



Detection of motorcycles by advanced driver assistance systems (ADAS)

Safety, a top priority for the motorcycle industry

Vehicle safety is an absolute priority for the motorcycle industry. Over the last decades ACEM members have made considerable efforts to develop technologically advanced vehicles with enhanced safety characteristics.

The motorcycle industry has also taken the lead on road safety campaigns and promoted pre- and post license training among users. This effort has been instrumental in substantially reducing the number of accidents involving motorcyclist across Europe.

ACEM members are currently conducting research on an embedded eCall system for motorcycles and some of them have set up a new research platform, the Connected Motorcycle Consortium to foster cooperation in research and development in the field of C-ITS as well as to promote timely and comprehensive use of C-ITS solutions.

Unintended consequences of ADAS for motorcycles

The European motorcycle accident in-depth study, MAIDS, found that about 37% of all other vehicle (OV) to motorcycle accidents involved an OV driver perception failure. This means that the OV driver may have failed to see the motorcycle prior to the subsequent event that caused the accident.

The motorcycle industry is concerned that the frequency of these types of motorcycle accidents may increase as drivers will depend more and more upon Level 1 and 2 ADAS, potentially becoming less attentive to other vehicles

around them. If ADAS systems are not able to correctly identify motorcycles, a possible consequence of broad ADAS implementation may be an increase in car-motorcycle accidents, even as car accidents decrease.

The European Commission's report 'Saving Lives: Boosting Car Safety in the EU' (COM(2016)0787) proposes several active safety systems, which comprise some of the building blocks towards automation of the vehicles. ACEM notes that in its report the Commission explicitly calls out the need for 'Pedestrian and Cyclist Detection' in paragraph 5.4, in relation to both automatic emergency braking systems and reversing detection systems and to prepare the basis for future standardization activities. This work will enable widespread deployment of eCall systems in the future.

Standardization of eCall solutions is important to ensure that systems are functional and compatible with the existing infrastructure, vehicles and devices. It will also help companies to guide their long-term investment decisions.

Research suggests poor motorcycle detection by car ADAS

In a study presented at the October 2016 International Motorcycles Conference in Cologne, by Dynamic Research Inc. (John F. Lenkeit, Terrance Smith PhD), researchers found that the focus of programmes, such as the New Car Assessment Programme (NCAP) was on evaluating the active safety abilities of ADAS technologies to avoid crashes which are car-car, car-pedestrian or car-bicycle.

Such assessments, however, do not explicitly address issues of car-motorcycle accidents. This may be due to an assumption that if a system works adequately for cars, bicycles and pedestrians, it will also work as well for motorcycles. The Dynamic Research Inc. study surveyed current production vehicles, equipped with forward collision warning (FCW) systems to determine how well these systems function when the Principal Other Vehicle (POV) is an L3 mid-sized motorcycle.

The results were unexpectedly poor:

- When a motorcycle was the POV, it was inadequately detected in 40% of trials.
- In nearly 17% of the motorcycle POV trials, no alert was presented to the driver of the subject vehicle.
- Particular difficulty was found in detecting a stopped motorcycle. For the stopped motorcycle POV, in 44% of the valid trials, the alert was provided late, and in 24% there was no alert provided.

The study's conclusions and recommendations include the following:

- In order for the safety benefits of ADAS systems to extend to motorcycles, such systems need to reliably detect motorcycles in potential crash scenarios.
- One way to encourage and verify this would be to include motorcycles or their representations in ADAS test procedures.

The study's conclusions and recommendations include the following (continued):

- Identify the response properties of a range of actual motorcycles (including riders) to sensing technologies, including radar, camera, lidar, etc.
- Develop credible motorcycle targets and delivery systems.
- Include these targets and motorcycle specific scenarios in future test procedures.

INDUSTRY POSITION ON MOTORCYCLE DETECTION BY ADAS

- ACEM calls upon the European Commission to include the mandatory detection of motorcycles in future proposals for mandatory M1, N1 and HGV ADAS.
- Motorcyclists should be considered as vulnerable road users in this context, as they could be endangered by any ADAS system, which cannot detect their presence.
- ACEM and its members are currently working with the car industry to develop credible motorcycle targets for use in ADAS testing.

About ACEM

The European Association of Motorcycle Manufacturers (ACEM) represents manufacturers of mopeds, motorcycles, three-wheelers and quadricycles (L-category vehicles) in Europe.

ACEM members include 17 manufacturing companies: BMW Motorrad, Bombardier Recreational Products (BRP), Ducati Motor holding, Harley-Davidson, Honda, Kawasaki, KTM, KYMCO, MV Agusta, Peugeot Scooters, Piaggio, Polaris Industries, Renault, Royal Enfield, Suzuki, Triumph Motorcycles and Yamaha.

ACEM also represents 17 motorcycle industry associations in 14 different European countries. About 156,000 jobs depend on the L-category industry in Europe. There are about 35.3 million motorcycles and scooters on Europe's roads (2015 figures).

To find out more about ACEM please visit www.acem.eu