

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

Dan Leavy & Gabriel Denoury
Centre for Road Safety, Transport for NSW

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

Country	Need to pedal	Max power output	Power reduction	Max assisted speed*
Aus	X	200	X	None
NZ	X	250	X	None
Eu	✓	250**	✓	25
Jpn	✓	250	✓	24
Can	X***	500	X	None
US	X	750	X	None

- *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

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

ADR definition

- 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:

“A vehicle meeting European Committee for Standardization EN 15194:2009 or EN 15194:2009+A1:2011 Cycles - Electrically power assisted cycles - EPAC Bicycles.”

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

Dan Leavy

Manager, Safer Vehicles

Centre for Road Safety

Transport for NSW