

Overview of main accident types and parameters in car-to-cyclist accidents in EU for use in AEB-systems test protocol

S.H.H.M. Buijssen¹, J. Uittenbogaard², O.M.G.C. Op den Camp³

¹ Integrated Vehicle Safety

TNO

Steenovenweg 1, NL-5708 HN Helmond, The
Netherlands

e-mail: stefanie.dehair@tno.nl

² Integrated Vehicle Safety

TNO

Steenovenweg 1, NL-5708 HN Helmond, The
Netherlands

e-mail: jeroen.uittenbogaard@tno.nl

³ Integrated Vehicle Safety

TNO

Steenovenweg 1, NL-5708 HN Helmond, The Netherlands

e-mail: olaf.opdencamp@tno.nl

ABSTRACT

The overall number of fatalities in traffic accidents in Europe is decreasing but the number of fatalities among cyclist unfortunately is not [1]. A major share of killed cyclist in traffic accidents had a collision with a motorised vehicle [2]. To protect cyclists in such accidents, the automotive industry is developing and implementing safety systems in cars to avoid and mitigate injuries once an accident is unavoidable. An example of such safety system is Automated Emergency Braking-system (AEB). A car equipped with AEB has sensors such as camera and/or radar, and warns and/or brakes in case a collision with an object is evident to happen. Currently, AEB systems designed to avoid car-to-car collisions are part of the Euro NCAP star rating. In 2016 it will be complemented with AEB pedestrian and probably in 2018 with AEB for cyclists.

TNO together with the automotive industry is developing a proof of concept protocol and set-up. Which will be further developed for performing cyclist AEB consumer tests. This paper reports the first step towards this protocol an in-depth accident research, based on literature, database search and real life measurements. The result of this study is an overview of the most representative car-to-cyclist accident scenarios in European countries (Germany, the Netherlands, Sweden, France, Italy, United Kingdom). The scenarios are weighted based on appearance and distinction is made between two different injury levels, namely killed and severely injured (AIS2+). Beside the accident scenarios also its main parameters are described, like e.g. accident location, cyclist speed, impact location. Based on these results four most relevant test scenarios will be defined to be worked out into test scenarios for the AEB-cyclist proof of concept test protocol.

Keywords: car, cyclist, AEB-safety-systems, scenarios, accidents

REFERENCES

- [1] European Commission, *Road Safety Vademecum – road safety trends, statistics and challenges in the EU 2010-2013*, DG for Mobility and Transport Unit C.4 – Road Safety, EU, March 2014.
- [2] M.C.B. Reurings, *Van fietsongeval naar maatregelen: kennis en hiaten - inventarisatie ten behoeve van nationale onderzoeksagenda fietsveiligheid*, M.C.B. Reurings, W.P. Vlakveld, D.A.M. Twisk, A. Dijkstra, W. Wijnen, SWOV report R-2012-8, Leidschendam, 2012