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Intelligent transport systems — Vehicle-to-vehicle intersection collision warning systems (VVICW) — Performance requirements and test procedures

Systèmes de transport intelligents — Systèmes d'alerte de collision aux intersections de véhicule-à-véhicule (VVICW) — Exigences de performance et procédures d'essai

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Vehicle-to-vehicle intersection collision warning systems (VVICW) warn the driver to avoid potential collisions at intersections. The VVICW warns the driver of imminent crashes with other vehicles crossing at a road junction. The system relies on relative positioning, speed and heading between vehicles determined using vehicle-to-vehicle (V2V) communication, such as dedicated short-range communication (DSRC). It is intended to be used to avoid intersection crossing crashes, the most severe crashes based on fatality counts. Due to limited field of view sensing, on-board sensor systems such as camera, lidar and radar systems cannot be used efficiently for such systems. Figure 1 illustrates the functional elements of VVICW.

The VVICW is a road level system that deals with conflict scenarios between vehicles driving on two connected road segments sharing a common intersection. VVICW positioning requirements are not demanding compared to those of red light violation warning systems, for example. A comprehensive set of intersection collision scenarios can be found in Reference [1].

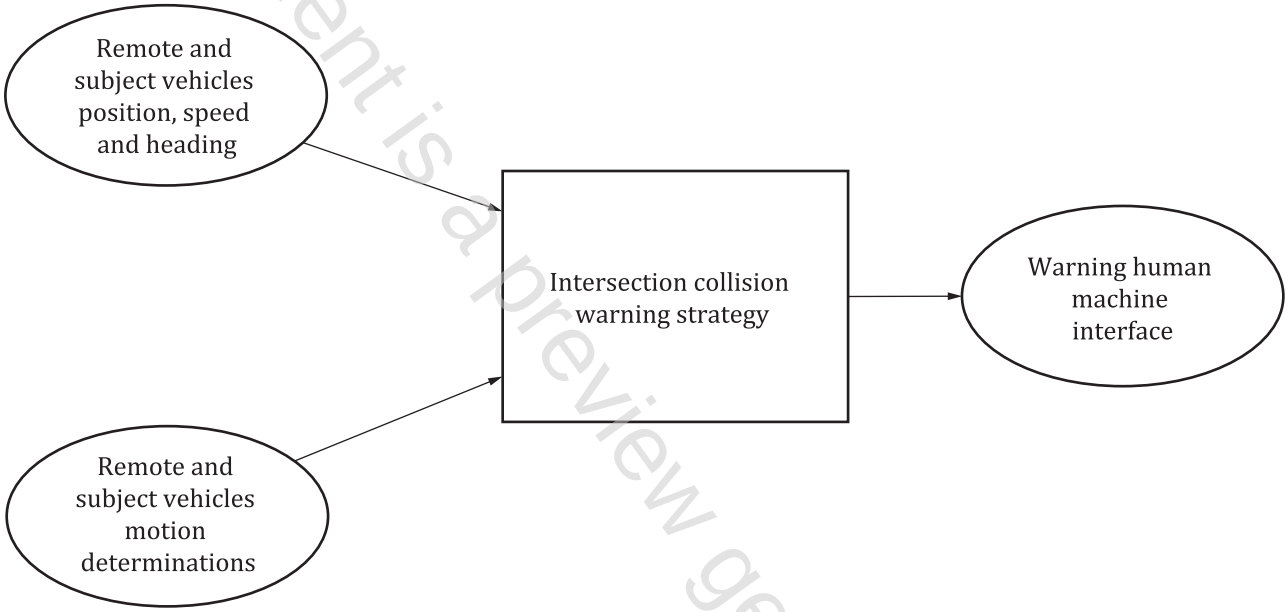

Figure 1 — Vehicle-to-vehicle intersection collision warning systems functional elements

Intelligent transport systems — Vehicle-to-vehicle intersection collision warning systems (VVICW) — Performance requirements and test procedures

1 Scope

This document specifies performance requirements and test procedures for systems capable of warning the subject vehicle driver of a potential crossing-path collision with other vehicles at intersecting road segments.

Vehicle-to-vehicle intersection collision warning systems (VVICW) rely on vehicle-to-vehicle (V2V) communications and relative positioning between the subject vehicle and crossing-path vehicles (remote vehicles). V2V data, such as position, speed and heading are used to evaluate if an intersection collision is imminent between the subject and remote vehicles. The performance requirements laid out in this document specify the warning criteria for these systems.

In addition, VVICW operate in specified subject and remote vehicle speed ranges, road intersection geometries and target vehicle types. Moreover, the requirements for the V2V data will be specified. The scope of this document includes operations on intersecting road segments (physically intersecting roads), and motor vehicles including cars, trucks, buses and motorcycles. Responsibility for the safe operation of the vehicle remains with the driver.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
subject vehicle
SV
motor vehicle equipped with a VVICW

Note 1 to entry: A subject vehicle can be also a remote vehicle for another subject vehicle.

3.2
subject vehicle speed
subject vehicle velocity in the heading direction

3.3
remote vehicle
RV
motor vehicle equipped at minimum with a V2V transmission device and localization system and that has the ability to possibly intersect the path of the subject vehicle