Speed pedelec rider’s behaviour as input for appropriate legislation

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Who am I?

- Researcher on speed pedelecs @ KU Leuven since 2012
- Advising Flemish, Belgian and EU government on LEV legislation
- Member of Scientists for Cycling network
- Board member of LEVA-EU
What do we know about the speed pedelec?
Belgian commuters do buy it

• Sales numbers show clear interest
  • 2041 registered in 2016
  • Over 6 700 registered in 2017 (⇔ 2 713 electric cars)

→ Offers alternative for car commuting
Typically used for commuting

![Bar chart showing commuting distances](image)

Social advantages

Hours lost in traffic

Global Temperatures

Legend:
- Bicycle
- Powered cycle
- Moped type A
- Moped type B
- Speed pedelec
- Motorcycle
- E-skateboard
- Segway
- Hoverboard
- E-step
- Monowheel
- Car

Energy [Wh]

Eklim
Ewind
Eacc
Erol

Temperature Anomaly (°C)

Annual Average
Five Year Average

Personal advantages

• Commuting time competitive with car commuting or public transport
• Low variation in commuting time
• Cost
• Sport
• Fun
• …
What is the typical speed of a speed pedelec user?
Cruising speed of speed pedelec users

Cruising speed of speed pedelec users
Cruising speed of speed pedelec users
What about legislation?
Bike lane users in Belgium

- Pedestrians
- Bicycles
- Mopeds (in some cases)
Original difference
~ 1995: Introduction traditional electric bike

- Pedal assistance
- Maximum assistance speed $\leq$ 25 km/h
- Max. cont. rated motor power $\leq$ 250 W
~ 1995: Introduction traditional electric bike

Belgian bicycles sales in 2017

- 45% Non-electric
- 55% Electric
~ 2013: Introduction speed pedelec

- Mainly pedal assistance
- Maximum assistance speed \( \leq 45 \text{ km/h} \)
- Max. cont. rated motor power \( \leq 4000 \text{ W} \)
  (typically 350 W or 500 W)
Moped type
Belgian legislator
Speed pedelec
Belgian legislator

Moped type
Speed pedelec
Moped type
Belgian legislator
Speed pedelec
The speed pedelec in Belgium

If speed limit ≤ 50 km/h

If speed limit > 50 km/h
The speed pedelec in Belgium

If speed limit ≤ 50 km/h

If speed limit > 50 km/h

Choice for road authority

- D7
- D9
- D10
- VERBODEN
- VERPLICHT
- F59c
Is this legislation future proof?
Walking pace

Faster than walking pace

(Belgian traffic legislation)
Future

- More innovations in Light Electric Vehicles
  - More “intermediate” vehicles
Future

• More innovations in Light Electric Vehicles
• More “intermediate” vehicles
Option 1: Extra categories and exceptions

→ For every innovative vehicle, creation of new category or extra exception?
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→ Knowledge of road users up to date?
Option 2: Dogmatic approach
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What about?
Back to the essence of traffic regulations

"A set of agreements, which regulate traffic behaviour on the road in advance, general rules that are applicable in every situation and that regulate the positions and movements on the road in such a way that collisions are avoided"
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• Is “motor ⇔ muscle power” a good distinction to avoid collisions?
Back to the essence of traffic regulations

"A set of agreements, which regulate traffic behaviour on the road in advance, general rules that are applicable in every situation and that regulate the positions and movements on the road in such a way that collisions are avoided"

• Is “motor $\Leftrightarrow$ muscle power” a good distinction to avoid collisions?

• Alternative: based on objective parameters
  $\rightarrow$ Actual speed (road dependent)
  $\rightarrow$ Mass and dimensions (vehicle dependent)
  $\rightarrow$ Impulse and kinetic energy
Conclusion

• Speed pedelec offers various social and personal advantages

• Typical speed varies between that of bicycle and moped

• Introduction of ‘moped type speed pedelec’ in Belgian traffic legislation

• New innovative vehicles?
  • Creation of new categories and exceptions?
  • Distinction based on “Motor ⇔ Muscle power”?
  • Basing distinction on objective, measureable parameters?
Questions, ideas or suggestions?

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