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Intelligent transport systems - Cooperative ITS - Part 1: Roles and responsibilities in the context of co-operative ITS architecture(s) (ISO 17427-1:2018)

Intelligente Transportsysteme - Kooperative ITS - Teil 1: Rollen und Verantwortlichkeiten im Zusammenhang mit kooperativer(n) ITS-Architektur(en) (ISO 17427-1:2018)

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Systèmes intelligents de transport - Systèmes intelligents de transport coopératifs - Partie 1: Rôles et responsabilités dans le contexte des ITS fondés sur l'architecture (ISO 17427-1:2018)

Intelligente Transportsysteme - Kooperative ITS - Teil 1: Rollen und Verantwortlichkeiten im Zusammenhang mit kooperativer(n) ITS-Architektur(en) (ISO 17427-1:2018)

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European foreword

This document (EN ISO 17427-1:2018) has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" in collaboration with Technical Committee CEN/TC 278 "Intelligent transport systems" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2019, and conflicting national standards shall be withdrawn at the latest by January 2019.

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**Intelligent transport systems —
Cooperative ITS —**

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

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*Partie 1: Rôles et responsabilités dans le contexte des ITS fondés sur
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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).

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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

This first edition cancels and replaces ISO/TS 17427:2014 which has been technically revised.

A list of all the parts in the ISO 17427 series can be found on the ISO website.

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Introduction

Cooperative Intelligent Transport Systems (C-ITS) (3.8) are a promising advancement of Intelligent Transport Systems (ITS). Numerous applications, made possible only, or most efficiently, by the cooperation of *actors* (3.2) (other vehicles, the *infrastructure* (3.12), *service* (3.25) providers, even bystanders), are being devised that open up new possibilities to make traffic safer, more efficient and smarter. Technologies are being developed and improved to realize and support those new *services* and *applications* (3.3). But, to finally implement *C-ITS* and to achieve the benefits of greater safety and better mobility, multiple *actors* will have to cooperate with each other in a completely new way. *Actors* that have to date worked in isolation, i.e. in so called “silos”, will have to find a way to achieve these possibilities. New *actors* may also be required for the provision of some *services*. This requires a clear definition and assignment of *behaviours* (3.4), *responsibilities* (3.21) and liabilities. Therefore a general, abstract organizational architecture with the description of the single *roles* (3.22), their *behaviour*, and the corresponding *responsibilities*, is an essential prerequisite for the deployment of *C-ITS*.

The organizational relationships with the description of roles and responsibilities, is a crucial part of the whole *C-ITS* architecture. *C-ITS* is not an objective in itself, it is a means to achieve the potential of service provision through the cooperation of *actors* involved in the ITS sector. The architectural viewpoint comprising the organizational architecture has extensive influences on the deployment and implementation of *C-ITS*.

This document describes the high level roles and responsibilities of a *C-ITS* service provider and aligns it with other *C-ITS* standards and specifications.

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Intelligent transport systems — Cooperative ITS —

Part 1:

Roles and responsibilities in the context of co-operative ITS architecture(s)

1 Scope

This document contains a detailed description of the (actor invariant) *roles* (3.22) and *responsibilities* (3.21) required to deploy and operate *Cooperative-ITS (C-ITS)* (3.8). The organization/organization of actors / roles described in this document are designed to be appropriate for any fully operational system that uses the *C-ITS* concepts and techniques in order to achieve its service provision. This document is presented in terms of an organizational or *enterprise viewpoint* (3.10) as defined in ISO/IEC 10746-1.

This document is for all types of road traffic of all classes, and for any other actors involved in the provision of applications and services which use *C-ITS* techniques to achieve service provision. The description of roles is technology agnostic and, in terms of *C-ITS*, agnostic in respect of communication modes and embraces: vehicle-vehicle communications, vehicle-infrastructure communications and infrastructure-infrastructure communications.

This document provides a methodology for the identification of service specific roles and their corresponding responsibilities based on a process oriented approach. Additionally, the methodology is used to identify the roles and responsibilities for *C-ITS* in general. Both the methodology as well as the roles and responsibilities for *C-ITS* are deduced from ISO/IEC 10746-1, ISO/IEC 10746-2, ISO/IEC 10746-3, the reference model of Open Distributed Processing. Open Distributed Processing offers five viewpoints of which the *enterprise viewpoint* corresponds with the organizational architecture and its *roles* and *responsibilities*.

To limit the scope of the document to the core of *C-ITS*, the *roles* are separated into external and internal. Considered to be internal are all roles that are highly relevant for the purpose of achieving service provision by means of *C-ITS*. Considered to be external are all roles involved in *C-ITS*, but not set up only for the purpose of *C-ITS*.

This document provides a description of a high-level architectural viewpoint on *C-ITS*. It is designed to be used as a blueprint when implementing service provision systems that use *C-ITS*, and the corresponding organizational structures. The characteristics of *C-ITS* entail a huge number of data/information exchanges. Therefore the implementation stringently respects privacy and data protection as it is defined in ISO/TR 12859 and in national laws and regulations (where instantiated). Privacy and data protection affects all roles defined in this document due to these characteristics and all actors occupying roles in *C-ITS* respects the corresponding standards and regulations.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TR 12859:2009, *Intelligent transport systems — System architecture — Privacy aspects in ITS standards and systems*

ISO 14817-2, *Intelligent transport systems — ITS central data dictionaries — Part 2: Governance of the Central ITS Data Concept Registry*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1 action

something which happens; the fact or *process* (3.18) of doing something

EXAMPLE Typically to achieve an aim.

[SOURCE: ISO/IEC 10746-2, 8.3]

3.2 actor

person or organizational unit playing a coherent set of *roles* (3.22) when interacting with the system within a particular use case

[SOURCE: ISO 24014-1:2015, 2.2]

3.3 application app

software based mechanism of delivering some or all parts of a service (3.25)

[SOURCE: ISO 14813-1, 3.2]

3.4 behaviour

collection of *actions* (3.1) with a set of constraints on when they may occur

[SOURCE: ISO/IEC 10746-2, 8.7]

3.5 bounded secure managed domain BSMD

ITS-S (3.15) *application* (3.3) *processes* (3.18) which function within a controlled environment comprised of an *ITS-S* facilities layer, *ITS-S* networking & transport layer, *ITS-S* access layer, *ITS-S* management entity and *ITS-S* security entity, which adhere to a minimum set of security principles and procedures so as to establish a level of trust between itself and other similar *ITS stations* (3.15) with which it communicates

3.6 client

party which instigates/authorizes the provision of an *ITS service* (3.14)

3.7 community

configuration of *objects* (3.17) formed to meet an objective

[SOURCE: ISO 10746-3, 5.1.1]

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3.8**Cooperative-ITS
C-ITS**

subset of overall ITS that communicates and shares information between *ITS stations* (3.15) to provide, exchange, or receive, data, give advice or facilitate actions with the objective of improving safety, sustainability, efficiency and comfort beyond the scope of stand-alone systems

Note 1 to entry: As an alternative to a “subset”, Cooperative-ITS could be viewed as a “paradigm” in overall ITS.

[SOURCE: ISO/TR 17465-1, 2.1]

3.9**enterprise object**

object (3.17) in *enterprise viewpoint* (3.10)

3.10**enterprise viewpoint**

viewpoint on an open distributed processing (ODP) system and its environment that focuses on the purpose, scope and policies for that system

[SOURCE: ISO/IEC 10746-3, 4.1.1.1]

3.11**external enterprise object**

enterprise object (3.9) involved in C-ITS but not set up for the only purpose of C-ITS

3.12**infrastructure**

system of facilities, equipment and *services* (3.25) needed for the operation of an organization

Note 1 to entry: C-ITS specific: static part of C-ITS incorporating sensors, actuators, static *ITS Station(s)* (3.15).

[SOURCE: ISO 9000:2015, 3.5.2] <https://standards.iteh.ai/catalog/standards/sist/b796a3ee-737d-4ec5-a97c-9c78f177da68/sist-en-iso-17427-1-2018>

3.13**internal enterprise object**

enterprise object (3.9) within C-ITS set up only as an internal C-ITS mechanism to enable or support the provision of an *ITS service* (3.14) via C-ITS

3.14**ITS service**

provides benefits to its *service recipient* (3.28)

3.15**ITS Station****ITS-S**

entity in a communication network, comprised of *applications* (3.3), facilities, networking and access layer components that operate using regular wireless communications interface security, or may operate within a *bounded secure management domain* (3.5)

3.16**data lifecycle process**

process (3.18) based on data element transformation

3.17**object**

model of an entity, characterized by its *behaviour* (3.4) and dually by its state, distinct from any other object, encapsulated, i.e. any change in its state can only occur as a result of an internal *action* (3.1) or as a result of an interaction with its environment

[SOURCE: ISO/IEC 10746-2, 8.1]