Document Information

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4.8 Dangerous Curve Warning / Curve Speed Warning (DCW/CSW)

4.8.1 General description

The Dangerous Curve Warning and Curve Speed Warning (DCW/CSW) application helps to prevent single-vehicle accidents with PTWs leaving the road and frontal collisions with vehicles travelling in the opposite direction. It warns the rider when approaching a curve which has been classified as dangerous according to publically available data, road characteristics or depending on environmental conditions such as weather. In addition, weather information and own PTW's information can be used to decide whether a warning is presented or not.

The DCW provides information on curves with many accidents, and the CSW additionally has an advanced function of notifying a recommended speed.

4.8.2 Use case description of DCW

This use case is especially prominent on non-urban roads and in curves. The safety in curves is important for PTW riders. One possible application is a curve warning system that warns a rider in case they approach a curve which is known to be dangerous for PTW riders according to accident data, data about the road conditions or location specific hazards. Information needed for this application can be obtained, for example from an infrastructure such as Road Side Unit (RSU).

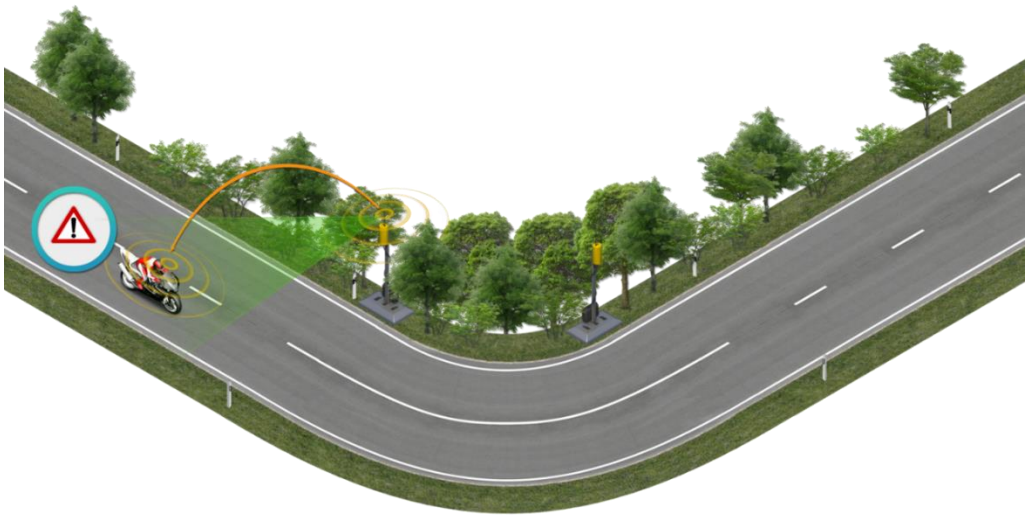

Figure 1: Overview of dangerous curve warning

To be able to present such a warning, information of the dangerous curve has to be transferred to own system and/or a classification system has to be developed which can be used to

categorise the curves as dangerous. In addition, the warning must be communicated effectively to the rider. As a first step it could be presented e.g., visually in the cockpit, but generally also via acoustic announcements. In theory the warning could include a recommendation for the appropriate action e.g., to slow down, to choose a safe riding lane or to watch out for oncoming vehicles or road damages. Therefore, additional information would be needed on the specific hazard (e.g., friction due to weather conditions or soiling, road damages, speed and position of oncoming traffic).

4.8.3 Use case description of CSW

The CSW application is an extension of the DCW application. This application will process same information as described in the DCW application. In addition, the CSW needs additional information provided by the infrastructure such as a recommended speed for curve. A more advanced application could include weather information, information about road surface conditions and others to decide whether the warning is presented or not.
When the PTW approaching a curve, receives a message sent to the PTW itself, it will warn the PTW rider in front of the curve, considering the information obtained from the infrastructure and the actual speed of the PTW.

One of the important challenges in CSW is how to determine optimal speed to be proposed to the riders. The optimal speed can be influenced not only by curvature, but also by road condition, wind, and even by rider’s skill. Therefore, further investigation on how these factors influence the optimal speed is required.

Abbreviations

Please refer to the abbreviations in Preamble document.