

ISO/DTR 17732:~~2022(E)~~

ISO/TC 204-WG16

~~2023-09-20~~

Secretariat: ANSI

Date: 2023-10-31

Intelligent ~~Transport Systems~~ — ~~transport systems (ITS)~~ — ~~Communications~~ —
— ITS ~~Communication Role~~ communication role and ~~Functional Model~~

~~WD/CIB/DTR/TR Stage~~

Document Preview

Warning for WDs and CDs

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

To help you, this guide on writing standards was produced by the ISO/TMB and is available at

functional model *manuscript of a draft International Standard (known as “The Rice Model”) is available at*

Systèmes de transport intelligents (ITS) — Communications — Rôle des communications et modèle fonctionnel des ITS

FDIS stage

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/DTR 17732](#)

<https://standards.iteh.ai/catalog/standards/sist/fl174ef9-2adf-45db-be01-538ce7921750/iso-dtr-17732>

© ISO 2023

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~~E-mail: copyright@iso.org
Website: www.iso.org~~www.iso.org~~

Published in Switzerland

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/DTR 17732](#)

<https://standards.iteh.ai/catalog/standards/sist/fl174ef9-2adf-45db-be01-538ce7921750/iso-dtr-17732>

Contents

Foreword	vi
Introduction.....	viii
1 Scope	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Abbreviated terms.....	2
5 ITS communication functions	2
5.1 General	2
5.2 Cyber security in ITS application services.....	2
5.3 Moving data between actors	2
5.4 Connected vehicle/device environment.....	2
5.4.1 General.....	2
5.4.2 Low latency.....	3
5.4.3 Multi-device access capability	3
5.4.4 Network slicing.....	3
5.4.5 Carrier aggregation	3
5.4.6 Propagation speed difference between wired and wireless environments	3
5.4.7 Radio frequency spectrum sharing.....	3
5.4.8 Open radio access network.....	3
5.4.9 Cloud network.....	4
6 Role and function model	4
6.1 Objective	4
6.2 National variations.....	4
6.3 Basic role model architecture	4
6.3.1 General.....	4
6.3.2 Smart city sensor data (probe data).....	5
6.3.3 3D HD map	6
6.3.4 Digital infrastructure	6
6.3.5 Mobility supporting facility.....	6
6.3.6 Physical infrastructure platform	6
6.3.7 ITS service providers.....	7
6.3.8 Communication (communication service provider)	7
6.3.9 Mobility users	7
6.4 Application layer role and functional model for ITS application service	7
6.4.1 General.....	7
6.4.2 Role and functional model options	8
6.4.3 Certification of service providers	9
6.5 ITS service role and functional model.....	9

Bibliography 13

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ISO/DTR 17732](https://standards.itih.ai/catalog/standards/sist/f1174ef9-2adf-45db-be01-538ee7921750/iso-dtr-17732)

<https://standards.itih.ai/catalog/standards/sist/f1174ef9-2adf-45db-be01-538ee7921750/iso-dtr-17732>

Foreword

ISO (the

**iTeh Standards
(<https://standards.iteh.ai>)
Document Preview**

ISO/DTR 17732

<https://standards.iteh.ai/catalog/standards/sist/f1174ef9-2adf-45db-be01-538ce7921750/iso-dtr-17732>

Foreword

The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally ~~conducted~~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 ~~several~~different types of ISO ~~documents~~document 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~~ISO draws attention to the possibility that ~~some of the~~elements~~implementation~~ of this document may ~~be~~involve the ~~subject~~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. ~~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)~~.

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*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

Currently, more than 70 % of the world's people live in cities. The proportion of people living in cities is rising around the world as civilizations develop and congregate around cities where employment opportunity most arises. Societies develop more innovatively and more rapidly in cities, and cities present better entertainment opportunities, all adding to their attraction and popularity; hence, the continuing trend. The Economist magazine recently forecast that by 2045 an extra two billion people will live in urban areas. Due to the concentration of the population that this causes, various issues arise such as road congestion due to increase in vehicle population, and environmental pollution due to exhaust gas and tire erosion. This has been attributed to increases in the number of delivery trucks, taxis, and town centre traffic which is further exacerbated by obstacles and effective use of urban space due to private ownership of cars (parking lots, street parking).

It is recognized that there is also road infrastructure deterioration, lack of provision of information on the use of public transportation, driver shortages, and inconvenience of multimodal fare payments. ~~Action~~The action to improve this situation is urgently needed.

Changing consumer tastes are also calling for new types of infrastructure. Today's city dwellers, for example, increasingly shop online and expect ever faster delivery times. To meet their needs, modern urban areas need the support of last-minute distribution centres, backed by out-of-town warehouses.

In recent years, European studies on the development of mobility integration standards have been active to solve urban problems. Important key factors are the core architectural elements of smart cities, including urban ~~ITS~~intelligent transport system (ITS) sharing of probe data (also called sensor data), connected cars, automated driving, and communication infrastructure. In addition, current issues have been recognized with the introduction of the connected car to the real world in respect of privacy protection, the need to strengthen security measures, big data collection, and processing measures, which are becoming important considerations.

In terms of effective use of urban space, it is hoped that the introduction of connected cars and automated driving can significantly reduce the requirements for urban parking lots (redistribution of road space). If technology can eliminate congestion, city road area usage can also be minimized - reallocated (space utilization improvement) to improve the city living environment/quality of life. In addition, the environment around the road will be improved by improving enforcement (e.g., overloaded vehicles). Even in rural areas it is possible to introduce automated driving robot taxis and other shared mobility that saves labour (and is, therefore, more affordable) and improves mobility ~~to~~for those who do not drive (e.g., the elderly and those with disabilities). The communications will play a significant role.

Achieving this requires the realization of various issues. Some examples are as follows:

- ~~Cooperation~~cooperation with harmonization of ~~de jure~~standards such as ISO and ~~existing~~industry existing standards;
- ~~Recognition~~recognition of the significance of international standardization (for example, to reduce implementation costs);
- ~~Recognition~~recognition of the significance of harmonization activities by countries around the world.
- ~~Cooperation and contribution between ISO/TC22 for in-vehicle systems and ISO TC204 for ITS technology~~

As mentioned previously, automated driving mobility is expected to play a significant role both in cities and in rural areas. The main effects are reduction of traffic accidents, reduction of environmental burden, elimination of traffic congestion, and realization of effective use of urban space.

ITS technology is a crucial element for realizing 'smart' cities, and it is important to clearly understand the role model of ITS application services when developing standards to achieve these objectives.

This document is intended to be an important guidebook for this objective. Considering the emerging direction of mobility electrification, automated driving, and the direction of an environmentally friendly society, incorporating other urban data such as traffic management into the city management will improve the mobility of urban society. ~~ISO/TC204/WG16 recognizes that it~~ is important to identify the importance of the communication role that connects all related actors in the framework with necessary security measures. To consider this, the creation of a common open role model for communication platforms is important. The platforms will be necessary for the realization of the future mobility services such as automated driving vehicles. A common role model will be developed for all modes of vehicles, including public transport, general passenger vehicles, and heavy vehicles. The incorporation of electronic regulation is especially important for automated vehicles, and it is essential to incorporate it as a core element of ~~Urban~~urban ITS.

This document describes how ITS data can be presented, interchanged, and used by smart cities by using communications. This document does not describe smart city use cases for ITS data in ~~any detail (out of scope of TC204)~~, nor does it describe in detail any specific ITS use cases; ~~but is focusses instead, this document focuses~~ on the generic role model for data exchange between ITS and smart cities.

~~The ISO 21177 establishes the necessary security and data exchange protocols have now been finalized to provide a 'secure ITS interface,' with the approval of ISO 21177 'Intelligent transport systems — ITS station security services for secure session establishment and authentication between trusted devices' interface~~ (i.e., exchange information with bi-directional protection).

~~The ISO 21177 enables two devices to cooperate in a trusted way (i.e., exchange information in secure application sessions, and thus only access data or request data that it has the appropriate credentials to access).~~

~~The ISO/WG16 has promoted standardization deliverables~~Multiple standards have been published regarding communication media, communication security, networking, ITS Station architecture, and ITS ~~Station~~station management. It is true that as ~~those deliverables~~these standards are used for ITS services to cooperate with various related services such as ~~Smart City~~smart city and ~~Mobility~~mobility as a ~~Service~~service (MaaS), the role and functions of communication also have a tendency to be changed.

One of this document's purposes is to reorganize the role-function model of communication corresponding to the ~~Smart City~~smart city/MaaS era from the viewpoint of standardization.

This document can contribute to the development of communications standards for the mobility system service business cases other than system services described within this document.

