
**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*



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	3
5 Requirements	4
5.1 Minimum enable conditions	4
5.2 Minimum required VVICW scenarios	4
5.3 Necessary functions	5
5.4 State transition diagram	6
5.4.1 General	6
5.4.2 State functional description	6
6 Warning provisions	7
6.1 VVICW output	7
6.2 Warning modality	7
6.3 Warning criteria for crossing scenarios	8
6.3.1 Warning requirements	8
6.3.2 No warning provisions	10
6.4 Warning criteria for oncoming scenarios	11
6.4.1 Warning requirements	11
6.4.2 No warning requirements	11
7 V2V data provisions: permissions	12
8 Testing procedures	12
8.1 General	12
8.2 Crossing scenarios	12
8.2.1 Warning tests	12
8.2.2 No warning tests	14
8.3 Oncoming scenarios	15
8.3.1 Warning tests	15
8.3.2 No warning tests	16
Bibliography	18

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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].

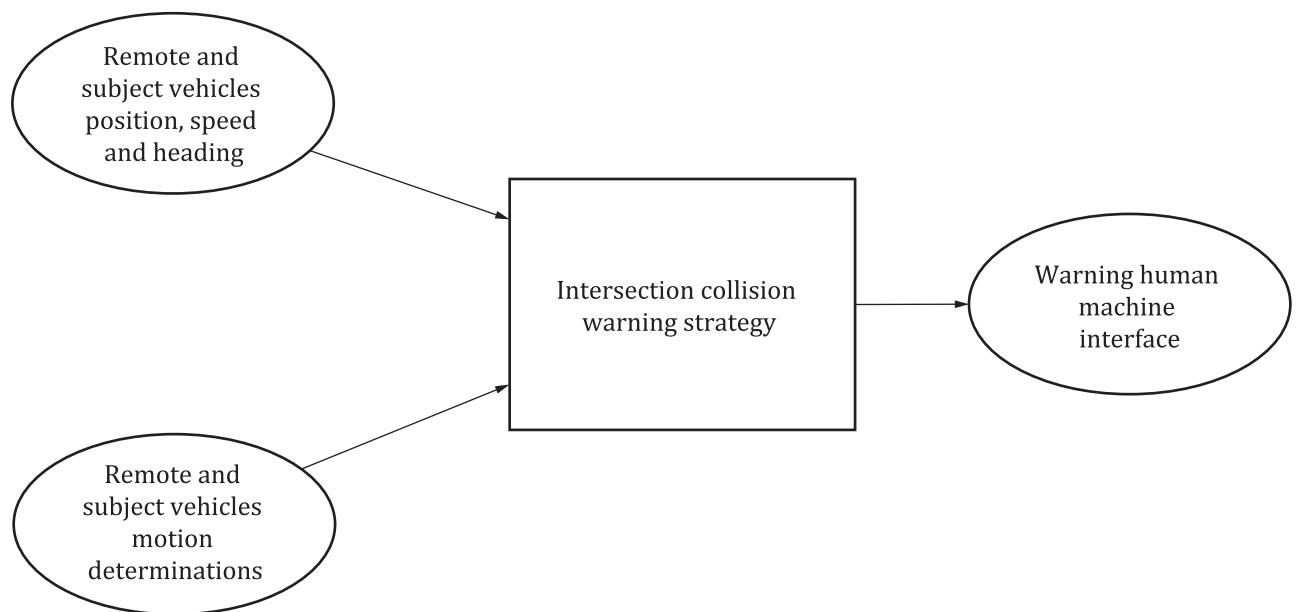


Figure 1 — Vehicle-to-vehicle intersection collision warning systems functional elements