Factors contributing to pedelec crashes in the Netherlands

N. Kovácsöva, J.C.F. de Winter, A.L. Schwab, M.P. Hagenzieker

1. Introduction

In the Netherlands, five percent of the people own a pedelec (PEDAL ELECTRIC Cycle), with a relatively high ownership rate and mileage among women and people aged 60 and over (van Boggelen et al., 2013). The pedelec market can be broken down into two categories: “pedelecs” and “speed pedelecs”. Unfortunately, neither research nor safety data distinguish between these two types of pedelecs so that the effects of potentially higher speed and of modal shifts on road safety are yet unclear.

Although a steady decline in bicyclist fatality rates can be seen, the number of seriously injured bicyclists has been increasing in the Netherlands (van Boggelen et al., 2014a, b). Research should indicate whether the increasing number of motorized vehicle was involved happened on a pedelec (Davidse et al., 2014a). The characteristics of pedelecs and speed pedelecs in the Netherlands (Directive 2002/24/EC; reith, 2012; Kühn, 2012). “Regulation in Directive 2002/24/EC is currently not implemented in the Netherlands.”

2. Objective

This paper categorizes contributing factors of pedelec crashes based on results of previous studies in the Netherlands. We use a framework of multilevel sociocultural and technical environment of road traffic (Ozkam, 2006).

3. Studies of pedelec crashes

A literature search was conducted to retrieve Dutch research studies that aimed for insight into i) ownership of a pedelec and ii) the safety of pedelecs. Of 12 reviewed research studies, 5 papers were chosen based on sample size, methodology, and studied factors. These studies serve as a starting point for the categorization of factors that contribute to the likelihood of pedelec accidents.

4. Factors

Old persons 1, 2, 3, 4, 5
• High mental workload 3
• Less likely to have accidents while being overtaken by another road user as compared to conventional bicycles.

Older persons ride slower than middle-aged cyclists. Older persons have problems with bicycle handling and balance during sudden changes of direction. Older persons have problems with bicycle handling and balance during sudden changes of direction.

- High mental workload
- Lower reaction speed
- Less likely to have accidents while being overtaken by another road user as compared to conventional bicycles.

More likely to walk while being overtaken by another road user as compared to conventional bicycles.

5. Pedelec research priorities

a) Registration of pedelec accidents as a separate category in crash reports
b) Examination of modal shifts and their impact on road safety
c) Investigation of the mechanical stability of pedelecs

References


