

# Regulations and safety for electric bicycles and other low-powered vehicles

Full report: [www.nzta.govt.nz/resources/research/reports/621](http://www.nzta.govt.nz/resources/research/reports/621)

## Making the most of low-powered vehicles

**Regulations are needed for electric bikes (e-bikes) and other low-powered vehicles in New Zealand, to ensure their significant potential health benefits are not offset by safety concerns.**

The use of e-bikes and other low-powered vehicles is on the rise, within New Zealand and internationally, bringing with them health, social and environmental benefits.

Technological advances and lower prices are making e-bikes, mobility scooters, Segways, self-balancing devices, e-skateboards and e-scooters increasingly popular and common on New Zealand roads and footpaths. Market analysis suggests that e-bike sales alone will continue to climb rapidly, with over 35,000 (and potentially as many as 65,000) sales predicted for 2026 (compared with 13,000 in 2016).

Unlike most other countries, however, New Zealand does not limit the maximum motor-assisted speed that low-powered vehicles can travel. With technological advances increasingly blurring the lines between conventional and low-powered motor vehicles, the need for regulations to categorise low-powered vehicles, and set safety and usage constraints for them has become apparent.

Research by ViaStrada has looked at international approaches and local concerns to assess the various regulatory and non-regulatory options for improving the safety of low-powered vehicles, while at the same time supporting technological innovation and attractiveness of low-powered vehicles as a travel option in New Zealand.

### Low-powered vehicle use in New Zealand

The research focused on electric-powered devices with a continuous power rating of no more than 2,000 W. Such devices may or may not include means of human propulsion.

In New Zealand, these vehicles fall into one of the following classes:

- power-assisted pedal cycles (bicycle-style e-bikes)
- mopeds, including motor scooters with a maximum speed of 50 km/h and low-powered scooters (also known as power cycles or scooter-style e-bikes with pedals)
- wheeled recreational devices, which may have a motor of no more than 300 W
- mobility devices, including power chairs and mobility scooters, which may have a motor up to 1,500 W

- devices or vehicles with power above 300 W and up to 600 W, officially declared to not be a motor vehicle.

Some of the vehicles reviewed in the research do not fall into any existing class of vehicle regulated in New Zealand.

A full consideration of the potential benefits of these vehicles was beyond the scope of the research. However, a scan of studies conducted overseas established that such devices can have economic, environmental and personal health benefits, require less road space and consume less fossil fuels, than more traditional vehicle modes.

A safety analysis of low-powered vehicles, conducted as part of the research, returned inconclusive results. Consultation with stakeholders also revealed a wide range of often conflicting views on safety-related matters, such as whether devices should be ridden on footpaths or



allowed throttles. Although many manufacturers included features in their vehicles to improve their safety, users could often over-ride these by tampering with their motors, sensors or software, or using more powerful batteries.

Internationally, safety-related research has focused on e-bikes, which have both increased safety risks and safety benefits associated with their use when compared with unpowered bicycles. The higher average speeds and typically greater mass of e-bikes may increase the likelihood and injury severity of crashes. On the other hand, e-bikes helped address many barriers to cycling and therefore are likely to support the 'safety in numbers' effect. If e-bikes replace car trips, then they may reduce the social cost of crashes as they cause less damage and injury to others than motor vehicles.

Of the other low-powered vehicles, data showed that mobility scooters had the highest involvement in fatal crashes, although most non-fatal incidents involving mobility scooters were falls or collisions with stationary objects, rather than collisions with motor vehicles. Safety data for the other low-powered vehicles was scant. Modelling of crashes between self-balancing scooters and cars indicated a reduced injury severity compared with crashes between pedestrians and cars.

### Regulatory options

The research looked at the various regulatory approaches used overseas to suggest a suitable approach for New Zealand, including the potential classes and rules that could be introduced.

In their report, the researchers conclude, 'The degree and nature of existing legislation varies greatly between the different devices and different countries. Aligning New Zealand legislation with that of other countries will clarify rules for the industry, the public, regulators and the police. Australia and the UK are generally adopting the EU standard for e-bikes, but we could also adopt a framework that comprises the most appropriate components from various overseas rules. As no reviewed countries have rules covering the full range of other low-powered vehicles, the pros and cons outlined in this report may serve as a basis to create a regulatory framework that simplifies the process of approving or rejecting new low-powered vehicles.'

The three main criteria suggested by the researchers as a basis for future classification of low-powered vehicles in New Zealand were:

- maximum continuous power output – this was considered a useful regulatory criterion to:
  - differentiate low-powered vehicles from other motor vehicle classes

- limit acceleration to a level compatible with other path and cycle lane users
- reduce the incentive for owners to tamper with speed restrictions set in the vehicle's system
- ensure high-power and weight systems are not fitted to bicycles that are not designed to cope with such additions
- maximum power-assisted speed – this criterion was referred to in the legislation of all the other countries reviewed; three maximum motor-assisted speeds commonly used overseas were assessed for e-bikes (25, 32 and 45 km/h), and for other low-powered vehicles (10, 15 and 25 km/h)
- throttles – throttles were one of the most contested components of low-powered vehicles. Their inclusion was considered to increase the safety risks and reduce the health benefits associated with use of these vehicles. The researchers noted, while most major e-bike brands are now moving away from including throttles in their systems, there is some concern that prohibiting throttles may increase the average costs of e-bikes and therefore reduce their uptake and the potential safety-in-numbers effect from their more prevalent use.

The research report sets out an indicative regulatory framework for low-powered vehicles in New Zealand, based on the international experience. In summary this framework recommends:

- including any low-powered vehicles intended for or primarily used by mobility impaired users within the definition of a mobility device
- classifying e-bikes and other low-powered vehicles based on their speed capability
- setting a maximum power-assisted speed and size for vehicles using footpaths
- relaxing the maximum power limits for e-bikes and other low-powered vehicles designed for road use
- introducing minimum age limits and driver licensing for higher speed e-bikes and low-powered vehicles
- using existing road user rules to promote user behaviours that minimise conflict with existing path users.

The authors recommend that the next step could be to consider the proposed framework, and issues and recommendations included in the research report, as a basis for developing government policy on low-powered vehicle use in New Zealand. This policy-making exercise could then be followed by rule making.