TECHNICAL ISO/TR

First edition
2015-11-01

Intelligent transport systems — Cooperative ITS —

Part 3: Concept of operations (ConOps) for 'core' systems

Systèmes intelligents de transport — Systèmes intelligents de transport coopératifs —

Partie 3: Concept des opérations (ConOps) pour les systèmes 'principaux'

Reference number
ISO/TR 17427-3:2015(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

ISO 17427 consists of the following parts under the general title, *Intelligent transport systems — Cooperative ITS*:

— *Part 2: Framework overview* [Technical Report]

— *Part 3: Concept of operations (ConOps) for 'Core' systems* [Technical Report]

— *Part 4: Minimum system requirements and behaviour for core systems* [Technical Report]

— *Part 6: Core systems risk assessment methodology* [Technical Report]

— *Part 7: Privacy aspects* [Technical Report]

— *Part 8: Liability aspects* [Technical Report]

— *Part 9: Compliance and enforcement aspects* [Technical Report]

— *Part 10: Driver distraction and information display* [Technical Report]

The following parts are under preparation:

— *Part 1: Roles and responsibilities in the context of co-operative ITS architectures(s)*

— *Part 5: Common approaches to security* [Technical Report]

— *Part 11: Compliance and enforcement aspects* [Technical Report]

— *Part 12: Release processes* [Technical Report]

— *Part 13: Use case test cases* [Technical Report]

— *Part 14: Maintenance requirements and processes* [Technical Report]

This Technical Report provides an informative 'Concept of operations for ore systems' supporting *Cooperative intelligent transport systems* (*C-ITS*). It is intended to be used alongside ISO 17427-1, ISO/TR 17465-1 and other parts of ISO 17465, and ISO 21217. Detailed specifications for the application context will be provided by other ISO, CEN and SAE deliverables, and communications specifications will be provided by ISO, IEEE and ETSI.

Introduction

Intelligent transport systems (*ITS*) are transport systems in which advanced information, *communication*, sensor and control technologies, including the Internet, are applied to increase safety, sustainability, efficiency, and comfort in the movement of people and goods.

A distinguishing feature of '*ITS*' is its *communication* with outside entities.

Some *ITS*s operate autonomously, for example, 'adaptive cruise control' uses radar/lidar/and/or video to characterize the behaviour of the vehicle in front and adjust its vehicle speed accordingly. Some *ITS*s are informative, for example, 'Variable Message Signs' at the roadside, or transmitted into the vehicle, provide information and advice to the driver. Some *ITS*s are semi-autonomous, in that they are largely autonomous, but rely on 'static' or 'broadcast' data, for example, *GNSS*-based 'SatNav' systems operate autonomously within a vehicle but are dependent on receiving data broadcast from satellites in order to calculate the location of the vehicle.

*Cooperative intelligent transport system*s (*C-ITS*) are a group of *ITS* technologies where service provision is enabled by, or enhanced by, the use of 'live', present situation related, dynamic data/information from other entities of similar functionality [for example, from one vehicle to other vehicle(s)], and/or between different elements of the transport network, including vehicles and infrastructure [for example, from the vehicle to an infrastructure-managed system or from an infrastructure-managed system to vehicle(s)]. Effectively, these technologies enable vehicles to 'talk' to each other and to the infrastructure, and in so doing will have significant potential to improve the safe, sustainable and efficient operation of the transport network.

A distinguishing feature of '*C-ITS*' is that data is used across application/service boundaries. This means that data collected at one point and/or processed by one application becomes available to be re-used by other applications, which may be operating in the same, or different physical entities.

The difference between any '*ITS* implementation' and a '*C-ITS* implementation' is that *C-ITS*s are dependent on the interaction with other vehicles and/or the infrastructure, and the exchange of dynamic data, to receive data to enable their function, or conversely to provide data to other vehicles/infrastructure to enable their *C-ITS*s to function.

C-ITS as an entity, is therefore the *functionality that enables* such 'cooperative' and collaborative exchange of data, and in some cases, collaborative control, or even decision making, that will enable applications to provide their services to one or more *actors* (3.1).

ISO/TR 17465-1 provides a summary definition of *C-ITS* as a "subset paradigm of overall *ITS* that communicates and shares information between *ITS-station*s to give advice or facilitate actions with the objective of improving safety, sustainability, efficiency and comfort beyond the scope of stand-alone systems".

ISO 17427-1 will provide descriptions of the roles and responsibilities of *actors* involved in the provision and use of *C-ITS*.

ISO/TR 17427-2 provides a framework overview which characterize the components of a *Cooperative-ITS* (*C-ITS*), its context and relevance for *ITS service* provision, and provides references to Standards deliverables where specific aspects of *C-ITS* are defined.

This Technical Report concerns the high-level generic requirements for the "Concept of operations" for a 'Core System' (*CorSys)* (3.10) to support *C-ITS* in a connected vehicle-highway system paradigm. It is agnostic in respect of technology and operates with whatever (and probably multiple) *communication*s technologies and hardware technologies that can support its functionalities.

The benefits of *Intelligent Co-operative Systems* (*C-ITS*) stem from the increased information that is available from the vehicle and its environment and from other vehicles. The same set of information can be used to extend the functionality of the in-vehicle safety systems and through vehicle-to-

infrastructure *communications* for more efficient traffic control and management. The benefits include the following:

— improved safety;

— increased road network capacity;

— reduced congestion and pollution;

— shorter and more predictable journey times;

— improved traffic safety for all road users;

— lower vehicle operating costs;

— more efficient logistics;

— improved management and control of the road network (both urban and inter-urban);

— increased efficiency of the public transport systems;

— better and more efficient response to hazards, incidents and accidents.

(source: EC project CVIS)

It is important to understand that *C-ITS* is not an end in itself, but a combination of techniques, protocols, systems and sub-systems to enable 'cooperative'/collaborative service provision in a connected vehicle-highway system paradigm.

Other parts in this family of *C-ITS* standards will define specific aspects of technology and behaviour, and the roles and responsibilities within the context of *C-ITS*.

This Technical Report is a 'living document' and as our experience with *C-ITS* develops, it is intended that it will be updated from time to time, as and when we see opportunities to improve this Technical Report.