e-Riders United Australia

https://www.facebook.com/groups/165631780805196/

12 December 2019

Attn: Tim Davern National Transport Commission Level 3, 600 Bourke Street MELBOURNE VIC 3000

Dear Mr Davern,

Please find below the **e-Riders United Australia's** submission to the National Transport Commission's publication *Barriers to the safe use of personal mobility devices - consultation RIS.*

e-Riders United Australia represents 430+ riders of Personal Mobility Devices (PMDs). These riders are located around Australia and operate a range of PMDs - predominantly electric longboards, Onewheels, electric scooters and electric unicycles. Many members are part of larger state-based groups (1000+ members each) who promote the safe operation of PMDs among the growing community of PMD riders (see list at the end of this submission).

When not riding, operators of privately owned PMDs are pedestrians and road users. Subsequently their focus when riding is the safety of pedestrians, other road users and themselves. Our members ride PMDs for many of the reasons stated in the Consultation RIS (page 9) despite not having a legal framework to do so.

Firstly, we wish to praise the NTC for the progress made on the framework for PMDs.

At a high-level our comments on the framework proposed are as follows:

1. PMD definition oversight "when propelled only by the motor, cannot reach a speed greater than 25km/h on level ground".

The maximum capable speed cap in the PMD definition inadvertently *excludes* most common PMDs (including PMDs referenced in the *Consultation RIS Appendix F*) as most are capable of operation above 25km/hr on level ground by design (see table in our Question 1 response and member device poll chart beneath it).

- 2. The maximum capable speed cap introduces a coverage hole for insurance liability. For instance, a PMD rider may assume their commonly used device is legal but due to the maximum capable speed limit definition it is technically not a PMD by definition and thus out of insurance coverage.
- 3. A device-level speed cap does not exist for *non-electric bicycles* (for which comparable safety data and evidence of rider self-regulation exists) or *motor vehicles* and we believe PMDs should follow suit. The focus of permitted road device definitions (such as PMDs, bicycles, e-bikes / pedelecs, etc) should primarily be on *contexts* and *associated rules compliance* (where speed limits are covered by *context* not device *definition*). Most PMD riders presently follow the road rules applicable to bicycles with the exception of riding on footpaths at <10-15km/hr and we believe the proposed framework should reflect this current real-world use.</p>
- 4. While we believe a defined capable speed limit is *not necessary* for **privately owned** PMDs, **for-hire PMDs** should be speed-limited to 15-20km/hr due to casual hire rider's lack of awareness of PMD-specific road rules. This distinction avoids penalising responsible PMD users due to a cohort that is perceived as irresponsible or dangerous by the general public.
- 5. Device-level speed restrictions taken from the Australian Design Rules that apply to pedelecs should not influence the definition of PMDs. It is a common view of our members that device-level

e-bike speed capabilities in the Australian Design Rules are unnecessarily restrictive. When compared to speeds commonly travelled by non-electric bicycles in commuting contexts the 25km/hr limit is far too low. When these rules are ignored by consumers they are exposed to fines for riding an electric bicycle with a similar speed capability as a non-electric bicycle which makes no sense. We would like the PMD framework to avoid this unnecessary device-level speed restriction from the outset and focus on *use contexts* and *associated rules*.

- 6. Wramborg's *model for fatality probability* is referenced as a significant basis for speed risk assessment however it has been critiqued as inadequate for policy construction in peer-reviewed literature¹. Actual severe injury and fatality rates are much lower than the graph indicates and occur at much higher speeds (see our response to Question 5).
- 7. **Option 4** covers the majority of use-cases our community utilise PMDs for (commuting and recreation), however we recommend mitigating risk by introducing a cap at 50km/hr roads without Bike Lanes (stay left) and 60km/hr with Bike Lanes.
- 8. The **Speed Approach** should be as per bicycle general use 10km/hr near pedestrians, 10-25km/hr max in shared path contexts (due to rider self-regulation as research indicates), and 40km/hr in permitted road contexts. Such contexts are detailed in our response to Question 6. We believe this would allow commuters to realise the full potential of their PMD in such contexts without the introduction of significant risk.

¹ Proposed vehicle impact speed - severe injury probability relationships for selected crash types ARRB Group Ltd: Chris Jurewicz, Dr Amir Sobhani; Centre for Automotive Safety Research, University of Adelaide: Dr Jeremy Woolley, Dr Jeff Dutschke; Corben Consulting: Dr Bruce Corben https://acrs.org.au/files/papers/arsc/2015/JurewiczC%20256%20Proposed%20vehicle%20impact%20speed%20-%20 severe%20injury%20probability%20relationships%20for%20selected%20crash%20types.pdf Question 1: "Are the requirements in the proposed regulatory framework appropriate? Are there any requirements that should be removed, included or modified? Please provide a rationale to support your position."

PMD speed capability definition

The proposed regulatory framework places a cap on the speed *capability* of PMDs: "when propelled only by the motor, cannot reach a speed greater than 25km/h on level ground"

This definition has the effect of **excluding** most PMDs the community expect to be covered.

Device	Туре	Advertised maximum speed (level ground)	Covered by PMD 25km/hr definition?
Onewheel	self-balancing electric skateboard	30km/hr (power cut-out at 37km/hr)	No
Boosted Stealth	electric longboard	39km/hr	No
Meepo AWD PRO	electric longboard	55km/hr	No
ZERO 10X (escooter)	electric scooter	65km/hr	No
Gotway Monster 100V	electric unicycle (EUC)	60km/hr	No

A December 2019 poll of several Australia-based PMD rider communities (listed at the end of this submission) discovered that **87% of privately owned PMDs were capable of speeds greater than 25km/hr by design**.



We believe the maximum capable speed of the PMD should <u>not be included</u> in the definition of a PMD.

Rationale:

- 1. Motorcycles, motor vehicles and bicycles are not defined by a top capable speed yet they can travel at speeds that well exceed national speed limits.
- Bicycles legally operate on both road and shared path contexts. Riders are expected to follow the speed limits of the contexts they are using regardless of the capability of their bicycle. Likewise, PMD operators should be subject to the legal top speed of permitted contexts regardless of the capability of their device.
- 3. As stated in the Consultation RIS, the research indicates bicycle and PMD riders self-regulate their speed to accommodate pedestrians (Boufous et al, 2018, Dowling et al, 2015). This has been the observation of e-Riders United Australia's members also.
- 4. Many privately owned PMDs do not have an effective means of speed detection, which is acknowledged in the Consultation RIS. As per point 2, this demonstrates a double-standard compared to bicycles that also share this characteristic but are not subject to maximum speed restrictions in their definition. This factor further demonstrates that a maximum device speed definition is not necessary.
- 5. Wramborg's *model for fatality probability* is referenced as a significant basis for speed risk assessment however it has been critiqued as inadequate for policy construction in peer-reviewed literature². Actual severe injury and fatality rates are much lower than the graph indicates and occur at much higher speeds (see our response to Question 5). Reliance on (or influence by) this model results in an over-cautionary approach that is not informed by gramular real-world data.
- 6. By including a maximum capable speed in the definition most PMDs will be ridden outside of the legal framework. This has implications on insurance coverage as insurers will likely introduce products that cover legally defined devices however most actively used devices will fall outside the proposed legal definition. If injury or damage occurs liability will become a serious matter if the PMD definition does not match real-world use-cases.

Selective speed limiting

In our opinion, the main PMD-related risk to pedestrians and other road users are PMD operators who are not familiar with the road rules applicable to PMDs or responsible PMD operation. This is almost entirely restricted to riders utilising for-hire e-scooters by companies such as Lime. These PMDs have a low barrier for entry / usage and require no familiarisation with road rules or responsible PMD operation. As such, speed limiting of 15-20km/hr via on-device hardware or software should be mandated for PMDs provided *by hire companies*.

Limiting of *privately owned* PMDs should not be mandated (as is acknowledged in the Consultation RIS as being impractical or impossible) as their owners/riders are deemed as a more informed and responsible cohort.

Road Rules awareness and responsibility

In addition to the PMD rider's own diligence, it should be the responsibility of retailers and importers to reiterate that national & state road rules apply to PMDs. This may take the form of a simple leaflet inserted into packaging (or sticker) referencing the Australian Road Rules and instruction to observe state-level road rules applicable to Personal Mobility Devices.

² Proposed vehicle impact speed - severe injury probability relationships for selected crash types

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Question 2: "Is 60kg a suitable maximum weight for a PMD? If not, what is a more suitable weight and what other factors should be considered? Please provide a rationale to support your position."

e-Riders United Australia does not contend the maximum weight limit proposed.

If it would help the case for removing the device-level speed limit for non-hired / privately owned PMDs a lower maximum weight would be acceptable.

Most PMDs are well below half this limit, so we presume this high limit has been added to accommodate Segway Personal Transporters by tourism operators.

Question 3: "Should children under the age of 16 years old continue to be permitted to use a motorised scooter incapable of travelling more than 10km/h on level ground on roads and paths? Or should they be able to use any device that complies with the proposed PMD framework? (see Appendix A). Please provide a rationale to support your position."

Evidence demonstrates that **under adult supervision** PMDs can be operated by children as young as 6 years old on **non-road contexts**: <u>https://www.instagram.com/onewheelkids/</u>

We believe children 6 years or older should be allowed the use of PMDs on **non-road contexts** if **supervised by a responsible adult** and the PMD does not travel faster than **10km/hr**. Appropriate protection (helmet, wrist & knee guards) are recommended.

As bicycles have become a ubiquitous mode of early transport taught to young children, we see a future where responsible PMD usage skills are taught at an early age to ready children for this soon-to-be common form of personal transport.

Question 4: Do you agree with the criteria selected to assess the options? Are there any key impacts not covered by these criteria?

At surface level the assessment framework seems sound however the approach to applying it (assessing safety impact) doesn't seem empirical. For instance, the statement on page 55 (E 3.4) "[Option 4] is assessed as likely to result in a *major increase in safety risk to PMD users*" however this doesn't seem quantified thoroughly or mitigated through restriction of road use contexts (such as those proposed in our Question 7 response).

It would be interesting to see how bicycles would fare when assessed under the same assessment criteria. We perceive there to be a distinct double-standard between PMDs and non-electric bicycles (in regards to capped 25km/hr speed limit on road contexts). The same is true for electric bicycles (with an arbitrary 25km/hr cap due to Australian Design Rules). If non-electric bicycles were assessed under this assessment criteria (and an arbitrary 25km/hr speed cap) we imagine there would be a significant reduction in accessible infrastructure due to *perceived*, not actual, risk.

PMDs are **presently being used** (without legal affordance in some states) in the same contexts as bicycles in addition to footpaths in all Australian states. With little evidence to indicate actual risk (ie injury statistics) we recommend a framework more aligned with **bicycle road rules** with the addition of footpaths as a permissible use context (see our response to Questions 6 & 7). Given the majority of PMD riders own

devices that *exceed* the proposed framework's maximum capable speed³ it should prompt further consideration of PMD/motor vehicle speed differentials and thus a reduced risk perception of > 25km/hr operation and road contexts. The ambiguity of *Wramborg's model for fatality probability* in respect to collision speed (is it the *sum speed delta* between two moving objects or the speed of collision against a stationary object?) and lack of empirical data to back the model should also prompt reconsideration of this as a blocker to > 25km/hr road use.

In regards to speed safety, certain design qualities should be considered by the individual regarding the appropriateness of their device for use in permissible contexts (ie Segway Ninebot W1 Drift E-Skates would not be appropriate for use in Bike Lanes / road contexts) - see our response to Question 5 (design factors).

Question 5: When considering the safety risk assessment, access and amenity impacts, broader economic impacts, as well as compliance and enforcement impacts; has the impact analysis sufficiently considered all relevant variables and available evidence? What other factors could be included in the analysis? Please provide any additional evidence. (See Appendix E - Impact Analysis)

Other factors may include:

• Risk impact differentiation based on *privately owned* vs *hired* PMD use.

Our perspective is the two cohorts exhibit different levels of knowledge of road rules, safety factors, barriers to entry/participation and general regard for the condition of PMDs. The outcome of such an analysis would likely be:

- Differentiation in risk mitigation (such as speed limiting hired PMDs to 15-20 km/hr and *not* imposing device-level speed limits on privately owned PMDs).
- Differentiation in permissible use contexts (such as indicated in response to Questions 6 & 7 below).
- The inadequacy of Wramborg's *model for fatality probability* for policy construction. Wramborg's model is extensively critiqued as inadequate in the referenced literature:⁴
 - lack of detail on severe vs fatal injury,
 - o no information on research source for graphed collision vs fatality probability relationships,
 - lack of clarity around whether collision speed is a sum delta between two moving objects or a collision with a stationary object,
 - disparity between graph and real fatality data ("[The] average fatality risk in a casualty crash is in the range 1%-7% in 80 km/h speed zones, depending on crash type (Victorian crash data 2008-13, based on uncongested periods between 7 pm and 5 am). Since casualty crashes are a fraction of all impacts, these fatal percentages would be even lower if all impacts were considered.")⁵.

Subsequently, we believe this model (and Road Rules / Australian Design Rules that are based on or influenced by it) should be excluded from influencing the Definition and Road Rules for PMDs.

³ Personal Mobility Device Survey data:

https://www.dropbox.com/s/7mtxvx5h9ep06qf/%20Personal%20Mobility%20Device%20Survey.csv?dl=1 ⁴ Proposed vehicle impact speed - severe injury probability relationships for selected crash types

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- The need for updates to the Australian Design Rules to specifically address different *types* of PMDs (and additionally address the arbitrary maximum device speed limitation on e-bikes).
- PMD design factors and their associated safety impact, ie
 - capability for shock absorption ie:
 - pneumatic wheels
 - wheel diameter and width
 - suspension
 - deck length for 2+ wheel devices
 - braking capability
 - ground clearance for single-wheel devices
 - requirement for deck grip
 - effective feedback and safety controls when approaching maximum device speed capability (especially for single-wheel devices)

There are anecdotal factors that relate to the use of PMDs however we acknowledge none of these have a direct correlate to risk, amenity, costs, compliance or enforcement:

- reduced environmental impact (83% travel up to 200km a month using their PMD for non-recreational use),
- reduced congestion (75% replaced a car or motorcycle with a PMD for non-recreational use),
- reduced strain on public transport (85% reduction in public transport use by members polled), and
- improved mental health (95% of members reported an improvement to mental health).

Statistics are from the PMD community poll referenced at the end of this submission.

Question 6: What do you believe is the most appropriate road infrastructure for PMDs to access: footpaths, separated paths, bicycle paths and/or roads? Please provide a rationale to support your position.

Context	Privately owned PMDs	Hired PMDs
Bicycle paths		Selection of the select
	Bicycle paths with barrier kerbs (as pictured above) are the per operation of PMDs - where the device's full capability can be utilis a barrier to separate riders from traffic allows PMD operators to for PMD operation and reduces risk of collision with other road users Speed limits in this context should match bicycle/road speed device definition limit). Extensive documentation on the design considerations of such lar	fect context for the ed. The presence of cus on their lane and (parked or mobile). limits (no 25km/hr
	deficiencies of non-barriered 'simple bike lanes') can be found in t Melbourne's Bike Lane Design Guidelines ⁶ .	he City of
	Bicycle paths or 'simple bike lanes' that are <i>not</i> protected with a barrier kerb (as pictured below) are being used by our community on roads up to 60km/hr with no reported incidents, however we acknowledge they are not considered safe for bicycle riders or PMD riders.	11- e-10
	We do not see sufficient cause to restrict PMD operators from such bicycle infrastructure. We see PMDs and bicycles as impacted by the same safety factors and operational concerns while sharing similar speed capabilities.	
	In addition to motor vehicle proximity issues (both parked and mobile), the condition of bicycle paths / lanes can be hazardous to both bicycle and PMD riders if not well maintained (i.e. recessed manhole covers, holes/gaps, and inconsistent surface level/condition). Bicycle and PMD operation conditions however it raises the question of responsibility over accorditions.	o operators ride to the over acceptable bicycle path

⁶ https://www.melbourne.vic.gov.au/sitecollectiondocuments/bike-lane-design-guidelines.pdf

Context	Privately owned PMDs	Hired PMDs	
Footpaths	With PMD operation of 10 km/hr there is little evidence of significant risk to pedestrians and riders. Footpaths allow PMD riders convenient, safe, and efficient access to their workplace, shops, cafes, recreation venues, etc where roads may be unsafe to do so.	Devices to be speed-limited to 15-20km/hr due to hired PMD rider's presumed lack of	
Separated footpaths	Perfect for the operation of PMDs ⁷ (with speed limit of 10km/hr around pedestrians and top speed of 25km/hr when not around pedestrians).	PMD operation and/or PMD road rules.	
Roads - up to 40km/hr limit	Due to the capability of many PMDs of reaching speeds near or above this limit (thus the minimal impact on road users) this context is appropriate for PMD use.		
Roads - 50km/hr limit	Due to the capability of many PMDs of reaching speeds near this limit, often minimal traffic found on 50km/hr local roads , and therefore minimal impact on road users this context is appropriate for PMD use. Caveat is to ensure PMD riders stay left and allow motor vehicles to pass out of courtesy (as bicycle & PMD riders usually do).	Not permitted due to rider's presumed lack of familiarity with safe PMD operation or PMD road rules, and speed differential of speed-limited 15-20km/hr device.	
Roads - 60km/hr limit	Bike Lane use only.		
Roads - over 60km/hr limit	Not appropriate due to PMD top speed capability and speed differe users to PMD operators (even with Bike Lane).	ntial of other road	

⁷ https://www.facebook.com/EvolveSkateboards/videos/583173332488272/ "6 reasons you need to ride an Evolve to work." [video sighted 12 Dec 2019]

Question 7: What is an appropriate and safe maximum speed that PMDs should be permitted to travel across the various infrastructure: (a) pedestrian areas, (b) bicycle areas, and (c) roads? Please provide a rationale to support your position.

Context	Max speed
Pedestrian areas	10 - 15 km/hr
Such as Footpaths and Shared Paths	With PMD operation of 10-15 km/hr there is little evidence of significant risk to pedestrians and riders.
	Although heavily disputed as a reliable model ⁸ , <i>Wramborg's model for fatality probability vs. vehicle collision speeds</i> (Jurewicza et al, 2015; Wramborg, 2005) indicates the risk of fatality at these speeds for pedestrian/cyclist collision at an acceptable 2-3%. Anecdotally, there may be further PMD-specific design factors that further lower this probability, such as a riding position (feet closer to the ground, upright body, device width and associated collision avoidance capability).
	As stated in the Consultation RIS, the research indicates bicycle and PMD riders self-regulate their speed to accommodate pedestrians (Boufous et al, 2018, Dowling et al, 2015) thus the risk is deemed to be low.
	This speed range matches the general speed of our members around pedestrians without any reported incidents. Our members are particularly aware of pedestrians wearing headphones, using smartphones, or walking animals and always lower speed to reduce the risk of collision.
Non-road bicycle	10 - 25km/hr
areas (with pedestrian presence) Such as Separated Footpaths	As per existing bicycle operation in same context.
	The expectation of PMD riders would conduct themselves the same as bicycle riders who often travel at 10km/hr or less around pedestrians and up to 25km/hr on Shared Paths / Separated Footpaths when no pedestrians are ahead.
	As stated in the Consultation RIS, the research indicates bicycle and PMD riders self-regulate their speed to accommodate pedestrians (Boufous et al, 2018, Dowling et al, 2015) thus actual risk is far lower than perceived risk.
Roads and	40km/hr
on-road bicycle areas (no pedestrian presence)	Roads (with / without Bike Lane) up to 50km/hr : Due to the capability of many PMDs of reaching speeds near or above this limit (and thus a minimal speed differential on 40-50km/hr roads), and often minimal traffic found on many 50km/hr local roads , it is perceived that there would be minimal impact on road users in \leq 50km/hr road contexts.
	Caveat would be to ensure PMD users stay left and allow motor vehicles to pass out of courtesy (as bicycle & PMD riders usually do).
	PMD riders need to be aware of the capabilities (and design factors) of their PMD before considering road use at up to 40km/hr (such as deck length, truck width,

⁸ Proposed vehicle impact speed - severe injury probability relationships for selected crash types

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Question 8: Do you agree with the overall assessment that Option 3, Speed Approach 1 is the option that best balances mobility and safety? If not, which option and speed approach do you prefer? Please provide a rationale to support your position

e-Riders United Australia supports **Option 4** as we contest the perceived risk attributed to it - especially if the risk were **mitigated** with a maximum of 60km/hr roads with Bike Lanes and speed-limiting of for-hire PMDs.

When coupled with a new Speed Approach that is more aligned with current / real-world bicycle and PMD use (detailed in Question 7 response) we believe **Option 4** best balances mobility and safety.

Submission prepared by Shannon Murdoch in consultation with **e-Riders United Australia** members and members from the following Facebook Groups:

Electric Skateboarders Australia - ESK8AUS (1,400+ members) Onewheel Riders Australia (460+ members) Onewheel Riders Melbourne (60+ members) Electric Riders Melbourne (1,300+ members) Sydney Electric Skateboarders - ESK8 Sydney (1,100+ members) eWheel Sydney (200+ members)

Personal Mobility Device Survey data:

https://www.dropbox.com/s/7mtxvx5h9ep06qf/%20Personal%20Mobility%20Device%20Survey.csv?dl=1