Technical Report

ISO/TR 22087

Intelligent transport systems — Collection of agent behaviour information and sharing between ITS stations

Systèmes de transport intelligents — Collecte d'informations sur le comportement des agents et partage entre les stations ITS

First edition
2025-05

Reference number
ISO/TR 22087:2025(en)

© ISO 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

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, definitions and abbreviated terms **1**
3.1 Terms and definitions 1
3.2 Abbreviated terms 2
4 Introduction of DBIS **2**
4.1 Ego-vehicle's DBIS 2
4.2 Driver's intention 4
4.2.1 General 4
4.2.2 Intention of longitudinal control 4
4.2.3 Intention of lateral control 4
4.2.4 State of driver 4
4.3 Status of vehicle 4
4.3.1 Speed of vehicle 4
4.3.2 Distance of vehicles 4
4.3.3 Vehicle type 4
4.3.4 Vehicle location 4
4.4 Road-environment information 5
4.4.1 Traffic property of road 5
4.4.2 Additional property of road 5
4.5 Egocentric surrounding object's information 5
4.6 Related messages 5
4.6.1 Collection of DBIS 5
4.6.2 Sharing DBIS 5
4.7 Functional components 6
5 Use case overview and principles **7**
5.1 Basic principles for use case definition 7
5.2 Overview of collective perception 7
5.3 Overview of learning to predict and assess collision risk 8
5.4 Use case clusters 9
6 Use case definition **10**
6.1 Overview 10
6.2 UC cluster 1 - Collective perception 10
6.2.1 UC 1.1 - Sharing the intention of an ego vehicle to make lane change 10
6.2.2 UC 1.2 - Situation perception of cut-in/cut-out of adjacent vehicles 11
6.3 UC cluster 2 - Learning to predict and assess collision risk 12
6.3.1 UC 2.1 - Collision prediction if vehicle suddenly attempts to enter left/right lane 12
6.3.2 UC 2.2 – Situation awareness of the collision with speed-up straight-ahead vehicle when vehicle attempts to change lane 13
6.3.3 UC 2.3 – Assessment of driving method when all vehicles ahead suddenly slow down 14
Bibliography **16**

© ISO 2025 – All rights reserved

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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.

© ISO 2025 – All rights reserved

Introduction

Autonomous driving technology using artificial intelligence is becoming increasingly important for the safe operation of vehicles on the road. To be effective, artificial intelligence needs to gather a lot of information about a vehicle's behaviour and use it to learn. In order to drive safely on the road, self-driving vehicles need to be aware of the status of other vehicles, road conditions, weather conditions and other external conditions, in addition to their own vehicle.

As the need for defensive driving increases, it is also important for driver assistance or autonomous driving systems to understand the driving intentions of other vehicles.

The driving behaviour information set (DBIS) consists of the operations of the subject vehicle and the associated traffic situation, locally perceived from an egocentric perspective. By sharing this DBIS between vehicles, it can be used for driving situation prediction algorithms based on artificial intelligence technology or for real-time optimal driving decisions.

© ISO 2025 – All rights reserved

Intelligent transport systems — Collection of agent behaviour information and sharing between ITS stations

1 Scope

This document describes the common description of the driving behaviour information set (DBIS) data structure and data exchange procedures for sharing among distributed ITS stations by nomadic devices.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

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 Terms and definitions

3.1.1
nomadic device
ND
implementation of a personal ITS station which provides communication connectivity via equipment such as cellular telephones, mobile wireless broadband (WIMAX, HC-SDMA, etc.), WiFi etc. and includes short range links, such as Bluetooth or Zigbee to connect portable devices to the motor vehicle communications system network

3.1.2
personal ITS station
P-ITS-S
implementation of an ITS station in a personal ITS subsystem

3.1.3
roadside ITS station
R-ITS-S
system, is installed at the road side, that receives and processes vehicular and pedestrian information within a certain zone and determines the situation, in order to provide the safety warning and parking guide service to vehicles and pedestrians

3.1.4
central ITS
C-ITS
ITS station assuming a central role.

3.1.5
vehicle ITS station
V-ITS-S
implementation of an ITS station in a vehicle ITS subsystem.

© ISO 2025 – All rights reserved