Inquiry into e-mobility safety and use in Queensland

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Queensland University of Technology
response to the
Queensland Legislative Assembly
State Development, Infrastructure and Works Committee
inquiry into e-mobility safety and use in Queensland

QUT welcomes the opportunity to contribute to the Committee's inquiry into e-mobility safety and use in Queensland. We approach this inquiry through two complementary lenses: as the host organisation of the state's pre-eminent road and transport safety research centre, the MAIC-QUT Road Safety Research Collaboration (formerly CARRS-Q, the Centre for Accident Research & Road Safety – Queensland); and as a significant major custodian and operator of campuses (comprising land, buildings and other facilities) that host tens of thousands of staff and students each day and that are largely open to public access and use.

The MAIC-QUT Road Safety Collaboration (MQ Collab) is funded by the Motor Accident Insurance Commission to conduct research focused on advancing Road Transport Psychology and Road Transport Safe Systems. It is one of the leading organisations in Australia in relation to research into the safety of e-scooter use. The MQ Collab e-scooter research includes:

- An international review of the safety of e-micromobility including comparisons between e-scooters (and other new forms) and electric bicycles;
- A series of observational studies of e-scooter and bicycle use in the Brisbane CBD ranging from the commencement of shared e-bikes in 2010 to October 2021 – these studies compared locations of riding (footpath, road), safety behaviours and interactions with pedestrians by users of shared and private e-scooters and bicycles;
- An observational study of risky behaviours of delivery and non-delivery bicycle and e-bike riders and e-scooter riders in central Brisbane nearby suburbs in 2021;
- An international survey comparing shared and private e-scooter user and non-user knowledge of laws, attitudes and safety behaviours in Brisbane, Belgium, the Czech Republic, Norway and Sweden in 2020;
- A repeat of the international survey in the Australian Capital Territory in 2022 and 2023; and
- The Safer Scooting Study, an ongoing longitudinal study of how the safety and patterns of e-scooter riding changes with experience.

MQ Collab is currently finalising an evaluation of the Queensland Personal Mobility Device Reforms commissioned by the Department of Transport and Main Roads (TMR). We note that TMR has committed to sharing the findings of the evaluation with the Committee when it is available.

This submission draws on previous CARRS-Q responses to similar government consultations, including:

- The National Transport Commission (NTC) Consultation Regulation Impact Statement on *Barriers to the safe use of personal mobility devices*;
- The Queensland Government Discussion Paper on *Personal Mobility Devices Access to On-Road Bike Lanes*; and
- The Portfolio Committee No. 6 – Transport and the Arts of the Legislative Council of the NSW Parliament Inquiry into *Use of e-scooters, e-bikes and related mobility options*.

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

QUT recognises e-mobility as a vital component of a sustainable, low-emission transport system that complements public transport and helps reduce dependency on private vehicles. Across QUT's urban campuses, personal mobility devices (particularly e-bikes and e-scooters) are increasingly used by staff and students for both full-journey commutes and travel in conjunction with public transit. These modes offer flexible, affordable, and environmentally responsible alternatives that support Queensland's broader goals for active transport, urban connectivity, and carbon reduction. QUT encourages government initiatives which would continue to expand the accessibility and safe integration of e-mobility into transport networks.

This section focuses on the findings of research by MQ Collab and others regarding the benefits of e-mobility in terms of reducing car trips and the potential health implications of those findings. It then provides some comments on the extent to which e-mobility devices may be impacting on social disadvantage.

1.1 Mode shift

Powered micromobility has been proposed as a solution which can provide a "first and last mile" mobility option to improve access to public transport and an "only mile" option for replacing cars for short trips (European Environment Agency, 2020).

The data provided by operators of shared e-scooter schemes supports the view that they are used mainly for short trips of about 1km in length. MQ Collab's survey of Brisbane e-scooter riders in 2020 showed that half of their shared e-scooter trips were less than 10 minutes long, however, trips by private e-scooters were generally longer, with only 16% being less than 10 minutes long.

The international evidence varies in terms of the extent to which e-scooters replace car trips. The percentages of e-scooter trips that replace car trips reported in evaluation studies from cities that have introduced shared e-scooter schemes have varied dramatically from less than 10% in European cities (Christoforou et al., 2021; Fearnley, Johnsson et al., 2020; Sellaouti et al., 2020) to between about a third and a half in US cities (City and County of Denver, 2021; City of Santa Monica, 2019; Portland Bureau of Transportation, 2018). Internationally, the opportunity for e-scooters to replace private car trips seems to be greater where more travel is by private car and less where public transport is readily available and popular. In MQ Collab's Brisbane survey, 45% of private e-scooter trips replaced driving compared with only 15% of shared e-scooter trips. A similar pattern was observed in MC Collab's Canberra survey (Haworth & Schramm, 2023a).

A concerning finding internationally and in Australia is that e-scooter trips often replace public transport or walking and cycling, or generate new recreational trips, rather than reducing car travel (e.g., Christchurch City Council, 2019). In MQ Collab's Brisbane survey, 60% of shared e-scooter trips replaced walking, compared to 31% of private e-scooter trips. The results were similar in Canberra (65% and 28%). E-scooter trips also replaced cycling and public transport.

1.2 Implications of PMD use for the health of the community

Riding conventional bicycles provides physical and mental health benefits (Celis-Morales et al., 2017; Fraser & Lock, 2011). E-bike use has been shown to provide roughly half the physical activity of riding a conventional bicycle and thus also provides health benefits, albeit at a reduced rate. E-scooters are generally considered to provide little or no physical activity, although little research has examined the effects of PMD use on physical activity and population health.

However, many studies around the world have demonstrated that many e-scooter trips replace walking and so may have negative effects on physical activity and, thus, physical health. The results of MQ Collab's international survey (see Šucha et al., 2023 for an outline) showed that e-scooters replaced walking for many trips and this was most evident for shared e-scooters and multimodal trips. Among multimodal shared e-scooter trips, 72% replaced walking for at least part of the trip, compared with 44% of private e-scooter trips. Both private and shared e-scooters also replaced cycling, particularly e-scooter only trips. In addition to the impact on environmental sustainability, several authors have expressed concern regarding the reduction in physical activity and therefore increased risk of chronic disease which may result (Fearnley, Berge, et al., 2020; Sanders et al., 2020).

In terms of motor vehicle use, we are not aware of any studies that compare any savings in motor vehicle use from shared PMD schemes with the use of motor vehicles to take the PMDs away for charging and to then reposition them. However, a study of docked bicycle schemes (Fishman et al., 2014) showed that the extent of this use of motor vehicles was significant and outweighed the reduction in motor vehicle use in some cities such as London.

Similarly, we are not aware of any research that measures the impacts on physical activity (and thus health) or substituting PMD use for walking and cycling for short trips. From a broader policy perspective, the question arises: should we make the same safety allowances for devices that have little or no health benefit as we do for the bicycle which has proven health benefits?

1.3 Addressing social disadvantage

Proponents of powered micromobility have claimed that it can "address social and economic disparities in mobility by providing reliable, inexpensive, and equitable transportation that links with transit and other modes" (McQueen et al., 2020). Nevertheless, concerns have been raised about the extent to which this is actually happening, with many US studies reporting that most users of shared e-scooters are white males. A recent review examined the extent to which US shared micromobility programs included equity requirements (Brown et al., 2024). Equity requirements can include:

- Alternatives to requiring a smartphone
- Possibility for cash payment compatibility
- Reduced rates for disadvantaged groups
- Multilingual services
- Adaptive vehicles for users with disabilities
- Requirements to service disadvantaged areas

The authors reported that 62% of shared micromobility programs had at least one equity requirement, although only 46% included more than one. They recommend that equity requirements be set out in operating agreements between shared e-scooter companies and local governments, that operational incentives be provided if companies attain specified equity outcomes and that undertaking and evaluating pilot programs could enable learnings and improved outcomes.

Another aspect related to social disadvantage is the high level of concern from people with sensory impairments regarding their fear of being hit by or falling over e-scooters on footpaths.

While little independent research is available, e-scooters, particularly seated, may improve mobility for people with mobility impairments. The Beam shared e-scooter company previously offered seated options in cities such as Brisbane and Canberra. The company has stated that seated e-scooters address the needs of diverse riders including seniors and those with limited mobility (Beam, 2024).

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

Safety is central to QUT's management of e-mobility use in the open campuses areas, which are public accessible spaces. PMD and e-bike related injuries sustained by QUT staff and students are not only inconvenient and even traumatic for the individuals, but also place a financial and human resource burden on QUT through the provision of first aid and injury support, lost time and staff replacement costs.

To minimise risk to QUT staff, students and members of the public, QUT prohibits the riding of PMDs on internal campus pathways, requiring users to dismount and walk their devices in these shared spaces (Walk your Wheels Campaign). QUT has also worked with local rideshare companies, Neuron and Lime, to set up geofencing at both campuses which stops the commercial ride share scooters from working within that space. Surrounding the Gardens Point campus, designated green bike and scooter lanes on public footbridges, riverside pathways, and adjacent road corridors provide a safe, efficient connection to the broader active transport network.

These measures, combined with signage and local enforcement, help mitigate safety concerns while supporting safe access for e-mobility users and for pedestrians. QUT supports further implementation of these designated shared-user connections by local government, in addition to regulatory enforcement of modified devices and travel speeds.

MQ Collab research in this area focuses on opportunities to improve safety for users and the community. Given MQ Collab's research expertise, the focus is on e-scooters, rather than other forms of powered micromobility. We begin this section by providing a brief description of e-scooter safety issues, before examining the likely effectiveness of different approaches to mitigating the risk and severity of injury.

2.1 E-scooter safety issues for pedestrians

While there is widespread public concern about the risks that e-scooters pose to pedestrians, most published studies have focused solely on riders (e.g., Dhillon et al., 2020) or have failed to distinguish between riders and pedestrians (e.g., Aizpuru et al., 2019; Störmann et al., 2020; Vernon et al., 2020). Therefore, there is limited knowledge regarding how many pedestrians have been hit by e-scooters or have fallen over e-scooters on the footpath.

In Queensland, e-scooters and bicycles are allowed to be ridden on the footpath, except where there are signs prohibiting this practice. Many of the off-road paths are shared between individuals undertaking diverse activities, including walkers, cyclists, scooterists, and skateboarders. Observational research in Brisbane in February 2019 concluded that pedestrian perceptions of risk from e-scooters and bicycles being ridden on footpaths may outweigh the objective risks (Haworth et al., 2021). We observed that about 70% of e-scooter and bicycle riders on the footpath travelled within 5 metres of at least one pedestrian, while around 40% rode within 1 metre of at least one pedestrian. Less than 2% of these interactions resulted in conflicts (braking, swerving, calling out). Out of six riders involved in these conflicts, four were using shared e-scooters and two were using private bicycles. All individuals involved were adults, and four conflicts occurred during the afternoon peak period.

Video data collected for TMR just prior to the introduction of the new rules in November 2022 (which allowed riding on roads and in bike lanes at a wider variety of locations) showed that more than 80% of e-scooter riding occurred on the footpath for CBD locations where the alternative was a general traffic lane or an on-road bicycle lane. However, where there was a protected bike lane, less than 10% of riding occurred on the footpath. Less than 25% of e-scooter riding occurred on the footpath in other urban and suburban areas with speed limits of between 40 and 60 km/h (except one site with a 40 km/h speed limit and on-road bicycle lane where about 40% rode on the footpath). Speeds on the footpath were consistently lower on footpaths than on roads. Mean footpath speeds across the sites ranged from 8 to about 18 km/h and mean speeds on roads ranged from 16 to 28 km/h. The TMR data are spot speeds and so it cannot be determined whether riders slow down on footpaths (which has been shown for bicycles) or whether on-road riders have different characteristics to footpath riders (e.g., relatively more private e-scooter riders on roads).

E-scooters have the potential to obstruct footpaths or building entrances, impeding access for pedestrians, especially those who rely on mobility aids such as walkers, canes, and wheelchairs. E-scooters may also obstruct pedestrian and cyclist movement, access to fire hydrants/valves, bike parking or bike-share stations, street furniture, and vehicle street parking. No Australian studies were available but international studies have examined the problem of e-scooter parking using methods such as surveys, observations, and database searches (Bai & Jiao, 2020; Comer et al., 2020; James et al., 2019; Portland Bureau of Transportation, 2018). A study conducted in Indianapolis, Indiana found that approximately 28% of both riders and non-riders reported witnessing a parked e-scooter blocking a disability access ramp (Comer et al., 2020). 2.8% of photographed parked e-scooters in Portland Oregan, obstructed disability access (Portland Bureau of Transportation, 2018). Observational research shows that a large majority (72.8%-97%) of e-scooters were appropriately parked on footpaths and other areas without impeding access or flow (James et al., 2019; Portland Bureau of Transportation, 2018). Nevertheless, between 6% and 10% of parked e-scooters blocked pedestrian footpaths or flow (James et al., 2019). In an analysis of city complaints in Austin, Texas, e-scooters were left on footpaths (n = 1,705), on private property (303), in parks (215) or presented as a general obstruction (1,472) (Bai & Jiao, 2020). Tickets issued in Portland were primarily for improper parking (82%) (Portland Bureau of Transportation, 2018).

2.2 E-scooter safety issues for riders

As the usage of electric scooters has risen, so has concern regarding crashes and injuries linked to them (Caldwell, 2019; Plummer, 2019). Internationally, most injuries to e-scooter riders result from falls as a result of loss of balance (74%) rather than crashes with motor vehicles (Singh et al. 2022). These falls might be linked to instability from small wheels on uneven pavements (Ma et al. 2021).

2.2.1 Inexperience

There is evidence to suggest that inexperienced e-scooter riders are at higher crash risk. International research indicates that around one-third of riders who sustained injuries were riding an e-scooter for the first time (Austin Public Health, 2019; Cicchino et al., 2021; Störmann et al., 2020; Uluk et al., 2022). For example, Uluk et al. (2022) found that 41% of the injured riders in Berlin were visitors. The appeal of e-scooters to tourists may lead to an increase in inappropriate behaviours among users of these shared vehicles (Haworth et al., 2021). The most common risky behaviour among users of shared e-scooters was failing to wear a correctly fastened helmet (Haworth et al., 2021). Tourists who are not familiar with the helmet and road regulations may even have an increased likelihood of injuries while riding e-scooters.

2.2.2 Risky riding behaviours

Risky behaviour among e-scooter riders can be categorised into sex and age demographics, helmet use, alcohol and/or drug use, underage usage, double riding, speed, rider distraction and rider visibility.

a. Non-use of helmets

The growth in e-scooter use has been accompanied by reports of increased e-scooter-related injuries including frequent head injuries. A review of 29 international studies of e-scooter injuries concluded that the head and/or face was the most common injury site on the injured body, comprising 38.8% of emergency presentations (Rashed et al., 2022). Another review of 34 international studies showed that over 98% of the 5,705 injured e-scooter riders presenting to local Emergency departments were not wearing helmets and their most frequent mechanism of injury occurred as a result of loss of balance (74%) rather than crashes with motor vehicles (Singh et al. 2022). These falls might be linked to instability from small wheels on uneven pavements (Ma et al. 2021). In Brisbane, Australia, the head/face was the most commonly injured body part in 952 emergency presentations involving e-scooters between November 2018 and June 2021 (Vallmuur et al., 2023). In Western Australia, injured e-scooter riders who used helmets (43%) had significantly fewer head injuries (Raubenheimer et al., 2023), confirming the findings from an earlier Brisbane cohort (Mitchell et al., 2019).

Most countries do not require helmet wearing for e-scooters and observed wearing rates are generally below 10% (Serra et al., 2021). In Australia, helmet use when riding an e-scooter is mandatory in all states and territories. Observational studies in downtown Brisbane in October 2021 found that helmets were not worn by 36.8% of shared and 7.4% of private e-scooter riders (Haworth & Schramm, 2023b).

b. Impaired riding

The use of alcohol and drugs while riding is common among injured e-scooter riders. In hospital studies of injured riders, alcohol consumption was found for between 10% and 50% of injured riders in most studies (Janikian et al., 2024). It should be noted that most of these studies did not record whether the rider was on a shared or private e-scooter at the time of the crash.

An experimental study showed that as participants' blood alcohol concentration increased, their performance in riding an e-scooter through an obstacle course after consuming alcohol decreased (Zube et al., 2022). There are only a few experimental studies, and most of the studies that examine alcohol consumption utilise hospital data. Hospital studies showed that riders who were injured and tested positive for alcohol were at five times greater risk of sustaining a traumatic brain injury (TBI) than those tested negative (Uluk et al., 2022). Studies on craniomaxillofacial (CMF) injuries have found that the proportion of affected individuals who had consumed alcohol varied from 53% to 91%. Intoxication was found to be closely linked with CMF injury (Shiffler et al., 2021). Several other studies also observed patients with cranial and maxillofacial injuries along with elevated blood alcohol levels (Brownson et al., 2019; Faraji et al., 2020; Kobayashi et al., 2019; Shiffler et al., 2021; Suominen et al., 2022; Wüster et al., 2021; Yarmohammadi et al., 2020).

Use of illegal drugs prior to the crash is also prevalent among e-scooter riders. In a study by Kobayashi et al. (2019), 60% of the patients were subjected to urine sample toxicology screening for drug use. Among those who underwent testing, 52% received positive results. The most frequently detected drugs in positive tests were tetrahydrocannabinol (THC) at 32%, and methamphetamine or amphetamines at 18%. Dhillon et al. (2020) conducted a study in which 17.2% of injured patients were tested for drug use, revealing that 13% had used cannabis (13.8%), amphetamine (4.6%), opiates (8%) and cocaine (1.1%). Several other studies have also examined drug usage among injured e-scooter riders (Bauer et al., 2020; Bloom et al., 2021; Faraji et al., 2020; Hennocq et al., 2020; Lavoie-Gagne et al., 2021; Shiffler et al., 2021; Suominen et al., 2022).

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

QUT has identified that while e-mobility offers significant sustainability and access benefits, the storage and charging of privately owned e-mobility devices on campus presents new safety, infrastructure and risk management considerations, particularly due to the fire hazards associated with lithium-ion batteries. This places a financial and Work Health and Safety regulatory burden on businesses, including QUT, to manage these risks. QUT continues to review a range of measures including limiting storage and charging in designated, less vulnerable locations, bolstering protection of property and critical infrastructure, improving fire detection and response systems, and awareness campaigns to educate users on safe practices.

QUT also acknowledges the growing challenge of lithium battery disposal. The university supports initiatives that improve the design of batteries to enhance safety, durability, and lifespan, and advocates for more sustainable disposal and recycling solutions. Promoting circular economy principles, such as reclaiming and reusing battery components, will be key to reducing environmental harm and supporting a responsible and scalable e-mobility system in the long term.

Additionally, research conducted by our Energy Storage Research Group at the National Battery Testing Centre at QUT shows that battery quality – a major factor in fire risk – is highly variable in consumer products. The implementation of rigorous safety standards, the development of a well-regulated, end-to-end domestic battery manufacturing industry and a crackdown on dangerously substandard imports would significantly reduce risks and costs relating to this aspect.

4. Suitability of current regulatory frameworks for PMDs and ebikes, informed by approaches in Australia and internationally

QUT supports the development of clear, consistent, and nationally harmonised regulatory frameworks for PMDs and e-bikes to ensure both user safety and public confidence in their use. QUT highlights the urgent need for stronger mechanisms governing the quality of PMDs, lithium-ion batteries, charging equipment, and power leads. Sub-standard or incompatible components can increase the risk of fire, especially during charging, and pose a threat to both personal safety and critical infrastructure, particularly where many devices may be stored and charged. The financial imposts of incidents (and even of preventative measures) vastly outweigh the cost of buying good quality batteries and of enforcing quality and safety standards.

QUT encourages the adoption of standards that incorporate international best practice, promote user education, and provide authorities with the necessary tools to regulate emerging risks associated with rapid growth in e-mobility use.

MQ Collab research has focused on the regulatory frameworks for PMDs only, not e-bikes. As part of the Evaluation of Personal Mobility Device Reforms MQ Collab has conducted for TMR, an international review of best practice in PMD regulation was undertaken. The Committee is referred to that report. Some general comments are included below.

The lack of evaluation of outcomes in a coherent manner across jurisdictions means that it is difficult to establish what is best practice from the perspective of safety. One barrier to evaluation has been simply the relatively short time since e-scooters were first introduced. Secondly, e-scooter regulations and the characteristics of e-scooters have changed. Thirdly, there has been poor capture of injury outcomes and relatively poor data on the amounts of riding that have prevented robust estimations of safety risks.

For example, the Queensland e-scooter regulations have evolved over time. Initially, e-scooters (then termed "e-rideables") were not allowed to be ridden on roads with any markings (which effectively prohibited their use on on-road bike lanes), or multi-laned roads or roads with a speed limit of over 50 km/h. Thus, there were very few situations where it was legal to ride on the road and so most riding had to occur on footpaths or off-road paths. Under the original rules, the speed limit for e-scooters was 25 km/h on both footpaths and roads. E-scooters (as e-rideables) were defined as "devices" rather than "vehicles" which meant that many road rules related to vehicles did not apply to them. Not being vehicles also meant that e-scooters were recorded as "pedestrians" in road crash data. A collision between a pedestrian and an e-scooter was not a "road crash" because there was no vehicle involved, technically. Unfortunately, the effects of these changes on e-scooter and pedestrian safety have yet to be evaluated.

Unlike other devices or vehicles for transport and recreation, the major use of PMDs was initially as part of shared schemes. Thus, most of the limited data available about PMDs and their safety and usage relate to these shared schemes, rather than to private use. Many pundits are predicting that private use will grow and potentially overtake shared schemes. Therefore, it is important that any regulatory approach caters to both forms of use and is clouded by current knowledge that is biased toward shared models.

Best practice models should consider the potential differences between private and shared personal mobility devices. These relate to:

- The greater range of regulatory controls that might be possible for shared PMDs (e.g. geofencing);
- The degree of ruggedness required of the manufacture to ensure that safety standards continue to be met;
- Possible differences in skills and motivations of users; and

- Ability to enforce compliance and apply penalties for noncompliance.

Implementing strict rules for shared e-scooters in conjunction with private e-scooters being legal could have unwanted consequences. While the primary aim of strict regulations may be to enhance safety, there is a potential risk that such actions might unintentionally deter people from using shared e-scooters and steer them towards owning private ones, which can be more challenging for authorities to regulate successfully. Based on the experience in Brisbane, the introduction of shared e-scooters did not decrease the use of private e-scooters; in fact, it was associated with increases in their usage. In the Brisbane CBD, there were 7.7 shared e-scooters observed for every private e-scooter in Feb 2019, which fell to 1.8 in October 2019, and then to 1.3 in October 2021 (Haworth & Schramm, 2023b). TMR observational data from October 2022 suggests that there are more private than shared e-scooter trips, particularly outside the CBD. There is little published research on why people might change from using a shared e-scooter to buying their own e-scooter. However, there is widespread speculation that the relatively high cost of regularly using a shared e-scooter, particularly for longer trips, may lead users to purchase their own e-scooter. Our current research is seeking to shed light on this issue.

Best practice approaches to e-scooter regulation should not incentivise e-scooter use over other forms of micromobility which may have better health or environmental outcomes. Introducing a scheme for sharing e-scooters in areas where shared bicycles or e-bikes are present, may lead some users to transition from using shared e-bikes to shared e-scooters. Research by Yang et al. (2021) conducted in Chicago revealed that the introduction of an e-scooter sharing program resulted in a 10.2% decline in bike sharing ridership within the same operational area, potentially causing financial losses for operators of shared e-bikes. Additionally, it is important to consider differences in helmet usage between users of these two modes. According to Haworth and Schramm (2023b) non-use of helmets in Brisbane in October 2021 was more common among riders of shared e-scooters (40.9%) than shared e-bikes (31.1%). Thus, any transfer from shared e-bike to shared e-scooter use could result in a net increase in riders with head injuries.

There is a common view that e-bikes are safer than e-scooters but this is disputed by some (particularly operators of shared e-scooter schemes). Most published comparisons of their relative safety have had significant limitations (e.g., failing to correct for differences in trip lengths, the types of infrastructure used, or shared vs private use). Nevertheless, the likelihood that riders will have some previous experience and the inherent stability of the vehicle are both greater for e-bikes than e-scooters.

If significant growth in e-mobility occurs, particularly as a transport mode and not mainly recreation, then there will be a need to examine the future capacity of facilities and what types of uses should be prioritised. This may involve considering whether growth in e-mobility will require dedicated e-scooter lanes, or shared e-mobility lanes, or whether there will be a need to widen bike paths or shared paths to provide sufficient capacity. Some discussion is occurring regarding the potential for road space allocation to consider kinetic energy and dimensions of vehicles/devices rather than being prescriptive regarding the specific users of particular allocated areas.

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

MQ Collab research has focused on the regulatory frameworks for PMDs only, not e-bikes. The Evaluation of Personal Mobility Device Reforms that MQ Collab has conducted for TMR includes an analysis of enforcement and infringement data and international review of best practice in PMD regulation, including a section on enforcement. The Committee is referred to that report.

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

As mentioned above, the free importation of dangerously sub-standard batteries built in noncompliant and unregulated offshore factories is adding a significant cost and risk burden on the use of e-scooters, along with other consumer products. Clear, nationally uniform legal responsibilities placed on manufacturers, importers and suppliers will help to mitigate fire and electrical risks associated with substandard design and manufacturing of PMDs and e-bikes and accessories. Considerations on how this regulatory reform will apply to large-scale e-commerce platforms such as Taobao, Temu and Amazon that promote consumer-to-consumer retail is also encouraged.

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

QUT is strengthening its communication efforts as part of a broader risk mitigation strategy, with a focus on improving user understanding of battery risks and safe storage and charging practices. However, QUT has no authority to confiscate privately owned equipment which it believes is substandard quality and has limited ability to identify if a PMD or e-bike has been modified or if an incompatible charger is being used. The effectiveness of QUTs communication initiatives would be greatly enhanced by government-leading public awareness campaigns, national product safety standards, and regulatory responsibilities for importers and suppliers of PMDs and e-bikes.

Through our Walk your Wheels Campaign, QUT communicates its expectations of the riding community to respect the safety and amenity of all campus users, by requiring them to dismount and walk their devices and vehicles on internal campus pathways and other shared spaces.

The Evaluation of Personal Mobility Device Reforms MQ Collab has conducted for TMR includes an analysis of rider and public awareness of device requirements, rules and consequences for unsafe use. The international review of best practice in PMD regulation includes a section on education. The Committee is referred to that report.

We trust this advice is helpful to the Committee, and would be pleased to provide further information should that be of assistance.

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