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Intelligent transport systems — Station and communication architecture

Systèmes de transport intelligents — Architecture du station et du communication

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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.*

This third edition cancels and replaces the second edition (ISO 21217:2014), which has been technically revised.

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

— many general alignments with other standards (e.g. on terms and abbreviations, and on references) revised or developed since the publication of the second edition of this document;

— prioritization in the receive path added;

— more details on hybrid communications included;

— details on security requirements added.

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

This document provides the intelligent transport systems (ITS) station and communication reference architecture that is referenced in a family of deliverables from standard development organizations (SDOs) for cooperative intelligent transport systems (C-ITS), which is a subset of standards for ITS.

ITS aims to improve surface transportation in terms of:

— **safety**
e.g. crash avoidance, obstacle detection, emergency calls, dangerous goods;

— **efficiency**
e.g. navigation, green wave, priority, lane access control, contextual speed limits, car sharing;

— **comfort**
e.g. telematics, parking, electric vehicle charging, infotainment; and

— **sustainability**,

by applying information and communication technologies (ICT).

ITS specifications are in general developed to address a specific ITS service domain (see ISO 14813-1), such as public transport, road safety, freight and logistics, public emergencies or electronic fee collection.

To support interoperability, C-ITS specifications are developed to exchange and share information amongst ITS applications of a given application domain and even between application domains.

C-ITS services are based on the exchange of data between vehicles of any category (cars, trucks, buses, emergency and specialized vehicles, etc.), the roadside and urban infrastructure (traffic lights, road tolls, variable message signs, etc.), control and services centres (traffic control centre, service providers, map providers, etc.), and other road users (pedestrians, cyclists, etc.).

Some ITS services require cooperation by vehicles with their surrounding environment (other vehicles, other road users, roadside and urban infrastructure, etc.) while other ITS services require connectivity to remote service platforms (road traffic control centres, map providers, service providers, fleet managers, equipment manufacturers, etc.).

In order to support:

— a large variety of C-ITS services with diverging requirements, and

— efficient sharing of information maintained by individual service applications,

it is necessary to combine multiple access technologies and communication protocols with distinct performance characteristics (communication range, available bandwidth, end-to-end transmission delay, quality of service, security, etc.); see Figure 1.
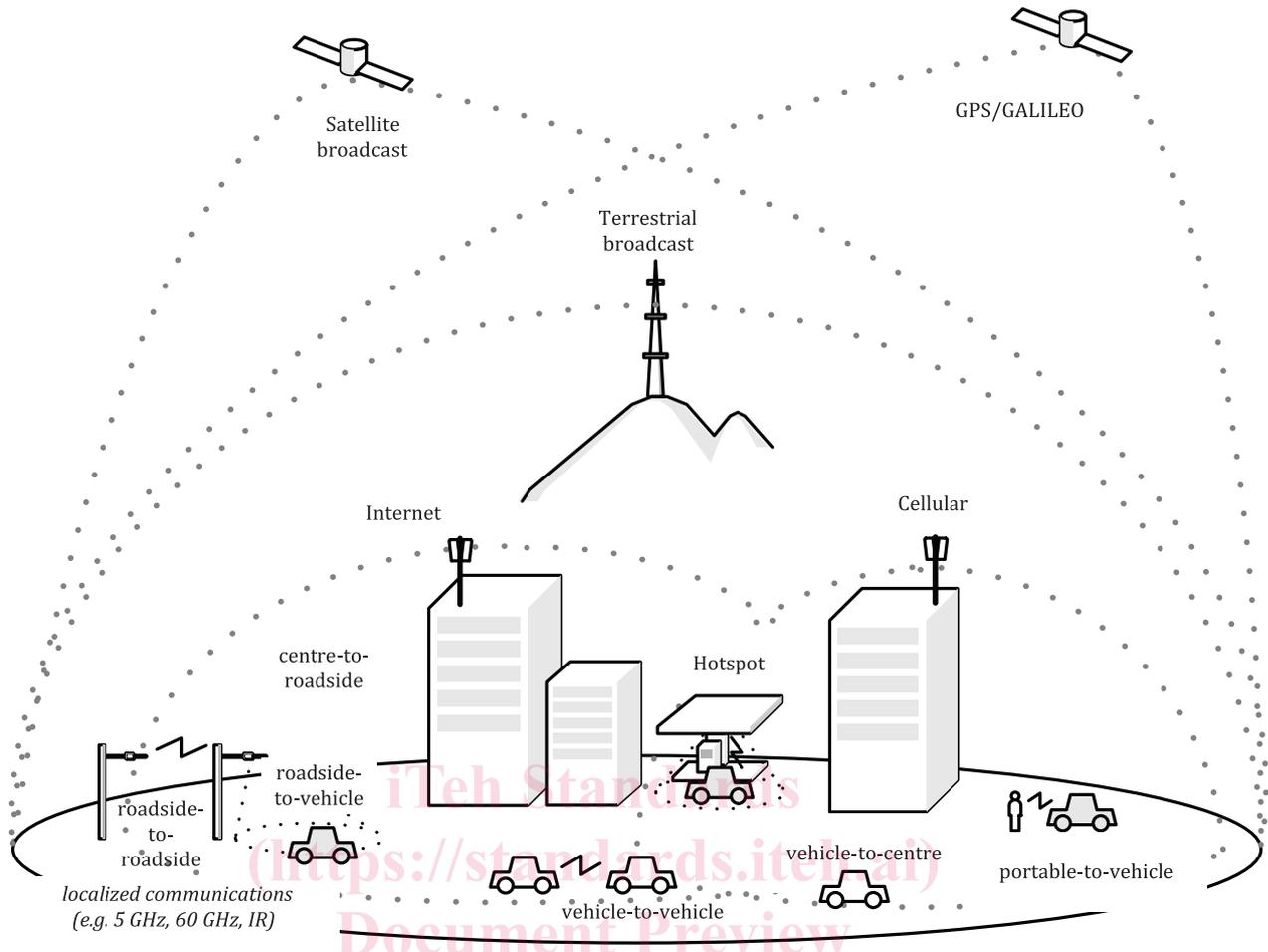
Figure 1 — Examples of ITS communications

Combining multiple access technologies and communication protocols requires a common approach to the way communications and data are securely managed, which is specified in this document (see Figure 2).