–2013, the ACCC undertook work around motorised mobility devices to better understand the safety issues and provide improved safety information on the use of these devices. The ACCC was the lead agency for a reference group established to identify the safety issues, and actions to address safety concerns associated with motorised mobility devices. The reference group had three main functions: development of a national survey; reviewing laws; and providing advice on technical and standards development issues.

Key outputs from this work

- a targeted study of injury and fatality data, and community perceptions involving motorised mobility devices
- a national survey of motorised mobility device users designed to provide a better understanding of patterns of use, and
- the development of a publication designed to provide general safety guidelines to motorised mobility devices users (RRATRC, 2018).

Injury data

The ACCC commissioned the Monash University Accident Research Centre (MUARC) to better understand the risks and safety implications of motorised mobility devices from the perspective of a consumer product safety regulator. This work investigated serious injuries and fatalities associated with the use of these devices, as well as community perceptions. The report was published in 2011.

Key findings from the work

- There were 442 motorised mobility devices fall injury hospitalisations in Australia over the two-year period July 2006 to June 2008.
- Due to increasing use of motorised mobility devices, in Victoria alone, hospitalisations related to the use of these devices may grow by approximately 250 per cent over the next decade.
- 62 fatalities were identified that related to motorised mobility devices from July 2000 to August 2010.
- Most deaths related to motorised mobility devices were the result of collisions with a motor vehicle and the most common cause of death was a head injury.
- Community concerns around assessments and suitability of device use; difficulties selecting appropriate device given the wide variety in design; and the impact of the physical environment on safe use (e.g. maintenance of footpaths, road safety) (RRATRC, 2018).

National survey

In 2012 the ACCC, along with various stakeholders, undertook a national survey of motorised mobility devices users. The aim of this work was to further develop the work undertaken by MUARC, and to gain a better understanding of the demographics and patterns of use of motorised mobility devices users in Australia.

Key findings from the survey

- Over half (51 per cent) of motorised mobility devices users were aged 60 years or less, which is inconsistent with the perception of these devices only being used by older people.
- Very few motorised mobility devices users receive safety training or advice.
- At the time of purchasing, only about half (51 per cent) of motorised mobility devices users sought advice or assessment from specialists.
- A quarter (25 per cent) had safety training with their current device.
- Occupational therapists, other health professionals, and retailers such as sales persons and suppliers were the key providers of safety training and tuition (RRATRC, 2018).

2.8.2 Nationally-consistent approach to the use of motorised mobility devices

In 2012, Austroads initiated a project to develop a nationally-agreed framework for the safe interaction of motorised mobility devices with other road users (on road and road-related areas). The Austroads project aimed to improve both the construction and performance requirements for motorised mobility devices.

The objectives of the project were to:

- introduce improved construction and performance requirements for motorised mobility devices, so that they are less likely to result in unsafe outcomes when using footpaths and other public infrastructure
- encourage designs of motorised mobility devices that are more harmonious with infrastructure to minimise the consequences of user error or misjudgement
- address existing inadequacies in the Australian Road Rules related to motorised mobility devices
- make it easier to control the importation and sale of non-complying motorised mobility devices, and

- make it easier to identify devices that are suitable for conveyance on public transport (Austroads, 2018).

The project has resulted in the development of technical standards for motorised mobility devices. On 22 June 2018, the Technical Specification (AS TS3695.2.2018) *Requirements for designation of powered wheelchairs and mobility scooters for public transport and/ or road-related area use* was published. Copies of the technical specification are available to purchase through SAI Global.

The technical specification focuses on collision avoidance and sets out construction and performance requirements, such as:

- 170 kg maximum unladen mass for motorised mobility scooters
- no maximum laden mass for motorised wheelchairs
- a maximum laden mass of 300 kg for motorised mobility devices for a blue label
- 10 km/h maximum speed
- for devices capable of exceeding 6 km/h, a low speed switch that will restrict the speed of a device to 5 km/h (this functionality is common in many European devices), other requirements based on Australian and international standards such as stability on slopes, braking performance and electrical safety
- maximum dimensional limits, and
- optional requirements for public transport that display key advice characteristics including make, model, length, width, unladen mass, maximum safe slope, year of production and a unique identifier:
    - a blue or white permanently-affixed label that displays key device characteristics including make, model, length, width, unladen mass, maximum safe slope, year of production and a unique identifier; and
    - motorised mobility devices that meet the specifications for use on public infrastructure will be issued with a white label.
    - devices that are also likely suitable to access passenger transport will be issued with a blue label. The blue label specifications are based on the *Disability Standards for Accessible Public Transport* (Austroads, 2018).

Austroads also advised that successful adoption of the technical specification would:

- provide customers with better information at the point of sale (about the appropriateness of motorised mobility devices for their intended use)
- improve safety for users and other pedestrians (by improving the design of motorised mobility devices being used on public infrastructure), and
- assist users and passenger transport operators to better understand the devices likely to be suitable for conveyance on passenger transport (using the labelling scheme).

The increased maximum unladen mass for motorised scooters recognises the needs of larger and heavier people to be able to purchase a mobility aid that can support them. The 170 kg was determined having regard to the adult population; 85% weighing no more than 100 kg, meaning that the vast majority of users plus a load of 40 kg would remain under the 300 kg limit for a blue label (Austroads, 2018).

The removal of the maximum unladen mass for traditional motorised wheelchairs recognises that users of such devices have no alternative for mobility on public infrastructure (Austroads, 2018).

Any powered wheelchair, including motorised scooters accessing passenger transport conveyances, must not exceed a gross mass of 300 kg. The 300 kg weight limit is consistent with the requirements under the Disability Standards for Accessible Public Transport 2002 for ramps and lifts to support a minimum safe working load of 300 kg (Austroads, 2018).

The implementation of the technical standard is designed to improve the safety of motorised mobility devices. Specifically, the technical standard will require motorised mobility devices to demonstrate dynamic and static stability on slopes, limit the dimension of devices, introduce a slow speed switch for devices that can exceed 6 km/h, and ensure devices can negotiate uneven surfaces (Austroads, 2018).

2.8.3 NSW Parliament Inquiry – Report on non-registered motorised vehicles

On 14 November 2012, the NSW Standing Committee on Road Safety (Staysafe) resolved to undertake an inquiry into the increasing use of non-registered motor vehicles on public roads, footpaths and public land and their impact on road safety.

The Staysafe Committee's inquiry focused on:

- the current status of these vehicles under the road rules
- road safety problems associated with their use
- data collection on injury and deaths rates, and
- vehicle standards (including design, engine capacity, mass and speed controls).

The Staysafe Committee also assessed the availability of road safety education, the need for skills and competency training for vehicle users, and the insurance implications of injuries and deaths related to their vehicle use (Staysafe, 2014).

The Staysafe Committee's report was tabled in the NSW Parliament in March 2014. The report acknowledged that the trend toward alternative modes of transport had obvious benefits "*for groups in the community who for reasons of age or infirmity would otherwise be house bound*" (Staysafe, 2014).

A consistent theme running through the inquiry was the lack of data concerning the use of non-registered motorised vehicles and their involvement in accidents. The report noted that the problems associated with lack of data are compounded by the current vehicle coding system, which does not allow precise differentiation between vehicle classes (Staysafe, 2014).

Under the current system, some registered vehicles used on public roads (such as mopeds) are included with non-registered vehicles (including electric bicycles and quad bikes). It was also noted that the classification of mobility scooter users as pedestrians created another layer of confusion (Staysafe, 2014).

The Staysafe Committee recommended that an interagency working group investigate ways to improve data collection and research on injuries and deaths caused by non-registered motorised vehicles, as well as relevant risk factors (Staysafe, 2014).

The NSW Government response to the report, which was tabled in September 2014, indicated its support for several of the recommendations, including:

- improved data collection and research on injuries and deaths caused by non-registered motor vehicles, as well as relevant risk factors
- improved data collection and improvements to coding for non-registered motorised vehicles involved in road accidents
- work to improve the coding of 'Admitted Patient Data' to differentiate between vehicle types

- the work being undertaken by Austroads (and other Australian jurisdictions) toward standard Australian Design Rule classification for non-registered motor vehicles, and
- a public campaign to inform the community of the risk of injury associated with the use of non-registered motorised vehicles and of the need for appropriate insurance to cover potential liability (Staysafe, 2014).

2.8.4 Senate Inquiry: Rural and Regional Affairs and Transport References Committee – Need for regulation of mobility scooters, also known as motorised wheelchairs

An inquiry into the need for the regulation of mobility scooters, also known as motorised wheelchairs, was conducted with a final report published on 20 September 2018.

The inquiry focused on the following matters:

- the number of deaths and injuries attributed to accidents involving mobility scooters in Australia since their introduction
- the causes of these accidents
- any current regulations governing the use of mobility scooters throughout Australia
- comparison of Australian regulations with international standards
- what support structures are in place to ensure the safe operation of mobility scooters, and
- the regulatory role of government and non-government bodies; and any related matter (RRATRC, 2018).

Key issues arising from the inquiry

- The importance of having an appropriate regulatory framework, which supports individual independence, but at the same time encourages safety on roads, footpaths, in shopping centres, on public transport and around recreational facilities.
- Speed of mobility devices is a key concern. While several submitters pointed to the dangers of increasing the permitted speed limit, a large number raised strong objection to the introduction of any regulations which would decrease the permitted maximum speed from 10 km/h.
- The current weight limits set for mobility devices – particularly motorised wheelchairs – is not practical (The Rural and Regional Affairs and Transport References Committee, 2018).

Recommendations

The inquiry delivered the following recommendations:

1. That the Australian Government ensure that Austroads has adequate funding to undertake research and consultation activities to inform the establishment of a nationally-consistent regulatory framework for motorised mobility devices.
2. That Austroads take into account this report, and the evidence provided to the inquiry, for the purpose of establishing a nationally-consistent regulatory framework for motorised mobility devices. As part of the deliberation, Austroads should consider simple and low-cost licensing and registration arrangements and third-party insurance.

3 Analysis of issues – Innovative vehicles

Key points

The National Transport Commission (NTC) has identified the following areas to be considered as part of the investigation into regulatory barriers to the safe use of innovative vehicles:

- Risk of conflict between different road users due to the increased use of innovative vehicles.
- The use of innovative vehicles is illegal in most jurisdictions.
- A lack of national consistency could create confusion for industry and community.
- Limited understanding of the safety risks associated with innovative vehicle use.

3.1 Risk of conflict between different road users due to the increased use of innovative vehicles

A wide variety of new innovative vehicles have entered the market in recent years, and their increasing use may raise the likelihood of a conflict with other road users. Ranging from Segways to electric scooters, skateboards and newer types such as the YikeBike. These devices are legal to import and own in Australia. Examples of innovative vehicles are provided in section 2.1 of this paper.

Users are looking for convenient ways to get around in their daily lives and these devices could provide a solution to the first and last mile problem (Dowling et al., 2015). However, uncontrolled use of these devices may result in potential risks to innovative vehicle users and other road users. While there is currently limited data available for how personal electric transport devices are being used, the significant speed differential with pedestrians could result in an increased risk of a significant collision on footpaths.

The National Transport Commission (NTC) is not aware of the availability of any consolidated data on the use of innovative vehicles in Australia. However, while the market for personal electric transport devices currently could be limited, there is a possibility that it could expand once more people start considering their potential as a transportation alternative for short range travel. This has the potential to create conflicts with other road users and increase safety risks as users are not provided with any guidance in the road rules about their safe use.

Electric scooter sharing services

Start-up companies such as Bird and Lime are providing their dockless electric scooter sharing services in several US cities and have started expanding into Europe in recent months (Ghosh, 2018). Ride-hailing companies such as Uber (Uber, n.d.) and Taxify are also entering this market (Clark, 2018).

The rapid increase in the use of electric scooters and conflicts with other road users has also resulted in an increase in scooter-related injuries (Holley, 2018). Reports from the US suggest that since the increase in popularity of electric scooters generally, there has been a subsequent rise in related incidents and hospital admissions (Ehrenkranz, 2018).

A fatality in September 2018 occurred in Washington DC involving a 20-year-old electric scooter rider colliding with a Sport Utility Vehicle. The rider was dragged approximately 20 metres, and subsequently pinned under the vehicle (Associated Press, 2018).

Despite the safety and regulatory hurdles on a city-by-city basis, electric scooter companies and their respective services are continuing to make their way to markets all over the world (TechCrunch, n.d.). Lime has also commenced scooter trials in Christchurch and Auckland. About 35,000 people in Christchurch – one in ten residents – have taken at least one ride on a Lime scooter since 400 were launched in the city in October 2018. There are now 700 Lime scooters in Christchurch and up to 1,000 in Auckland (Law, 2018).

Lime has also started trialling electric scooters at Monash University in Melbourne's Caulfield campus to explore sustainable transport. Lime's 'come and try' tents will provide students and staff the opportunity to test out the electronic scooters and provide their feedback. The trial will continue following these 'come and try' tents, with the scooters remaining available for use on campus until mid-December 2018. The scooters will be located at central campus areas (Monash University, n.d.).

At present, any company that wishes to trial dockless electric scooters in Australia would need an exemption from the relevant state or territory road authority if the scooter has more than a maximum power output of 200 watts and is capable of a maximum speed greater than 10 km/h. Some Australian jurisdictions will require an exemption for the use of any electric scooter regardless of the power output or speed that they are capable of, as they have banned the use of all electric scooters. Lime has recently sought an exemption to operate a dockless scooter trial in Brisbane (Caldwell, 2018).

The Australian Capital Territory, New South Wales and South Australian prohibit the use of all motorised scooters on roads and road-related areas.

The Northern Territory, Tasmania, Victoria and Western Australia allow the use of motorised scooters on roads and road-related areas, provided they do not have a maximum power output of more than 200 watts and are not capable of exceeding 10 km/h on level ground. In these jurisdictions the use of motorised scooters is prohibited on:

- a road with a dividing line or median strip
- a road with a speed limit greater than 50 km/h
- a one-way road with more than one marked lane, and
- a road at night.

As discussed in section 2.6, Queensland provides for the use of many different types of innovative vehicles including motorised scooters.

Electric-assist bicycle sharing service trials

Lime launched in March 2017 in the United States and has since expanded in over 30 overseas markets. The company is now the largest dockless bike-share operator in the US with approximately 10,000 bikes on the street and 250,000 users (Farnsworth, 2017).

Dockless electric-assist bikes have recently arrived in Sydney, with Lime distributing 300 bikes within the city centre. The bikes contain a lithium battery, which is replaced every two days by operational staff, and allows users to ride at speeds up to 23.8 km/h. A local team of 50 operations specialists and mechanics has been employed in Sydney to respond to all customer enquiries (Bennett, 2018).

Local manufacturing of innovative vehicles in Australia

Innovative vehicles are legal to manufacture, import and own in Australia. Shops selling a wide variety of devices already exist in Australia. There are also local manufacturers selling their devices to the local and foreign markets.

Evolve Skateboards is an Australian company that sells designer electric skateboards in 30 countries (Advanced Queensland, 2018). In 2016, the company was named the winner of the Queensland Export Award and it has been named in the BRW Fast 100 list for the past

three years (Consulting Hall, 2018). In 2016, the company turned over $14 million (Smart Company, 2017), and in July 2018 Evolve was named the winner of the Manufacturing category for the Gold Coast Business Excellence Awards (Consulting Hall, 2018).

Question

3. What uses of innovative vehicles need to be considered as part of this investigation?

3.2 The use of innovative vehicles is illegal in most jurisdictions

The current regulatory framework does not support the legal use of innovative vehicles on roads and road-related areas.

Vehicle classifications in the Motor Vehicle Standards Act 1989

If a vehicle is intended for use on a public road then it must comply with all applicable Australian Design Rules (ADRs) as required by the Motor Vehicle Standards Act 1989 (the Act) when it is supplied to the Australian market for the first time for the intended use of being operated on public roads.

The Act defines a road vehicle as:

- A road motor vehicle, that is a vehicle designed solely or principally for the transportation of people, animals or goods on public roads or a vehicle permitted to be used on public roads; or
- A road trailer, that is a vehicle without motive power designed for attachment to a road motor vehicle or a piece of machinery or equipment that is equipped with wheels and designed to be towed behind a road motor vehicle; or
- A partly completed motor vehicle (MVSA, 1989).

A vehicle that is intended for use on private property or pathways is not required to comply with the ADRs at any point.

Circumstances in which a vehicle is not required to comply with the ADRs

In limited circumstances a vehicle that is designed for use on pathways and public roads is not required to comply with the ADRs.

The Motor Vehicle Standards (Road Vehicles) Determination 2017 (the determination) made under the Act 1989 determines that vehicles such as motorised recreational devices, motorised scooters and motorised wheelchairs are not road vehicles for the purposes of the Act. This means that these vehicles can be supplied for use on public roads without needing to comply with the ADRs. Inclusion in the determination of vehicle classes does not indicate permission for use. State and territory governments regulate in-service vehicle use and, as such, vehicle users will need to familiarise themselves with local requirements.

The determination affords road authorities in each state and territory the ability to allow vehicles determined to not be road vehicles to be used on public roads. In the event a road authority permits the use of a vehicle on a public road that is not included in the determination, the Department of Transport and Infrastructure, Regional Development and Cities (DIRDAC, 2018) could then regard the vehicle as a road motor vehicle that does not comply with the applicable ADRs, which could make importation of that particular vehicle illegal (Department of Transport and Main Roads, 2013). **Table 1** overleaf sets out examples of vehicle classes that are not vehicles for the purposes of the Act.

The determination is not exclusive. That is, while it identifies vehicle classes not subject to the Act, any other vehicle or vehicle class can continue to be assessed on its own merits on an administrative basis (Motor Vehicle Standards Determination, 2017). An example of this is Segways and Segway-type devices. Six Australian jurisdictions provide for their limited use, this is discussed further in section 3.3 of this paper.

Table 1. Innovative vehicles that are not road vehicles for the purposes of the Motor Vehicle Standards Act 1989

Motorised recreational devices: a wheeled device that is built to transport a person and is ordinarily use for recreation or play, is assisted by a motor or motors having a combined maximum power output not exceeding 200 watts, and includes motor-assisted rollerblades, roller skates, skateboards, unicycles and other similar wheeled devices.	
Motorised scooters: a motorised vehicle that: (a) is designed to be used by a single person; (b) has two or more wheels and a footboard supported by the wheels; (c) is steered by handlebars; and (d) is propelled by a motor or motors having a combined maximum power output not exceeding 200 watts.	
Power-assisted pedal cycles: (a) a two-wheeled or three-wheeled pedal cycle to which is attached one or more auxiliary propulsion electric motors having a combined maximum power output not exceeding 200 watts; or (b) a vehicle meeting European Committee for Standardization. EN 15194:2009 or EN 15194:2009+A1:2011 Cycles – Electrically power assisted cycles – EPAC Bicycles; But does not include a vehicle that has an internal combustion engine.	

Table 1 above provides that a Motorised Wheeled Recreational Device and Motorised Scooters can be supplied for intended use on public roads provided that the devices do not exceed a maximum power output of more than 200 watts.

This means that road authorities in each jurisdiction can provide for their use on paths public roads without the risk of DIRDAC making the importation of these devices illegal.

Although this is a step in the right direction, the major limiting factor is the restriction of the maximum power output to 200 watts as the majority of innovative vehicles available today exceed the 200-watt power limitation.

Vehicle classifications in the Australian Road Rules

The Australian Road Rules (ARRs) are the mechanism that provide rules for the safe use of innovative vehicles and motorised mobility devices. The vehicle definitions listed in **Table 2**

summarise the most common forms of transport in the ARRs that do not require, for the most part, a driver licence or registration to be operated in Australian states and territories.

Where the Motor Vehicle Standards Act 1989 (the Act) requires that a vehicle that is being supplied to the Australian market for the first time must comply with particular standards, the ARRs provide rules to be followed by all road and road-related area users including motorists, motorcyclists, cyclists and pedestrians.

The ARRs also provide for the use of vehicles and devices that are not subject to the requirements of the Act, either because they have been determined to not be road vehicles for the purposes of the Act, or that they clearly do not fall within the scope of the definition of a road vehicle.

Although the determination, as discussed previously, provides for the supply of motorised recreational devices intended for use on public roads, the ARRs has not adopted this category. This means that it is legal to sell motorised recreational devices intended for use on public roads, but they are not legal to use on public roads.

The only innovative vehicles provided for in the ARRs are motorised scooters as shown in **Table 2**. Both the ARRs and the determination are constant in that a motorised scooter must not have a power output exceeding 200 watts. The major difference is that the ARRs imposes a 10 km/h maximum speed capability where the determination does not.

Should the ARRs be amended to provide for the use of more innovative vehicles, the devices would only need to comply with the requirements set out in the determination if they will be used on public roads. If they are only intended to be used on pathways, then jurisdictions can allow the use of devices that exceed the 200-watt power limit set by the determination.

Queensland is the only jurisdiction the provides for the use of a motorised scooter that has a maximum power output greater than 200 watts as discussed in section 2.6 (QLD Government, 2018).

Table 2. Australian Road Rules definitions

Bicycle: a vehicle with 2 or more wheels that is built to be propelled by human power through a belt, chain or gears (whether or not it has an auxiliary motor), and: (a) includes a pedicab, penny-farthing and tricycle; and (b) includes a power-assisted pedal cycle within the meaning of vehicle standards determined under the Motor Vehicle Standards Act 1989 of the Commonwealth, as amended from time to time; but (c) does not include a wheelchair, wheeled recreational device, wheeled toy, or any vehicle (other than a vehicle referred to in paragraph (b)) with an auxiliary motor capable of generating a power output over 200 watts (whether or not the motor is operating).	

Motorised scooter: a scooter that is propelled by 1 or more electric motors with a maximum power output not more than 200 watts; and a maximum speed not exceeding 10 km/h on level ground.	
Wheelchair: a chair mounted on 2 or more wheels that is built to transport a person who is unable to walk or has difficulty in walking, but does not include a pram, stroller or trolley.	
Wheeled recreational device: a wheeled device, built to transport a person, propelled by human power or gravity, and ordinarily used for recreation or play, and: (a) includes rollerblades, rollerskates, a skateboard, scooter, unicycle or similar wheeled device; but (b) does not include a golf buggy, pram, stroller or trolley, a motor-assisted device other than a motorised scooter (whether or not the motor is operating), or a bicycle, wheelchair or wheeled toy.	
Wheeled toy: a child's pedal car, scooter (other than a motorised scooter) or tricycle or a similar toy, but only when it is being used only by a child who is under 12 years old.	

Question

4. What key factors need to be considered when determining safe rules of operation for innovative vehicles on roads and road-related areas?

3.3 A lack of national consistency could create confusion

There is a current lack of a nationally-harmonised approach to regulating innovative vehicles to enable the safe operation of these devices between Australian jurisdictions. A consistent approach could ensure the rules governing the use of these vehicles are evidence-based and seamless across borders. This will provide clarity for both the community and industry as to the types of innovative vehicles that can be used and how they can be used.

Using Segways as an example, six states allow the use of these devices that are not covered under the ARRs. The following provides examples of the different approaches taken by jurisdictional road authorities to regulate Segways.

Segway

Australian Capital Territory

The Australian Capital Territory allows a Segway to be used on footpaths, shared paths and nature strips. On-road use is allowed only when there is no footpath, shared path or nature strip, or it is impracticable to travel along a footpath, shared path or nature strip (ACT Government, 2017).

Queensland

In Queensland a Segway is known as a personal mobility device which can be used on road-related areas such as paths and nature strips. A personal mobility device must not be used to travel along a road unless it is impractical not to, or if there is an obstruction on the path or nature strip – in these cases you are permitted to travel up to 50 metres on the road (Qld Government, 2015).

South Australia

In South Australia a Segway is known as an electric personal transporter. The use of these vehicles is only permitted if approved by the Minister. Approval is given to an operator, rather than the driver of the vehicle, and the approval applies to a particular area (Road Traffic Regulations, 2014).

Tasmania

Tasmania only permits the use of Segways, also known as motorised self-balancing boards, in designated areas as part of a commercial tour operation. It is illegal to use a Segway on a public street except as part of a commercial tour where the Department of State Growth has issued a short-term unregistered vehicle permit to the commercial tour operator (Tas Government, n.d.).

Victoria

Victoria only permits the use of Segways, also known as electric personal transporters, in designated areas as part of a commercial tour operation. In Victoria, the Roads Corporation may specify roads and road-related areas as an electric personal transporter route and may specify an area encompassing roads and road-related areas as an electric personal transporter area by notice published in the Government Gazette. It is an offence to travel on the vehicle on a road or road-related area that is not part of an electric personal transporter route or an electric personal transporter area. It is also an offence to travel on the vehicle on a road or road-related area except as part of an electric personal transporter tour (Road Safety Rules, 2017).

Western Australia

Western Australia only permits the use of Segways, also known as electric personal transporters, in designated areas as part of a commercial tour operation. In Western Australia, the Minister may declare an area to be an electric personal transporter area by notice published in the Government Gazette. It is an offence to ride the vehicle other than in an electric personal transporter area. It is also an offence to ride the vehicle except as part of a commercial tour operation (Road Traffic Code, 2000).

New South Wales

New South Wales does not allow the use of these types of devices anywhere except on private property as they are classified as a motor vehicle that does not meet the national standards set under the Motor Vehicle Standards Act 1989.

Question

5. What are the practical and measurable outcomes required from a nationally-consistent policy and regulatory framework for innovative vehicles?

3.4 Limited understanding of the safety risks associated with innovative vehicles

There is currently limited data available regarding the safety risks associated with innovative vehicle use. According to the previous work undertaken by the Joint Standing Committee (Staysafe) on Road Safety, accident statistics involving non-registered motorised vehicles are under-reported. Despite this, the number of crashes is very low compared with other vehicles, cyclists and pedestrians (Staysafe, 2014).

A consistent theme running through the Staysafe inquiry was the lack of data concerning the use of non-registered motorised vehicles and their crash involvement. This message was reinforced by evidence from inquiry participants, who overwhelmingly stressed that data collection for crashes involving non-motorised registered vehicles is inadequate, and that improvements are needed to better inform policy development (Staysafe, 2014).

The data problem is compounded by the current vehicle coding system, which does not enable precise differentiation between vehicle classes. This means that some registered vehicles generally used on public roads (such as mopeds) are included along with non-registered vehicles (electric bicycles and quad bikes). Definitional issues related to the classification of mobility scooter riders as pedestrians create another layer of confusion.

While no national data on scooter injuries exists in the US, the press has reported an increase in scooter-related injuries following the emergence of popular electric scooter sharing services (Holley, 2018) referred to in section 3.1 of this paper. However, at this stage it is difficult to establish whether this increase in injury can be directly attributed to the devices' particular characteristics or if it is a result of increased use. It is also not clear

whether the quality of infrastructure available or other factors have played a significant role in these incidents.

The same lack of data affects our understanding of what a safe speed is for innovative vehicles. The NTC notes that currently available biomechanical data is predominantly focused on passenger vehicle crash safety which reflects the preference for a car dependent society. Consequently, there is a lack of evidence to understand the human tolerance to injury on impact with cyclists, innovative vehicles and motorised mobility devices.

Presently the Northern Territory, Tasmania, Victoria and Western Australia allow the use of motorised scooters, provided they are not capable of exceeding 10 km/h on level ground. Queensland has recently provided for the use of innovative vehicles capable of speeds up to 25 km/h.

The growth in demand for innovative vehicles now requires a greater understanding of energy management at low speeds on roads and road-related areas interacting with a diverse range of user types. Balancing the need between a practical speed and a safe speed will be a key factor in developing a regulatory framework that provides for the safe and legal use of innovative vehicles.

Question

6. What evidence-based distinctions between acceptable and unacceptable levels of risk associated with the use of innovative vehicles could be considered to inform the way innovative vehicles are regulated?

4 Analysis of issues – Motorised mobility devices

Key points

The National Transport Commission (NTC) has identified the following key issues to be addressed with regards to motorised mobility devices (MMDs):

- The Australian Road Rules (ARRs) do not provide for the legal use of many innovative vehicles that are available today.
- Current motorised mobility device classifications in the Australian Road Rules are not clear.
- Some motorised mobility devices may not be compatible with public spaces and transport infrastructure.
- Limited understanding of the safety risks associated with motorised mobility device use.

4.1 The Australian Road Rules do not provide for the legal use of many motorised mobility devices that are available today

The Australian Road Rules (ARRs) currently restrict the types of motorised mobility devices (MMDs) that people can access. This restricts the options available to people with temporary or permanent mobility limitations when assessing a device that suits their needs.

In accordance with ARR 288(3) a driver may drive a motorised wheelchair on a path if:

(a) the unladen mass of the wheelchair is not over 110 kg

(b) the wheelchair is not travelling over 10 km/h, and

(c) because of the driver's physical condition, the driver has a reasonable need to use a wheelchair (NTC, 2010).

Motorised mobility devices sold in Australia are predominantly supplied by overseas manufacturers who generally follow European standards. This could remove many powered mobility devices from the Australian market and impose significant hardship and cost on those who rely on the various options due to the European standards being far more relaxed than the current ARR requirements.

Mass limits in the Australian Road Rules

There appears to be no historical data to confirm why there is a 110 kg unladen mass limit for motorised wheelchairs for use on footpaths. This matter was not addressed in the original regulatory impact statement for the ARRs. However, it is believed the unladen mass limit was taken from state and territory rules that existed prior to the introduction of the ARRs (NTC, 2010).

The Australian Capital Territory, Queensland and Tasmania have increased the unladen mass to 150 kg with no reported difficulties (NTC, 2010). The European standard does not impose any weight restrictions (ATSA, 2018).

Speed restrictions in the Australian Road Rules

Like historical reasoning for mass limits, there is no historical reference for the 10 km/h speed restriction in relation to motorised wheelchairs. Anecdotal advice suggests

that the 10 km/h is equivalent to walking speed for persons on foot, and it was intended to restrict motorised wheelchairs to the same speed as persons on foot (NTC, 2010).

When considering any change in speed specifications, it should be noted that the current 10 km/h restriction does not take into account people running, cyclists (including motorised bicycles) or users of wheeled recreational devices or toy vehicles on footpaths, most of whom are capable of travelling over 10 km/h (NTC, 2010).

The European standard sets a 15 km/per/hour speed limit with a slow switch to 6 km/hr for high pedestrian areas (ATSA, 2018).

Impacts to users and manufacturers of motorised mobility devices from inconsistencies between Australian Road Rules and European standards

Maintaining the current weight and speed restrictions in the ARRs for motorised mobility devices that conflict with international standards, is placing the aged and disability sectors at a significant disadvantage with regards to motorised mobility devices choice. This is contrary to the United Nations Convention on the Rights of Persons with Disabilities and Optional Protocol Article 20, Personal mobility:

> State parties shall take effective measures to ensure personal mobility with that greatest possible independence for persons with disabilities, including by:
>
> a) Facilitating the personal mobility of persons with disabilities in the manner and at the time of their choice, and at an affordable cost.
>
> b) Facilitating access by persons with disabilities to quality mobility aids, devices, assistive technologies and forms of live assistance and intermediaries, including by making them available at an affordable cost (ATSA, 2018).

In its submission to a recent Senate Inquiry into the regulation of mobility scooters and motorised wheelchairs, Assistive Technology Suppliers Australasia (ATSA) indicated that various local motorised mobility devices manufacturers rely on exports to sustain their business. ATSA argued that if Australia continues to adopt different standards to the rest of the world, it could generate excessive cost due to the requirement to modify or manufacture different units, one for the international market and one for the small Australian market. The expectation is that manufacturers would need to recover their cost leading to a significant price increase for the local market (ATSA, 2018).

In addition, major motorised mobility devices suppliers have indicated that they would withdraw from the Australian market if Australia was to move further away from internationally recognised standards, as they would not build specific models for such a small market.

ATSA has been informed by a major Australian exporter of power wheelchairs that any lowering of powered mobility speed limits would have an extreme and tremendously detrimental effect on powered mobility supply in our country (ATSA, 2018). According to ATSA's submission:

> *'Some suppliers of low quantity specialised product would find the cost of doing business here too high and simply stop bringing in such items. The cost to engineer, and then produce small quantities of motors would be high and that is before EMC, crash and Australian standards testing requirements. These costs would force prices to an obscene level but also drastically reduce choice to the market when many suppliers simply pull out leaving many clients without the best equipment match for their needs. At present mutual international standards recognition helps ensure costs for compliance is spread across the globe not just Australia. As an Australian manufacturer we would drop a number of our product offerings in this country as a result of*

decreased speed requirements. This lack of choice would impact heavily on people with specific requirements as a result of their condition. This is not simply a choice like Ford or Holden but a choice like independence or existence' (ATSA, 2018).

Further, the Darebin Disability Advisory Committee's submission to the same inquiry observed that if the Commonwealth Government maintains the 110 kg weight limit, most power wheelchairs would become essentially illegal. Similarly, the NSW Council of Social Services' submission also argued that imposing speed and weight restrictions would place Australia out of step with international standards, drive up costs for Australian users and decrease their choice and control.

Question

7. What barriers and health or safety risks are associated with the use of a motorised mobility device that does not meet the needs of a user because of the current restrictions?

4.2 Current motorised mobility device classifications in the Australian Road Rules are not clear

Motorised mobility devices users can be classified as either a 'pedestrian' or a 'driver' of a vehicle, depending on the maximum speed the chair is capable of. ARRs 15 and 18 set the threshold for establishing this distinction.

Motorised wheelchair as a pedestrian

According to ARR 18, a motorised wheelchair which is not able to travel faster than 10 km/h on level ground is considered a pedestrian.

This means that users are subject to the general road rules applying to pedestrians, including rules which:

- require pedestrians to use the footpath or nature strip adjacent to a road where there is one which can be used safely, and not travel on the road in these circumstances
- prohibit pedestrians from causing a traffic hazard by moving into the path of a driver, and
- regulate the use of shared paths with bicycles.

If there is no footpath to travel along, a person driving a motorised wheelchair may be required to travel along a road complying with the conditions required in rule 238, including:

- keeping as far to the left or right side of the road as is practicable
- facing approaching traffic that is moving in the opposite direction as long as practicable, and
- not travelling on the road alongside more than 1 other pedestrian (or vehicle) travelling in the same direction, unless overtaking other pedestrians.

ARR 288 provides the conditions that need to be met for the driver of a motorised wheelchair to be allowed to drive on a path. If a person that is driving a motorised wheelchair is not able to travel faster than 10 km/h they are classified as a pedestrian for the purposes of the ARRs. It is not clear if they are required to also comply with ARR 288, which provides that the driver of a motorised wheelchair may drive on a path if:

(a) the unladen mass of the wheelchair is not over 110 kg

(b) the wheelchair is not travelling over 10 km/h, and

(c) because of the driver's physical condition, the driver has a reasonable need to use a wheelchair.

The definition of wheelchair in the ARRs states that the intended use of a wheelchair is for a person that is unable to walk or has difficulty in walking, this is consistent between ARR 18 and 288. What is not consistent is the additional restriction imposed by ARR 288 that the unladen mass of the wheelchair not be over 110 kg.

Motorised wheelchairs as vehicles

ARR 15 states that a motorised wheelchair that can travel faster than 10 km/h on level ground is considered a vehicle. This classification of a motorised wheelchair as a vehicle means that the person using the device is to be treated as a driver, who is subject to all the road rules applying to drivers of vehicles.

The driver of a vehicle is generally not able to drive on a path except in limited circumstances. ARR 288 allows the driver of a motorised wheelchair that is classified as a vehicle to be driven on a path if:

- the unladen mass of the wheelchair is not over 110 kg
- the wheelchair is not travelling over 10 km/h
- because of the driver's physical condition, the driver has reasonable need to use a wheelchair, and
- the driver gives way to all other road users (including pedestrians) and animals on the path.

As mentioned previously, if there is no footpath to travel along, a person driving a motorised wheelchair may need to travel along a road, ARR 238 only provides for motorised wheelchairs that are pedestrians to travel along a road. A person driving a motorised wheelchair classified as a vehicle travelling along a road is subject to all the road rules applicable to the driver of a vehicle applicable in that state and territory.

Different treatment in legislation for similar types of devices

Motorised wheelchair users need a clear understanding of these nuances in legislation to comply with the different requirements for legally operating their devices. However, many motorised mobility devices currently available for sale in Australia exceed the weight and/or speed limit established in the ARRs and are being used on pathways illegally, possibly without users being aware they are in contravention of the law.

Similarly, enforcement agencies are expected to visually distinguish what could be very similar devices to enforce the relevant road rules. This leaves room for error for both users and the police in applying the law.

There are several situations that could potentially lead to events of non-compliance with and not enforcing the relevant provisions in the ARRs, for example:

- According to Australian Road Rule 288(3), a person driving a motorised wheelchair with unladen mass not over 110 kg can travel on a footpath while a similar device weighing 112 kg is not allowed to do so.
- A motorised wheelchair that is classified as a vehicle must comply with ARR 297 requiring drivers to have proper control of a vehicle. A motorised wheelchair that is a pedestrian is not required to comply with ARR 297.
- A motorised wheelchair that is a pedestrian must comply with the requirements in ARR 238 (listed in the section discussing motorised wheelchairs as pedestrians above) relating to pedestrians travelling along a road. It is not clear whether those requirements apply to a motorised wheelchair classified as a vehicle.

Question

8. How do current classifications of drivers of wheelchairs as both ‘pedestrians’ and ‘vehicles’ in the Australian Road Rules create confusion?

4.3 Some motorised mobility devices may not be compatible with public spaces and transport infrastructure

It is suspected that the lack of guidelines and technical standards for motorised mobility devices means that, at the point of purchase, users of these devices may not know whether they will be able to access and travel on all the public infrastructure.

Public spaces and related infrastructure

The only regulatory requirements that a motorised mobility device must meet to be used on paths in Australia is that the maximum forward speed of the device must not exceed 10 km/h and not weigh more than 110 kg – 150 kg, depending on the jurisdiction the device is being operated in. Many motorised mobility devices currently sold in Australia exceed these weights and/or speed requirements. Further, there are currently no restrictions on width or length of these devices, or minimum performance requirements for their safe operation on slopes and uneven surfaces (Austroads, 2018).

Gradients are encountered by motorised mobility devices users in a number of common situations, such as footpaths and access ramps to buildings. In order to navigate these gradients, it is critical that motorised mobility devices have the ability to come to a complete stop and for users to safely perform functions such as repositioning the motorised mobility devices, adjusting the controls, or waiting for pedestrians to pass (Austroads, 2018).

Public transport

Similarly, it is not evident to persons wanting to purchase a motorised mobility device whether their device will be suitable and safe for use on public transport infrastructure. Issues relating to the access of passenger transport may arise when a device is too heavy to use passenger ramps (e.g. buses and ferries), too wide to access doorways, or too long or lacking manoeuvrability to access reduce spaces in a public transport vehicle. This risks injury to motorised mobility devices users, other commuters, passenger transport workers as well as damage to infrastructure (Austroads, 2018).

Addressing issues regarding access to public spaces and public transport could make our public infrastructure more inclusive and safer to all users. It could also ensure that persons with disabilities or limited mobility are able to purchase and use the devices that better suit their needs.

Question

9. Is there a need for construction and performance requirements for motorised mobility devices to ensure safe use on public transport infrastructure?

4.4 Limited understanding of the safety risks associated with motorised mobility device use

Information about motorised mobility devices regarding their use and safety is difficult to find. There is little basic information available about the numbers of mobility devices in use across the country or the way the devices are being used inside and outside the home.

While the ARRs provide rules for how motorised mobility devices are to be used on roads and road-related areas, there is not extensive evidence regarding the magnitude of safety concerns. Research about the safety of these devices and their compatibility with the urban environment is scarce. This lack of data has contributed to a reliance on anecdotal information for a Senate Inquiry into the need for regulating these devices, with the Senate's Rural and Regional Affairs and Transport References Committee recognising the need for gathering comprehensive evidence (RRATRC, 2018).

The limited information available results in uncertainty around the actual injury and death rates involving motorised mobility devices. Existing data sources, including hospital and police records, lack detail about the circumstances and risk factors associated with motorised mobility devices, and few research studies have been conducted in this area (Staysafe, 2014).

Given the lack of evidence in relation to the safety of motorised mobility devices, a large number of submissions to the Senate Inquiry agreed on the need for a systematic and sustained approach to data collection in this area. It was argued that new research is needed in relation to the design, safety performance, user experience and needs, the rates and causes of accidents, and injuries and deaths involving mobility devices. It was also argued that the areas of road design, and regulatory interventions to improve user safety and user-behavioural risk factors merit further research and analysis (RRATRC, 2018).

Question

10. What evidence is available on the road safety risks associated with motorised mobility devices that could be used to inform the way motorised mobility devices are regulated?

Glossary

Term	Definition
First and last mile problem	Term used in transportation planning to describe the movement of people between home and public transport and/or public transport and work.
Gross Vehicle Mass	Means the maximum loaded mass of the vehicle.
Model law	A national model law is intended to provide the basis for nationally-consistent legislation.
National Transport Commission	The NTC is a statutory agency that proposes nationally-consistent land transport reforms.
Ride-hailing	A door-to-door service that uses online-enabled platforms to connect between passengers and local drivers using their personal non-commercial vehicles.
Road	A road is an area that is open to or used by the public and is developed for, or has as one of its main uses, the driving or riding of motor vehicles.
Road-related area	A road-related area is any of the following: (a) an area that divides a road (b) a footpath or nature strip adjacent to a road (c) an area that is not a road and that is open to the public and designed for use by cyclists or animals (d) an area that is not a road and that is open to or used by the public for driving, riding or parking vehicles.
Start-up company	A newly-emerged business venture that aims to develop a viable business model to meet a market need or problem.
Transport and Infrastructure Council (the Council)	The Council comprises commonwealth, state, territory and New Zealand ministers who are responsible for transport and infrastructure. The Australian Local Government Association is also a Council member.
Unladen mass	The weight of a vehicle when it is not carrying any passengers, goods or other items.

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