Inquiry into e-mobility safety and use in Queensland

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QLD Parliamentary Submission on E-Mobility Safety and Regulation

Prepared for: State Development, Infrastructure and Works Committee

Inquiry: E-Mobility Safety and Use in Queensland

Submission Date: 18/6/2025

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EXECUTIVE SUMMARY

This submission raises urgent safety concerns regarding the growing use of electric bicycles (e-bikes) and e-scooters in Queensland. It focuses on three core areas:

- Biomechanical risk from high-speed impacts involving e-bikes and e-scooters (e-mobility devices);

- Gaps in enforcement of current speed/power regulations, allowing illegal devices to proliferate;

- Escalating trauma and fatality trends, particularly involving youth and pedestrians.

The submission includes data-backed kinetic energy tables, trauma reports, and biomechanical injury models, and provides official reference links to support all claims.

SECTION 1 – CURRENT REGULATORY LANDSCAPE

This section outlines the current legal classifications and enforcement challenges surrounding electric bicycles and other emerging e-mobility devices in Queensland.

Queensland law distinguishes between:

- Power-Assisted Bicycles (PABs): Must use pedal assistance, comply with EN15194, max 250W continuous output, and cut off motor support at 25 km/h.

- Motorised Bicycles: Exceeding 250W or operating throttle-only. Classified as motor vehicles.

Devices not complying with these standards are illegal but are widely available through online and retail channels, many exceeding 45–60 km/h in real-world conditions.

E-Mobility Device Classification:

Beyond e-bikes, a wide range of e-mobility devices — including modified scooters, mono-wheels, and hybrid e-skateboards — blur regulatory definitions. Many of these exceed legal power or speed limits, operate without mandatory compliance checks, and are sold as 'off-road' or 'recreational' to evade enforcement. These devices can pose equivalent kinetic and trauma risks and require inclusion in updated regulatory frameworks.

SECTION 2 – KINETIC ENERGY AND INJURY RISK

Kinetic energy calculations for e-bikes and other e-mobility devices show injury potential equivalent to car collisions at 25–60 km/h.

Speed (km/h)	KE (J) (28kg+62kg)	KE (J) | (38kg+62kg)	Car Impact Equivalent	Injury Outcome
25	| 2,167	| 2,408	| 25 km/h	| Minor injury threshold
35	| 4,251	| 4,724	| 35 km/h	| Severe trauma likely
60	| 12,505	| 13,894	| 60 km/h	| Likely fatality

These figures reflect the kinetic energy of moderate to high-mass e-bikes and comparable e-mobility configurations (e.g., modified scooters), reinforcing their potential to inflict trauma at velocities previously associated only with motor vehicles. The +62kg represents an average QLD male aged 17.

Sources: WHO (2021), Transport for NSW, MUARC, NRMA CrashLab.

SECTION 3 – BIOMECHANICAL COLLISION RISKS

This section details the biomechanical trauma associated with full-frontal collisions involving e-bikes and comparable e-mobility devices.

A full-frontal collision between an e-bike and a pedestrian (groin-first) can result in catastrophic trauma:

- Narrow tyres concentrate force (13.6 MPa at 50 km/h);

- Sequential trauma from tyre, frame, handlebars, rider body;

- Internal injury risk: pelvic ring fractures, femoral artery tears, spinal compression.

E-Mobility Device Narrow Profiles:

Many e-mobility devices — especially scooters and mono-wheels — feature even narrower tyres and frames than e-bikes. This concentrated contact profile intensifies localized pressure during impact, resulting in similar or worse trauma outcomes.

SECTION 4 – TRAUMA TRENDS AND EMERGENCY BURDEN

Queensland-specific data (2023–2024):

- 1,273 e-scooter ED presentations

- 8 confirmed e-mobility deaths

- 635% increase in Gold Coast hospital presentations since 2019

- Over 50% of e-scooter injuries involve head/face trauma

Australia-wide insights:

- Royal Melbourne: $1.9M/year e-scooter hospitalisation costs

- Sydney Children's: 64 paediatric injuries in 2024

SECTION 5 – POLICY RECOMMENDATIONS

The core danger — the "killer" — in high-speed e-mobility incidents is uncontrolled kinetic energy, driven by excess speed, illegal power output, and unregulated device configurations.

To manage this killer and reduce the mayhem, Queensland must clearly distinguish between:

Tier 1 – Unregistered Personal Mobility Devices

Do not exceed 25 km/h assisted speed and 35 kg total weight. Allowed in public areas under light-touch rules.

Tier 2 – High-Powered or Heavier Devices

Exceeding 25 km/h or 35 kg. Must be registered, insured, and licenced as motor vehicles.

1. Speed and Weight Caps Aligned with Global Norms

2. Mandatory kinetic energy warning labels

3. Prohibit sale of non-certified kits

4. Age limits and competency testing

5. Queensland-based injury tracking

6. Local public safety campaign

REFERENCES

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NIOSH/OSHA Pressure Injury Thresholds
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