

## **Inquiry into e-mobility safety and use in Queensland**

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## Submission <sup>1</sup> to State Development, Infrastructure and Works Committee in relation to the Inquiry into E-mobility safety and use in Queensland, by Associate Professor Terry Goldsworthy<sup>2</sup>.

### Introduction

This submission will deal with the issues around e-mobility safety and use in Queensland, with the following terms of reference:

*That the State Development, Infrastructure and Works Committee inquire into and report to the Legislative Assembly no later than 30 March 2026 on:*

- 1. Benefits of e-mobility (including both Personal Mobility Devices (PMDs), such as e-scooters and e-skateboards, as well as e-bikes) for Queensland;*
- 2. Safety issues associated with e-mobility use, including increasing crashes, injuries, fatalities, and community concerns;*
- 3. Issues associated with e-mobility ownership, such as risk of fire, storage and disposal of lithium batteries used in e-mobility, and any consideration of mitigants or controls;*
- 4. Suitability of current regulatory frameworks for PMDs and e-bikes, informed by approaches in Australia and internationally;*
- 5. Effectiveness of current enforcement approaches and powers to address dangerous riding behaviours and the use of illegal devices;*
- 6. Gaps between Commonwealth and Queensland laws that allow illegal devices to be imported and used;*
- 7. Communication and education about device requirements, rules, and consequences for unsafe use; and*

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<sup>1</sup> The author stress that, throughout this submission, the views expressed are those of the author; and do not necessarily reflect the opinions of their employer, Bond University.

<sup>2</sup> Dr Terry Goldsworthy ([tgoldswo@bond.edu.au](mailto:tgoldswo@bond.edu.au)) is an Associate Professor of Criminal Justice and Criminology, in the Faculty of Society and Design at Bond University. He was previously a Detective Inspector with 28 years' service in the Queensland Police Service and separated from the service in 2013.

*8. Broad stakeholder perspectives, including from community members, road user groups, disability advocates, health and trauma experts, academia, the e-mobility industry, and all levels of government.*

E-mobility, which includes Personal Mobility Devices (PMDs) like e-scooters, e-skateboards, and e-bikes, signifies a significant transformation in urban transportation. As Queensland addresses the combined priorities of sustainability and safety, this enquiry is a timely opportunity to assess the advantages, hazards, and regulatory structures associated with e-mobility. This submission will address each term of reference, utilising empirical evidence where available, anecdotal observations of the author, and policy analysis.

## Benefits of e-mobility (including both Personal Mobility Devices (PMDs), such as e-scooters and e-skateboards, as well as e-bikes) for Queensland.

E-mobility has substantial environmental, economic, and social advantages. Queensland's Zero Emission Vehicle Strategy identifies enhanced air quality, decreased transportation expenses, and the creation of new industries and job prospects (Queensland Government 2025). E-bikes and PMDs facilitate a transition from private vehicles, alleviating congestion and diminishing greenhouse gas emissions. They also improve connectivity, especially in metropolitan and peri-urban regions without adequate public transportation.

E-mobility offers individuals economical, adaptable, and time-efficient transportation, particularly for shorter journeys. It offers governments the chance to redefine public spaces, diminish parking requirements, and encourage active transportation. These advantages correspond with Queensland's overarching objectives for sustainable urban development and transportation equity (Queensland Department of Transport and Main Roads, 2023).

The 2023 report on the Australian cycling and e-scooter economy estimated that from 2020 to 2022 the number of electric powered e-bikes had increased by over 50% to 193,000 and estimated that some 61,500 e-scooters had been purchased in 2022 (We Ride Australia, 2023).

## Safety issues associated with e-mobility use, including increasing crashes, injuries, fatalities, and community concerns.

Notwithstanding their potential, PMDs and e-bikes have been associated with a significant increase in injuries and fatalities. PMDs and e-bikes have a number of safety issues which encompass the below:

- Excessive speed on footpaths and shared walkways, jeopardising pedestrian safety.
- Insufficient helmet utilisation, especially among youth.
- Dangerous driving in public roads and the impeding of other vehicular traffic.
- Insufficient visibility at night, resulting from inadequate illumination or reflective apparel.

The Queensland Walks policy statement emphasises that PMDs can compromise pedestrian safety, particularly for elderly individuals and those with disabilities (Queensland Walks, n.d.). They propose a Safe System approach as being essential—one that amalgamates infrastructure design, speed regulation, and user conduct (Queensland Walks, n.d.).

The author has personally witnessed on many occasions the use of PMD's and e-bikes in a dangerous fashion that would *prima facie* be sufficient for the user to be charged with Dangerous Driving under section 328A of the *Criminal Code 1899*. Such behaviour has primarily been conducted by dirt e-bikes and non-compliant 200-watt devices. These behaviours include exceeding the speed limit on public roads, blocking traffic, ignoring red lights, doing wheelies often with one foot propped on the seat, using mobile phones whilst riding, just to highlight some of the illegal behaviours.

On shared pathways the author has regularly been directly affected by dirt e-bikes and non-compliant 200-watt devices travelling on shared footpaths at speed greatly in excess of the 12km/hr limit on such paths. On at least two occasions when asked to slow down and comply with road rules the riders stopped and turned around and threatened the author.

There is substantial empirical evidence as to the negative health impacts associated with the use of PMD's. The significance of trauma was illustrated by a study of PMD-related injury patterns in Singapore (Koh et al, 2022). The study noted that PMD related orthopaedic traumas are high-energy injuries, exhibiting elevated incidence of open fractures in comparison to bicycle injuries (Koh et al, 2022). An Israeli study concluded that e-bikes were a significant cause of injury and hospitalisation in the paediatric population, particularly among older children (Zmora et al, 2019). A study of injury data showed that within the paediatric population, there is an ongoing rise in the frequency and severity of injuries and fatalities associated with e-bikes and e-scooters (Moati et al, 2025). It highlighted that current personal and road safety regulations are insufficient in preventing these injuries, underscoring the imperative need for better regulation and more stringent enforcement. (Moati et al, 2025).

A UK study noted that the burden of trauma associated with e-scooters had increased since their introduction (Northway et al, 2022). It highlighted that helmet use was exceedingly uncommon, and youth were experiencing head and extremity injuries. Significant injuries, such as intracranial haemorrhage and open fractures, were being sustained, and there were substantial attendances and admissions (Northway et al, 2022).

In April 2023, the Broome Shire, Western Australia executed a contract to supply 300 e-scooters for a shared micro-mobility platform (Briotti et al, 2024). During the 12-month study period, 190 patients were identified as having received injuries from e-scooters. Injuries predominantly occurred between 6pm and 12am (28%), with 53% of patients indicating intoxication, and 75% not wearing a helmet (Briotti et al, 2024).

A Victorian study found that since that state government has introduced a e-scooter ride sharing scheme these devices were associated with a significant trauma burden and the rate of injury had increased since the introduction of the ride-sharing scheme (Talia et al, 2023). Some 58% of patients identified in this study were alcohol or drug affected (Talia et al, 2023). Another Victorian study found that the incidence of face fractures linked to e-scooter usage has risen since the initiation of the shared e-scooter trial (Gearing et al, 2024). During the study period, 849 patients had treatment for face fractures, with 34 cases linked to e-scooter usage. Fifty percent of individuals injured while operating e-scooters were under the influence of alcohol, and 25% were utilising helmets (Gearing et al, 2024). Victorian Injury Surveillance Unit data

indicates that the number of significant injuries sustained by e-scooter riders is on the rise, and these injuries are substantial (Oxley and Hayman, 2024). The findings regarding injury characteristics and the increasing frequency of e-scooter-related trauma indicated that additional research and efforts to enhance infrastructure, regulation, and behaviour are necessary (Oxley and Hayman, 2024).

A Western Australian study looking at five years of data regarding e-scooter injuries concluded that there was an annual increase in injuries of 385.7% in 2021-2022 (Raubenheimer et al, 2023). Further the study showed 35% of patients were intoxicated with either alcohol or drugs and 54% patients required surgery (Raubenheimer et al, 2023).

A Queensland study looking at three Brisbane hospital emergency department records showed that during a 31-month period there were 1048 emergency department presentations from accidents involving PMDs (Vallmuur et al, 2023). The most prevalent age group was 25–34 years, and the most frequent time of week for presentations was weekends. Males accounted for 64.3% of cases, with the overwhelming majority (90.8%) involving e-scooters. Fractures were the most prevalent injury, accounting for 37% of all injuries. The upper extremities and head/face were the most frequently injured body regions (Vallmuur et al, 2023). Another Queensland study focusing on e-scooters found that they pose a significant injury risk and there were serious issues with non-compliance with safety regulations (Clanfield and Sharman, 2025). The issues identified are consistent with other studies.

*“A total of 176 cases were identified, with a median age of 14 years and 71% were male. Falls accounted for 78% of crashes, while 13% involved motor vehicles. Helmet non-compliance was documented in 42% of the presentations, 12% involved doubling, and 36% exceeded the 25 km/hr speed limit. Fractures occurred in 37% of cases, 18% required computerised tomography scans and 11% sustained life-threatening or potentially life-threatening injuries.” (Clanfield and Sharman, 2025:1)*

News reports indicate similar concerning trends for injuries from PMDs. In 2024 The Childrens Hospital at Westmead in NSW reported a 400% percent increase in injuries from PMDs in 12-months (Jenkins, 2025). In Victoria a 60% rise in e-bike injuries was noted in the 2023/24 financial year (Busch and Grant, 2025). The American Academy of Orthopaedic Surgeons has noted the injury risks of e-bikes and made the observation that injuries in the US from PMDs usage had increased 23% annually since 2017 (American Academy of Orthopaedic Surgeons, 2025).

Data from the Monash University Accident Research Centre provides a useful snapshot of the dangers posed by PMD’s to users in Australia.

*In the five-year period from 1 January 2016 to 31 December 2020, there were 14 deaths reported to an Australian State or Territory Coroner where an electric e-micromobility device, including e-bike, e-scooter and electronic self-balancing device, contributed to the death. Seven of the 14 deaths were related to e-bikes); 7 deaths were in Queensland and <5 in Victoria (by jurisdiction of investigation); 6 deaths were in the age group of 35–44 years; <5 were females. (Berecki-Gisolf and Hayman, 2024:4)*

## Issues associated with e-mobility ownership, such as risk of fire, storage and disposal of lithium batteries used in e-mobility, and any consideration of mitigants or controls.

Data from the Queensland Injury Surveillance Unit, showed the most prevalent injuries that resulted in burn unit admissions, and were caused by lithium-ion batteries, were from e-scooters being 57.1% (Duff et al, 2024). E-scooter battery-related burns were more likely to be deeper in nature and to affect a larger total body surface area than burns caused by other products (Duff et al, 2024).

There are concerns regarding the safety of lithium-ion batteries when it comes to privately owned e-mobility equipment. Worldwide, reports of fires caused by defective or overcharged batteries have prompted discussions over household battery storage, proper disposal of batteries, and the general public's lack of knowledge about these issues.

Consideration should be given to the regulation of appropriate storage of PMDs and e-bikes in buildings, schools and elsewhere especially in consideration of spontaneous thermal runaway caused by battery malfunction.

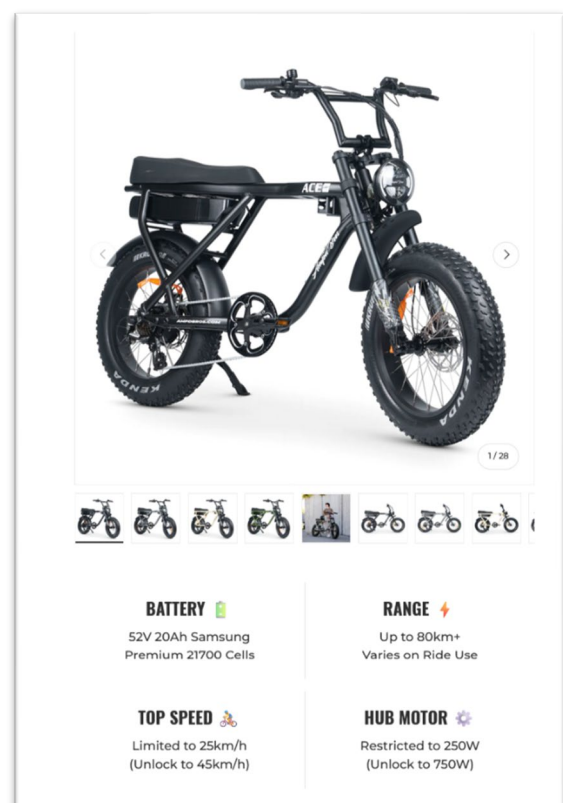
The government should undertake the below to ensure that this risk is mitigated.

- Mandatory battery safety standards aligned with international best practice.
- Public education campaigns on safe charging and disposal.
- Recycling schemes for end-of-life batteries, potentially funded through extended producer responsibility.

## Suitability of current regulatory frameworks for PMDs and e-bikes, informed by approaches in Australia and internationally.

There is confusion as to what is a legal e-bike. These devices are expensive to buy yet they are being ridden by youth. It would be reasonable to assume that parents are buying these e-bikes for their children as a form of e-mobility. There needs to be clear recognition of which PMDs and e-bikes are legal and the public needs to be suitably informed about the specifications around such.

Much work needs to be done around the sellers of PMDs and e-bikes. It is proposed that any retailer of PMDs or e-bikes should be registered with DTMR and subject to inspections to ensure that they are compliant with any regulatory requirements that pertain to the sale of PMDs and e-bikes.





The current situation seems to be a free for all with non-reputable dealers cashing in on the current popularity of PMDs and e-bikes.

A simple search of the term “e-bikes Burleigh heads” on Google brought back a number of e-bike dealers who are actively advertising the fact that e-bikes can be modified to exceed the current regulatory restrictions. See the example of the Ace X Plus electric bike that is advertised as being able to be “unlocked” to a speed capability of 45km/hr and a power output of 750w.

Perhaps consideration should be given to having a category of “e-bicycles” (such as commuter and mountain bikes) that can be ridden without any licencing requirements as normal bicycles are. There could be another category termed “e-bikes” which should require licencing and be restricted in sale to adults only.

This would ensure that youth can still access the benefits of e-mobility but cannot use the more dangerous e-bike category.

Not only should dealers be licenced but all sales of e-bikes and PMDs should require an adult to undertake the purchase of the device and provide sufficient identification so that the name and address of the owner is available for authorities.

## Effectiveness of current enforcement approaches and powers to address dangerous riding behaviours and the use of illegal devices.

The current law enforcement approaches have been ineffective. Enforcement continues to be a vulnerability. The Queensland Police Service (QPS) encounters difficulties in identifying non-compliant devices and enforcing regulations. An example of this can be seen in a recent “Ride Out” that occurred on the Gold Coast<sup>3</sup>.



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<sup>3</sup> Gold Coast Ride out posted to YouTube by Gc-BikeLife at the following URL <https://youtu.be/S2BIPev0boI?si=9SOovMX7JfetRNYV>

Speeding, riding without helmets, and the use of illegal PMDs continue to contribute to hazardous riding behaviour. In the video numerous acts of dangerous driving can be seen being committed by riders of PMD's. Of concern is that at the start of the video as the group of riders gather uniform police arrive at the scene as do the media.

A police vehicle and two police road bikes attend to the scene and merely watch the 30 plus riders speak to the media and then ride off onto the road. The riders then continue to travel along the Gold Coast highway in broad daylight causing chaos. The riders go from Miami to The Spit at Surfers Paradise without any apparent hinderance.



The seeds for this inaction can perhaps be found in the frustration voiced by a senior officer of the QPS Highway Patrol. In response to this video the officer stated:

*“You know we have NO legislative nor policy support when it comes to these bikes when the rider evades - and they all know not to stop for Police ... even normal kids know they are immune to police action ... My officers will not and should not engage with these youths when they fail stop.”<sup>4</sup>*

So essentially, we are at a point of anarchy where riders of PMDs no have no fear of the police or any enforcement action. This result can be traced back to the restrictive police pursuit policy introduced by the previous government in 2010. This is merely reinforced by observations of the author at Mooloolaba, Queensland in December 2024 when I observed 3 riders on PMDs riding down the main esplanade at 6pm at night with a marked police van directly behind them. The riders blocked the road and filmed themselves yelling at the police van. The police van subsequently turned off and the riders continued on their way.

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<sup>4</sup> Personal communication to the author in May 2025.



The same QPS officer observed that the UK Police are now fighting fire with fire and are themselves using PMDs like Surron e-bikes to combat crime.

*“The UK POLICE use Surrons for this very purpose but the difference is they have a proactive and supportive pursuit policy.. I can't tell you the amount of youths that literally give us the finger and ride away knowing we are powerless to stop them.”*

The QPS needs to invest in a fleet of Surron type PMDs to combat the growing problem of PMD misuse. The days of a bike squad being officers mounted on pedal driven bikes is history.

As has been noted “This investment in the Met’s electric fleet forms part of a crackdown on criminals who are using modified Surrons that exceed the 15.5mph speed limit for e-bikes” (Levin, 2025).

The enforcement component is still lacking. Dangerous riding practices, like as speeding, without wearing a helmet, and disobeying traffic signals, continue despite strict punishments. QPS compliance checks should be conducted at schools at start and finish times to ensure that any illegal devices are not being used.

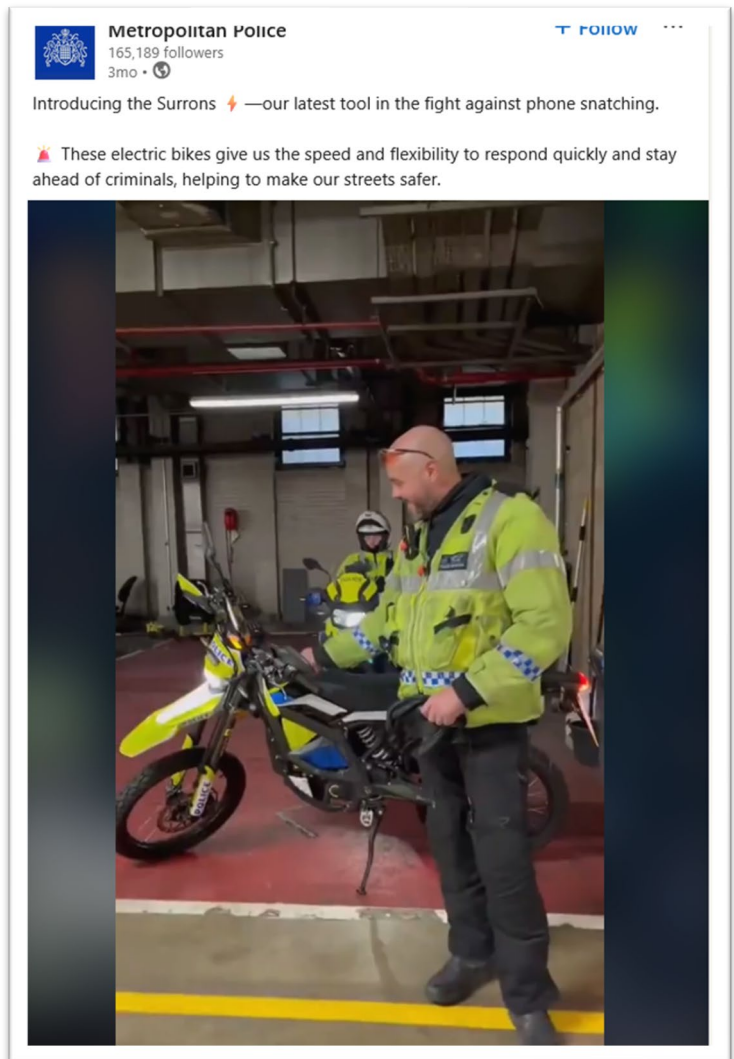
The QPS needs to consider the establishment of dedicated e-bike squads to target problem areas such as the Gold Coast. Consideration should also be given to the impounding and destruction of any PMD or e-bike found to be committing a traffic offence (the nature of offences to be included would need to be determined).

## Gaps between Commonwealth and Queensland laws that allow illegal devices to be imported and used.

A critical regulatory gap exists between Queensland's usage laws and Commonwealth import laws. Devices that exceed local power or speed limits are permissible for importation; however, they are prohibited for use on public roads and paths. This leads to confusion for both enforcement agencies and consumers.

A coordinated response is required, which includes:

- Stronger import controls on non-compliant devices.



- Clear labelling requirements at point of sale.
- National standards for PMD design and performance.

Such alignment would reduce the prevalence of illegal devices and improve consumer safety. The importation of non-compliant PMDs and e-bikes should be banned, as should the sale of such devices in Queensland.



## Communication and education about device requirements, rules, and consequences for unsafe use.

Public understanding of e-mobility rules remains low. Many users are unaware of speed limits, helmet requirements, or where devices can be legally ridden. Education efforts to date have been fragmented and reactive.

The Department of Transport and Main Roads (2024) Personal Mobility Device Safety Action Plan includes welcome initiatives, such as targeted messaging and stakeholder engagement. However, more is needed. Consideration should be given to

- School-based education for young riders.
- Multilingual campaigns for tourists and CALD communities.
- In-app prompts for shared device users.
- Education should be framed not just around compliance, but around shared responsibility and mutual respect in public spaces.
- Consideration should be given to a targeted advertising campaign highlighting the illegal nature of certain PMDs and e-bikes.
- At the same time as this an amnesty should be conducted for the surrender of any illegal PMDs and e-bikes.

The government must act to bring PMDs back into an environment of lawful use. Whilst there are undoubted benefits to e-mobility, in its current form it poses a clear and continuing danger to other traffic users and pedestrians, as well as to the irresponsible riders of such devices.

  
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