

# Brisbane's developments in e-mobility

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## Abstract

Changes in Queensland transport legislation in 2018 generated a revolution in short distance inner city transport by allowing a wider range of small devices known as personal mobility devices to be used. The use of these devices collectively known as e-mobility, has brought forward a series of policy, regulatory and infrastructure challenges to Brisbane City Council. From an initial trial of 750 devices, Brisbane has expanded to a total of 2000 e-scooters and 800 e-bikes operated by two shared scheme operators in a competitive market. In addition, a vibrant retail industry for e-mobility devices has emerged.

To guide the development of this industry and the regulatory response, Brisbane City Council (Council) has developed an e-mobility strategy, following an extensive community consultation process. This strategy is based on five key policy principles: safety, accessibility, mobility, agility and infrastructure. Council has implemented an ecosystem of shared e-scooter and e-bikes according to the objectives of the strategy and will continue to develop infrastructure and research to improve safety and confidence in this new mode of transport.

## 1. Introduction

In December 2018, the Queensland Government amended the Transport Operations (Road Use Management – Road Rules) Regulation 2009 to allow for a broader range of electric scooters and other innovative personal mobility devices to be legally used in Queensland. Key features of this legislative amendment are:

- Definition of a personal mobility device (PMD) which is a device of a maximum speed of 25 km/h, under 60 kg, and within dimensions (length, width, height) specified in legislation. Devices do not include motorised scooters (mopeds) or motorised wheelchairs.
- Access to paths, including foot paths, shared paths, separated paths and bicycle paths except where a 'no PMD sign' prohibits access. Local councils have the power to prohibit the use of these devices in areas such as malls, esplanades and jetties.
- When travelling on a path a user must give way to pedestrians, travel at a safe speed appropriate to the conditions and be able to stop safely to avoid a collision with pedestrians.

The initial response to this transport disruption by Brisbane City Council (Council) was described by O'Keeffe (2019) who posed a number of policy questions for a major city namely:

- What is the community view?
- Is this a good thing for the city?
- Should government regulate?

- If so, how many e-scooters should be on the streets and how many operators should there be?
- What should the relationship be between government and operators?
- What could operators bring to the table in terms of wider community outcomes?

This paper explores the journey that Council and the industry has taken since 2019 and then outlines the way forward.

## 2. What is e-mobility?

E-mobility devices are predominantly battery powered electric bikes or ‘e-bikes’, electric scooters or ‘e-scooters’, electric skateboards or ‘e-skateboards’, electric pedal assisted or ‘pedelec’ bicycles and other mostly electric powered vehicles, such as Segways and ‘One-wheels’. This does not include motorised scooters (mopeds) or motorised wheelchairs.

The relatively recent expansion of the e-mobility market, in part due to a dramatic reduction in manufacturing and charging costs, has increased its attractiveness as an alternative transport mode to private vehicles and created opportunities for business.

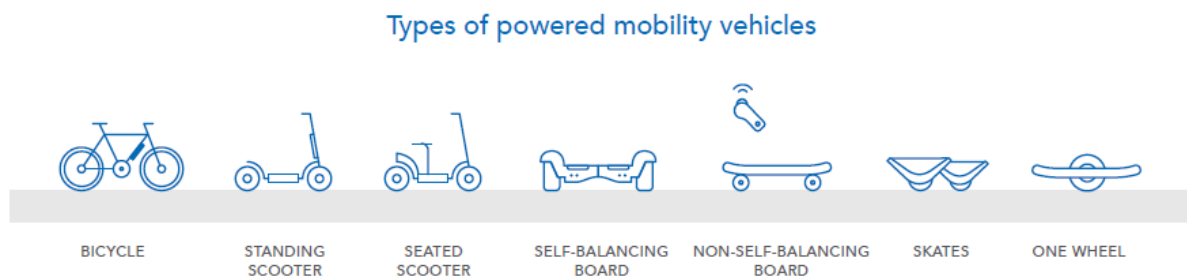


Figure 1: Examples of e-mobility devices

## 3. The two operators

O’Keeffe (2019) demonstrated that in response to these questions Brisbane City Council addressed these key issues through:

- ongoing monitoring of community complaints so that issues could be resolved as they were raised
- regulating through its existing local laws, permits and operating agreements
- the application of a cap on the number of e-scooters operating in the city which was applied on an incremental basis (750 during the trial, 1000 in the first term (one year) of the operating agreement 1500 in the second term of the operating agreement)
- daily compliance monitoring. Although there is the provision for commercial activity on public land and assets, Council saw that there needed to be further operational regulation and monitoring due to the community sensitivity of this new type of operation.

E- mobility in general was seen as a positive for the city since the trial with one operator was launched in November 2018, as it has the potential to reduce car usage by mode substitution

In determining the number of operators, Council considered its proposed cap of 1,000 devices, along with the benefits that multiple operators offer Council and the wider community in providing an environment of ongoing competition to help drive innovation, increased compliance, enhanced service and better pricing.

Following a formal tender process, Council appointed two experienced operators; Lime Network Pty Ltd and Neuron Mobility (Australia) Pty Ltd to enter into operating agreements. These operating agreements:

- were for one-year initial term with the option to extend to a maximum three year term.
- contained additional provisions over and above the provisions of a general permit to operate on Council land and roads (e.g. sharing of data, specifications, service levels, key performance indicators, etc.)

The operating agreements did not specify:

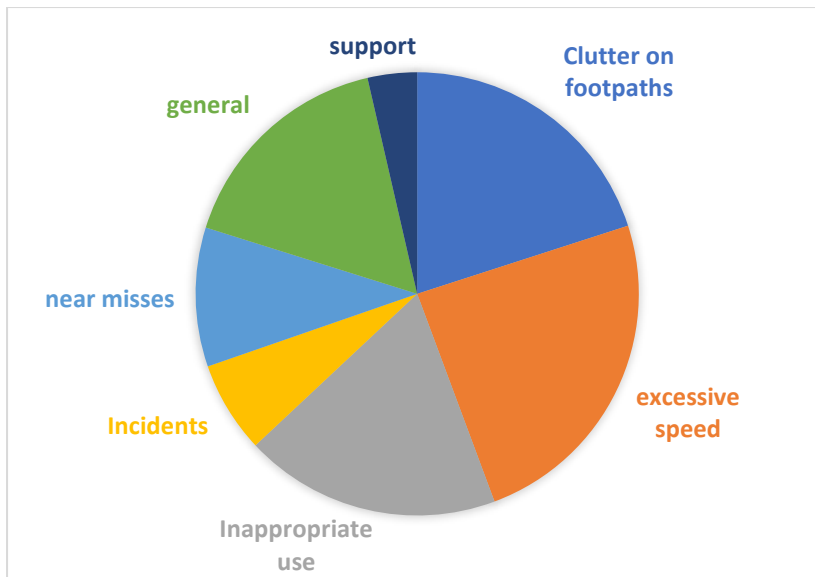
- the pricing to be applied by operators to riders
- the operator's service area within the Brisbane LGA
- where e-scooters are to be placed for hire
- innovation in product or promotional activities (although tenderers proposed innovation roadmaps were considered as part of the competitive tender evaluation).

There was no performance bonus or abatement regime applied to the fees that operators paid to Council. The ultimate regulatory tool in the case of operator poor performance, cooperation with Council and negative community feedback was the termination of the operating agreement, requiring the operator to cease operations.

These operating agreements provided for a focus on community safety outcomes, rather than economic regulation, which was considered unnecessary given the competitive environment that was created by Council. The outcomes of this approach are highlighted in the next section.

#### **4. Managing Community Concerns**

The arrival of the e-scooters in Brisbane at the end of 2018 generated some community criticism with the main criticism being speed, clutter on footpaths and inappropriate use as shown in Figure 2. Inappropriate use included lack of wearing of helmets or bad behaviour on devices.



**Figure 2: Classification of Complaint Content (Brisbane Infrastructure Database December 2019)**

The numbers of complaints were also monitored over time. These numbers did not increase, even with the greater number of e-scooters in the city.

## 5. The Administration of Operating Agreements

The regulation of e-scooters endeavoured to address these concerns as far as Council’s jurisdiction allowed it. Council’s powers only extended to the parking of devices and use through city malls. All other powers regarding usage of PMDs (helmets, speed, behaviour) falls under State legislation. Therefore, administration of the operating agreements covered:

- The parking of devices with compliance to:
  - Numbers of e-scooter parked in any one location
  - Distance parked from the kerb
  - Minimum width of footpath being clear
  - Ensuring that braille trails on footpaths are not obstructed
  - Ensuring access points to emergency infrastructure, inspection holes and chambers, and on-site fire hydrant points.
- Provision of courtesy helmets to support users to comply with the compulsory helmet legislation.
- Geofencing solutions to safely speed limit e-scooters where directed and to support no-ride and no-park zones.
- Data provision (broadly using the data specification used for the operating agreements in the City of Auckland)
- Incident reports.

Council’s Compliance and Regulatory Services (CaRS) team monitored e-scooter compliance on a daily basis and reported on compliance of both company and rider placement. This was reported back to Transport for Brisbane, the division within Council that manages the operating agreements, and the e-scooter hire operators. Although no penalty arrangement applied, audit results and reports of non-compliance were reported back to the e-scooter operators at monthly meetings and strategies to improve compliance were discussed. Ridership and incident data were also discussed at these meetings.

Operators also formulated agreements with other entities such as the South Bank Corporation (the entity responsible for administering the South Bank Parklands) and with the Queensland University of Technology, and more recently, the University of Queensland.

With respect to State Government involvement in education and enforcement, Council acknowledges that the Queensland Government, assisted by Council, ran a “No Go” rideables campaign in April 2019 in the Brisbane CBD. The campaign reminded users to give way to pedestrians, wear a helmet and not ride on CBD roads, main roads or bike lanes.

## **5.1 Market Competition**

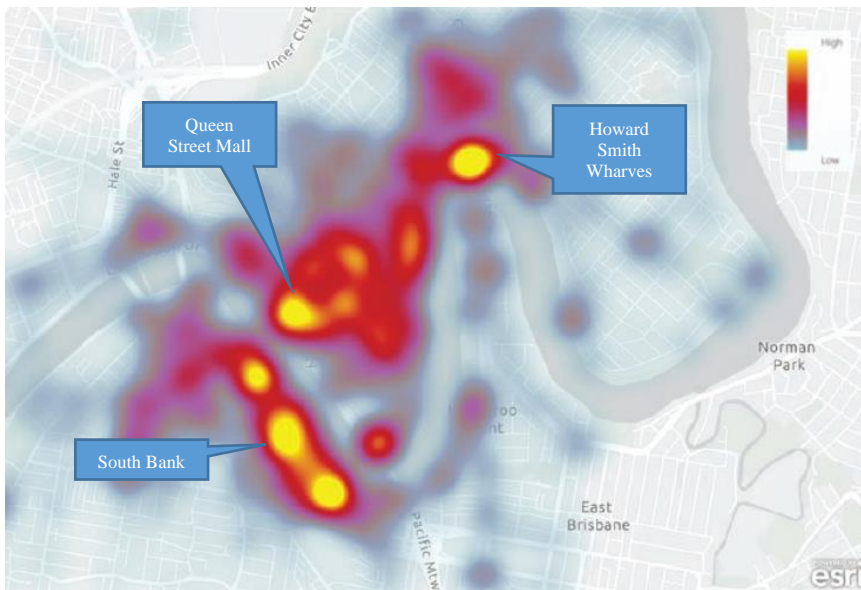
A key question was whether the appointment of two operators in Brisbane provided sufficient competitive tension in the market to control prices and deliver innovation. In Council’s review at the end of the first year of the operating agreements, it was concluded that this was successful. Key features of observed competitive behaviour included:

- Prices stayed competitive between the two operators with discounts, loyalty programs and subscriptions offered to riders. During the coronavirus pandemic in 2020, although one operator decided to cease operations, the competitor offered free rides for healthcare workers.
- There was innovation by both operators, which included:
  - one operator upgrading its fleet to newer generation e-scooters, featuring increased wheel size on e-scooters to improve stability, improvements in positioning systems to ensure improved management and regulation of e-scooters.
  - both operators introducing helmet locks on their e-scooters to ensure helmets are available for riders.
  - one operator introducing topple detection and an emergency button feature which detects accidents and helps riders call the emergency services.

At the same time, e-scooters and other e-mobility devices were becoming more available from retailers. Although the quantity of privately owned e-mobility devices has not been able to be quantified, anecdotal evidence is that the overall volume of private devices operating in the city would now exceed that of the shared schemes.

## **6. The need for a new approach**

The lack of commercial regulation resulted in a concentration of e-scooters where demand was highest, concentrated primarily around entertainment centres in the inner city, namely South Bank, the Queen Street Mall and Howard Smith Wharves (see Figure 1).



**Figure 3: Primary Activity Areas of e-scooters (Source: Brisbane City Council)**

Previously in 2011, Council had launched a public bicycle hire scheme in partnership with JCDecaux called CityCycle. This scheme consisted of 2000 bicycles stationed at 150 docking stations in key inner city locations. Since the introduction of e-scooters, CityCycle patronage declined, reflecting in part public substitution for a more modern form of mobility. The success of e-scooters in Brisbane and the technological advances in the micro-mobility industry prompted Council to investigate options to deliver electric bicycles to the Brisbane community.

In December 2020, Council decided to:

- Terminate the CityCycle scheme
- Terminate the existing e-scooter operating agreements, and
- Undertake a market exercise to enter into new operating agreements for e-bikes and e-scooters.

To allow for a smooth transition, the current CityCycle scheme is being phased out throughout 2021 and the new e-scooter and e-bike operating agreements commenced in July 2021.

## **7. An e-mobility strategy**

To provide guidance to the formulation of the new operating agreements, and the development of this fast-growing form of transport, Council considered that an e-mobility strategy was required. This would take its starting point from the Transport Plan for Brisbane which had been launched the previous year.

### **7.1 Transport Plan for Brisbane**

The Transport Plan for Brisbane (2019) (TP4B) guides the evolution of our city's transport network over the next 25 years. Key outcomes of the TP4B include:

- The design and operation of transport networks minimise impacts on the environment and help mitigate the impacts of climate change
- Brisbane residents have improved health and wellbeing through greater use of walking and cycling to access work, education services and for recreation.

- The transport network meets the needs of all users for personal, goods and service movements by providing equitable, affordable and accessible transport options
- Travelling around Brisbane is easy, safe and enjoyable for all.
- Our transport systems help Brisbane and SEQ business and industry to grow and prosper
- Travel to work options meet commuters' needs with increased use of public and active transport for commuter travel.
- A safe, fit-for-purpose and integrated freight transport network that provides for the efficient movement of goods to, from and within the city.
- Transport services, infrastructure and information help to attract more visitors to Brisbane and make their stay enjoyable.
- Planning, design and management of our transport systems are robust, responsive and adaptive to future opportunities and changes.
- The strategic use of technology improves the efficiency and effectiveness of Brisbane's transport networks and services.
- Transport authorities and stakeholders in Brisbane are responsive and work together effectively and collaboratively to be well-placed to anticipate and respond to change.
- Our transport systems and land uses work together to ensure both function effectively.
- Brisbane's transport networks meet projected population and employment needs and are designed to optimise effectiveness and performance of the network.
- Travel demand and behaviours of the community and businesses will improve transport network efficiency and reduce costs
- Brisbane's transport networks provide for the safe movement of people, goods and services.

In the implementation Plan of the TP4B, Implementation No. 3 is e-wheeling (later termed e-mobility). Greater take-up of e-wheeled devices was seen in the TP4B as a means to increase utilisation of bikeways and shared paths, provide health and wellbeing benefits and help to reduce greenhouse gas emissions, therefore achieving a number of the above outcomes. Key parts of the scope to develop e-wheeling under the Plan are:

- Monitor the emerging trends in e-wheeling and personal mobility devices.
- Incorporate provision for e-wheeling in the planning and design of the bikeway and shared path network.
- Work with employers, retailers and other organisations to encourage provision of safe and secure storage and charging facilities.
- Monitor safety and engage and educate the community regarding appropriate behaviour and conduct on pathways.

## **7.2 Policy Principles of the Strategy**

The e-mobility strategy was built around the following five policy principles:

**Safety** – keeping users and the public safe. The risk of incidents and crashes is minimised and the community has confidence in the safety of e-mobility devices, the users and of others.

**Accessibility** – enabling as many people as possible to take part in e-mobility. Coverage of sharing schemes reaches as many people as possible. E-mobility options have potential to complement the role of public transport and provide short distance transport options within

communities so people can conveniently access local services, creating opportunities for local businesses.

**Mobility** – maximising the number of travel choices for all users of different ages and abilities. The convenience and flexibility of e-mobility devices provides a more attractive travel option than private vehicles.

**Agility** – being ready to respond to rapid technological change. The infancy of the industry and rapid technological change requires regulation and infrastructure provision that is adaptable to rapidly changing circumstances.

**Infrastructure** – delivering infrastructure which supports e-mobility. Supporting e-mobility sharing schemes with appropriate infrastructure will improve safety and public confidence in e-mobility.

Under each of these principles a set of strategic directions were articulated. The strategic directions as finalized are shown in Appendix 1.

## 8. Community views on the strategy

During the preparation of the strategy an on-line community consultation process was undertaken between November 2020 and February 2021. The consultation was primarily through an online survey, although written submissions were also invited. Stakeholder agencies such as the Queensland Department of Transport and Main Roads, RACQ, Bicycle Queensland and Queensland Walks provided formal submissions. Over 900 responses were collected.

The survey consisted of the following questions:

1. Which group(s) do you identify with?
2. What suburb are you located in?
3. What is your overall level of support for the directions in the draft strategy?
4. To what extent do you agree or disagree with the proposed directions for each of the Outcomes.
5. Which of the proposed directions are most important to you (under each outcome). This provided a ranking of strategic directions in order of importance.

Finally, general comments were invited under each of the key policy principles. A summary of responses are shown in Appendix 2.

Respondents were generally in favour of the draft strategy and welcoming of the proposed directions. However, respondents felt the draft strategy did not adequately address safety issues or the need for adequate infrastructure and did not consider privately owned e-mobility devices.

Safety was the primary concern for respondents, particularly:

- the speed at which e-mobility devices can travel
- the lack of suitable parking creating a hazard
- inconsistencies with all users (pedestrians and e-mobility users alike) obeying applicable road rules and observing shared pathway etiquette.

People did not see that mandatory caps were an effective way to manage the numbers of e-mobility devices due to the growth in privately owned devices.



Respondents thought that the current standard of infrastructure is not sufficient for the current use of e-mobility devices or to encourage people to use e-mobility devices. Key issues included:

- A need for infrastructure which separates pedestrians and e-mobility device users.
- Any expansion beyond the inner city needs to consider what infrastructure is required to improve safety outcomes.
- It is particularly important to provide greater service integration to assist in first and last mile travel especially connecting to public transport.

## 9. Additional Safety Research

At the time of the draft strategy being issued for comment, there was no Australian based research on the safety of e-scooters, and overseas research was inconclusive due to the range of individual jurisdictional laws governing e-scooters. For instance, US hospitals appeared to report a much larger incidence of head injuries due to the lack of helmet legislation. The Organisation for Economic Co-operation and Development (OECD) concluded that the risk of an emergency department visit for an e-scooter rider is similar to that for cyclists. However, there is some dispute about these conclusions.

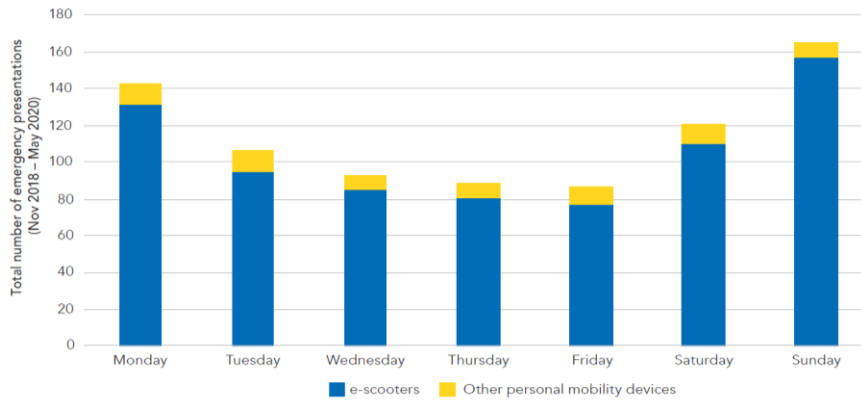
In the last two years there has been a growing body of research gathered in Brisbane on the safety of e-mobility devices since the introduction of e-scooters. Of the confirmed e-mobility injuries presented at Brisbane hospitals, 92% related to e-scooters<sup>1</sup>, and of those, 78% were related to sharing scheme e-scooters with most people presenting to emergency departments on a weekend or a Monday between the hours of 6pm and 12 midnight<sup>2</sup>. A separate study found that 46% of injured people were riding without a helmet and alcohol was involved in 27% of cases.

These issues highlight the importance of an improved safety strategy including rider education on safe use of e-mobility devices, injury surveillance and enforcement of rules. It is noted that manufacturers of e-mobility devices have demonstrated commitment to safety with design improvements, such as increasing the wheel size on e-scooters to improve stability and introducing Internet of Things (IOT) technologies to monitor and provide feedback to riders and to the sharing scheme operator on particular rider behaviour. The insurance industry is also developing third party insurance products for e-scooter sharing scheme operators and for e-scooter users.

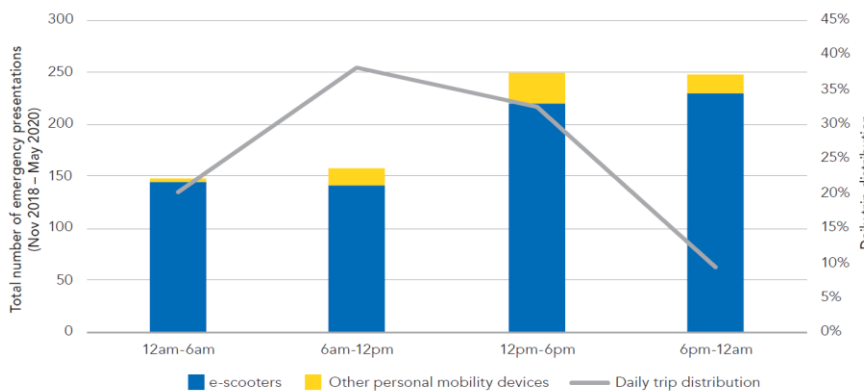
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<sup>1</sup> Input has been provided by representatives from the following organisations: Jamieson Trauma Institute; Royal Brisbane and Women's Hospital; Princess Alexandra Hospital; Royal Australasian College of Surgeons, Queensland Trauma Committee; Queensland Injury Surveillance Unit (QISU); Queensland University of Technology; University of Queensland

<sup>2</sup> Emergency presentations at hospitals may not reflect the true number of incidents/injuries as presentations to other health services (such as GPs) are not included, minor incidents not requiring medical treatment are not captured and relevant incidents may not have been adequately recorded in the Emergency Department documentation



**Figure 4: Emergency presentations at Brisbane hospitals by day of week**



**Figure 4: Emergency presentations at Brisbane hospitals by time of day (Source: Brisbane City Council and Jamieson Trauma Institute)**

## 10. Conclusions – The Way Forward

Brisbane City Council has awarded operating agreements for e-scooter and e-bike shared schemes to two operators, Neuron Mobility (Australia) Pty Ltd and Beam Mobility Australia Pty Ltd, which will commence in July 2021. The principles on which these arrangements are based are drawn from the e-mobility strategy. Due to the rapid advances in this sector, the e-mobility strategy has been set over two years 2021-2023.

The e-mobility revolution is continuing with the introduction of many other types of devices and this volume is now estimated to be as large as or larger than the hire schemes that have spurred the revolution in the first place.

Brisbane City Council recognises that infrastructure will have to change to address the issue of conflict between e-mobility devices and pedestrians. For this reason, it has ensured that the CityLink Cycleway trial for a dedicated cycleway through the Brisbane CBD is suitable for e-mobility devices, and other opportunities are being explored in infrastructure development to get the adequate separation between pedestrians and higher speed e-mobility and micro-mobility devices. Furthermore, the greater number of e-mobility devices requires dedicated parking spaces and Council will be rolling out dedicated e-mobility parking sites in the near future in cooperation with the operators.

Council will be continuing to engage the community on e-mobility and foster further research on rider behaviour and compliance to identify further actions to reduce the crash rate.

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## **Appendix 1: Brisbane E-mobility Strategic Directions**

### **Safety**

**Outcome:** Private and public agencies are responsive and work together effectively to improve safety and ensure public confidence in e-mobility

#### **Directions:**

- Where possible, limit speeds in high pedestrianised areas and shared zones through use of GPS and IOT speed limiting technology
- Consider periods of restricted operations for sharing schemes to reduce the rider injury rate
- Advocate for and participate in a state-wide safety program for e-mobility
- Continue to advocate with the Queensland Government and the Queensland Police Service (QPS) for stronger enforcement of helmet usage and safe riding in areas of high pedestrian presence.
- Work with QPS, medical research institutes and TMR to further research rider behaviour and compliance and map out actions to further reduce the crash rate.
- Require sharing scheme operators to carry third party insurance as part of their operating agreement and encourage owners of e-mobility devices to also carry third party insurance.
- Require sharing scheme operators to routinely share injury and crash data as part of their operating agreements with Council.

### **Accessibility**

**Outcome:** E-mobility devices are widely used in Brisbane, helping to connect communities with local services

#### **Directions:**

- Encourage scheme operators to offer alternate scheme access, reduced pricing and other incentives to low-income earners or disadvantaged communities
- Undertake consultation with disability user groups on the impacts of e-mobility
- Work with providers of e-scooter and e-bike hire schemes to investigate how services could be expanded to a neighbourhood transportation system
- Investigate how these services may complement and expand on existing PPT and DRT services.

### **Mobility**

**Outcome:** Transport services and infrastructure help to enable e-mobility as a replacement for short car trips, especially for first and last mile to public transport.

#### **Directions:**

- Encourage the extension of scheme operations into areas outside of the CBD with low car ownership and/or connections to public transport to encourage first-and-last mile travel

- Maintain a mandatory cap within the inner city, but review in relation to growing demand
- Investigate alternatives to caps for e-scooters and e-bikes citywide
- Work with TMR, TransLink and the sharing scheme operators in the provision of adequate facilities for first-and-last mile trials on the South East Busway.
- Seek opportunities for shared scheme operators to participate in first-and-last mile trials.

## **Agility**

**Outcome:** Technology improves the efficiency and effectiveness of e-mobility, creating flexibility across Brisbane's transport networks and services.

### **Directions:**

- Review duration of operating agreements in line with other similar jurisdictions
- Partner with trial sites in the facilitation of shared e-mobility participation in MaaS
- Encourage shared scheme operators to participate in MaaS trials
- Adopt the MDS to ensure all e-bike and e-scooter operators report consistent data.

## **Infrastructure**

**Outcome:** Our transport infrastructure helps to improve safety and public confidence and helps the e-mobility industry to grow.

### **Directions:**

- Continue evaluation of the CityLink cycleway trial and similar infrastructure developments including usage by e-mobility devices, crash data and its success in removing e-mobility devices from the surrounding footpaths.
- Continue to facilitate sharing scheme operators in improving GPS and other IOT technologies.
- Develop a plan for rolling out designated shared scheme parking areas across the inner city.
- Incentivise sharing scheme providers to encourage their customers to park in designated parking zones.
- Consider potential contributions from scheme operators for the development of supporting infrastructure.
- Consider any necessary additional charging facilities, whether private or public, through a review of provisions in the Brisbane City Plan 2014 or possible direct investment in charging infrastructure as the market calls for it.

## Appendix 2: Feedback

<p>General comments on the strategy</p>
<ul style="list-style-type: none"> <li>• Respondents were generally welcoming of the development of Council’s e-mobility strategy.</li> <li>• Some participants called for the banning of e-mobility devices, particularly e-scooters.</li> <li>• However, most recognised this was no longer possible given their prevalence and a better option was to manage how they are used to ensure people’s safety.</li> <li>• The strategy focuses too much on shared e-mobility and neglects privately owned devices.</li> </ul>
<p>General issues with Outcome 1: Safety</p>
<ul style="list-style-type: none"> <li>• The strategy is too focused on e-mobility device users and does not sufficiently consider safety for other road-users, especially pedestrians.</li> <li>• Safety is reliant on all users obeying applicable road rules and observing shared pathway etiquette.</li> <li>• The speed users can travel on e-mobility devices is too high and poses a safety risk.</li> <li>• The parking of e-mobility devices results in clutter on the footpath and pose a safety risk.</li> </ul>
<p>Suggested improvements for Outcome 1: Safety</p>
<ul style="list-style-type: none"> <li>• Re-evaluate the speed at which e-mobility devices can travel especially around heavily pedestrianised areas.</li> <li>• There is a need to provide adequate infrastructure for e-mobility devices to separate them from vulnerable road users e.g. pedestrians to ensure their safety.</li> <li>• Greater enforcement is needed to ensure safety.</li> <li>• Council should provide designated parking for e-mobility devices.</li> </ul>
<p>General issues with Outcome 2: Accessibility</p>
<ul style="list-style-type: none"> <li>• E-mobility devices are a cheap and easy way to travel the first-and-last mile between public transport and the end of origin/final destination.</li> <li>• There is demand for the use of e-mobility devices beyond the inner city but needs to be accompanied by the provision of adequate infrastructure and dealing with issues such as device parking.</li> <li>• The growth of privately owned devices is an important consideration in ensuring accessibility and any strategy needs to take this into account.</li> </ul>
<p>Suggested improvements for Outcome 2: Accessibility</p>
<ul style="list-style-type: none"> <li>• Ensure any scheme offers a range of services/products which encourage people from disadvantaged communities to use e-mobility devices. For example, this includes offering a variety of types of e-bikes and pricing schemes.</li> <li>• Allow types of e-mobility devices on public transport.</li> <li>• Provide appropriate infrastructure in areas where e-mobility devices are used.</li> </ul>
<p>General issues with Outcome 3: Mobility</p>
<ul style="list-style-type: none"> <li>• Mandatory caps are not an effective tool as they do not account for the use of privately owned devices and do not apply to other types of vehicles e.g. cars, and limit a person’s choice if they wish to use an e-mobility device and they are unavailable.</li> <li>• The use of e-mobility devices for first-and-last mile travel, especially to public transport, is beneficial, but needs to be accompanied by the provision of adequate infrastructure to get to stations and at the stations themselves.</li> </ul>