

This is a preview of "ISO/TS 16951:2021". [Click here to purchase the full version from the ANSI store.](#)

Second edition
2021-03

Road vehicles — Ergonomic aspects of transport information and control systems (TICS) — Procedures for determining priority of on-board messages presented to drivers

Véhicules routiers — Aspects ergonomiques des systèmes de commande et d'information du transport (TICS) — Modes opératoires pour la détermination de la priorité des messages embarqués présentés aux conducteurs



Reference number
ISO/TS 16951:2021(E)

© ISO 2021



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

This is a preview of "ISO/TS 16951:2021". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Data collection for the priority index procedure	3
4.1 General.....	3
4.2 Appoint an examiner.....	3
4.3 Identify and assemble messages.....	3
4.4 Define driving context and situation.....	3
4.4.1 Consider the sensing capability of the vehicle.....	3
4.4.2 Factors to consider in developing the driving scenarios.....	4
4.4.3 Document the driving context and situation.....	4
4.5 Select the evaluators.....	5
4.6 Evaluate criticality and urgency of a message.....	6
4.7 Instructions for the examiner.....	6
4.8 Alternative method for determining message priority.....	7
5 Data analysis for priority index	8
5.1 General.....	8
5.2 Select weights.....	8
5.3 Calculate priority, p_{ij}	8
5.4 Calculate arithmetic mean and standard deviation of priority index across evaluators for each message.....	9
5.5 Calculate P_j and σ_j	9
5.6 Determine priority order.....	9
5.7 Evaluate data quality.....	10
6 Application of results	10
6.1 Prioritization of priority ranking.....	10
6.2 How to deal with additional messages.....	10
6.3 Documentation.....	10
6.4 Other.....	11
Annex A (normative) Priority matrix method	12
Annex B (informative) System reaction matrix for priority matrix method	16
Annex C (informative) Rationale for recommended number of evaluators for priority index method	18
Annex D (informative) Example evaluator profile	21
Annex E (informative) Driving scenarios	22
Annex F (informative) Criticality and urgency as the evaluation criteria	25
Annex G (informative) Deriving weight k_c and k_u	26
Annex H (informative) Sample report format	28
Annex I (informative) "Acceptable" standard deviations σ_j for priority indexes	29
Bibliography	31

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 22, *Road vehicles*, Subcommittee SC 39, *Ergonomics*.

This second edition cancels and replaces the first edition (ISO/TS 16951:2004), which has been technically revised.

The main changes compared to the previous edition are as follows:

- formulae and other errors corrected;
- editorial updates.

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.

This is a preview of "ISO/TS 16951:2021". [Click here to purchase the full version from the ANSI store.](#)

Introduction

When multiple in-vehicle information systems are present, including both transport information and control systems (TICS) and non-TICS, various kinds of messages will be presented to drivers from these systems and displayed at various times. If these messages are not managed properly, drivers could fail to obtain critical information, which may degrade safety. This document establishes two prioritization methods for TICS and other system-initiated messages or driver-requested messages presented to drivers while driving. Other prioritization methods are possible. The primary method given in this document takes criticality and urgency ratings of such messages into consideration when calculating a priority index. If the mathematical calculations are avoided for some reason, an alternative method presented in [Annex A](#) is applied. The alternative method involves paired comparisons of all possible messages to form a priority matrix. Its relative advantages and disadvantages are discussed in [Annex A](#). [Annex B](#) presents one way of managing messages using the priority obtained by [Annex A](#).

Priority is one of the parameters to consider in determining when, where and how system messages are displayed. As TICS applications are deployed, the number and frequency of TICS messages presented to drivers can be expected to increase. This document will provide road vehicle manufacturers and TICS suppliers with a consistent basis for the management of messages competing for the driver's limited information processing capability. This, in turn, will reduce the driver's workload and help ensure that the most important messages reach the driver. This document complements ISO 15005^[3], a dialogue management standard.

This document is intended for those involved in the design of message management systems that integrate in-vehicle messages. It describes how to establish message priorities. It also specifies criteria for message prioritization and, therefore, serves as an evaluation tool for TICS installed in vehicles as standard equipment and for after-market TICS devices.