Amending the definition of Power Assisted Pedal Cycles to allow more powerful, yet safer, versions be used in Australia

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Presented by Dan Leavy
Summary

• Background
• Rational
• Methodology
• Outcomes
• Future directions
Background

• Growing demand for smaller & greener vehicles saw increase in PAPC usage
• 2005, RTA review
• 2008, Issue Paper
• 2008, Workshop with stakeholders
• Retain current arrangement but review standards
Previous Requirements

• ADR definition
  “A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts”
  – Unchanged since 1984
  – Developed late ’70s

• Basis for all legislation
  – ARR
  – Local road rules, licensing & registration requirements
Examples
Problems

- **ADR definition for bicycle**
  
  “A vehicle designed to be propelled through a mechanism solely by human power”

- **Substitute into definition for PAPC**
  
  “A [vehicle designed to be propelled through a mechanism solely by human power] to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts”

- **Case history**
Problems (contd)

Market for non bona fide PAPCs

– non-functioning pedals or even no pedals at all
– motor used independently
– ergonomics
– size of motor
Rationale and Research Methods

• Need to retain characteristics of standards bicycles
• Retain distinction from mopeds
• In depth, desktop research
• Range of dynamic road tests
• Laboratory assessment
Risk & Controls

- PAPCs must duplicate the performance of standards pedal cycles
- Pedal to activate
- Speed
- Power
- Kinetic energy
- Brakes
- Ergonomics and components
Basis of modelling

• Speed an average club cyclist can maintain
• Equivalent power output
• Fixed values
  – weight of the rider
  – wind resistance
  – friction
• Variables
  – gradient
  – rider profile
  – weight of the bicycle
# Overseas’ Requirements

*From this speed the motor does not help propelling the pedal cycle and the rider must provide all the power

**Although maximum power output is not specified, no models were over 250 watts

***Minimum speed to obtain assistance is 3km/h if no on/off switch is available

<table>
<thead>
<tr>
<th>Country</th>
<th>Need to pedal</th>
<th>Max power output</th>
<th>Power reduction</th>
<th>Max assisted speed*</th>
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<td>250**</td>
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<tr>
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<td>X</td>
<td>750</td>
<td>X</td>
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</tbody>
</table>
EN 15194

- EN 15194 Cycles - Electrically power assisted cycles - EPAC Bicycles
- Aligning with EN 15194 meant
  - Sold without restrictions
  - Conformity marking
  - Readily assessed
  - Export opportunities
- Weight
- Variation on power measurement
- Pedal Vs throttle
Summary

• Maximum continuous power output of the motor limited to 250 watts
• Power measured at the wheel
• Rider must pedal for the motor to activate
• Motor must cut out at 25km/h or sooner if the rider stops pedalling
• May incorporate a low-speed start up
• EN 15149 deemed-to-comply standard
Outcomes

- Findings and support paper, May 2009
- Workshop August 2009
- Papers to DIT & NTC March 2010
- ADR amended May 2012 by allowing EN 15194 as an alternative
The definition of *power assisted pedal cycle* now reads:

“A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts; or a ‘Pedalec’”;

and *Pedalec* is, in turn, is defined as:

Current Status

• ARR part of 10th Amendment package

• Vic & NSW in 2012

• Qld & ACT in 2013
Examples
Enforcement

• The need to pedal to activate the motor is unambiguous – if a person is not pedalling but the motor is operating the vehicle is not a pedalec

• The power output at the wheel can be measured reasonably easily by a dynamometer

• Labelling
Motorised Bicycles

- Legal
  - Old-type PAPC
  - Pedalec
  - Moped
- Illegal
  - Petrol-driven
Future Direction

• Definition – phase out old definition
• Design standards – introduce an Australian version of EN 15194
• Consumer law – have EN 15194 included in CPN 6
• Sales – trends in PAPCs sales
Thank you

• Questions

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