SLOVENSKI STANDARD
SIST-TP CEN/TR 16690:2014

01-december-2014

Elektronsko pobiranje pristojbin (EFC) - Smernice za aplikacije EFC na podlagi v vozila vgrajenih postaj ITS

Electronic fee collection - Guidelines for EFC applications based on in-vehicle ITS stations

Leitfaden zur elektronischen Gebührenerhebung (EFC) - Anwendungen basierend auf fahrzeuginternen ITS Stationen

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Perception de télépéage - Lignes directrices concernant les applications de perception de télépéage basées sur des stations de systèmes de transport intelligents embarquées à bord des véhicules

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

Ta slovenski standard je istoveten z: **CEN/TR 16690:2014**

ICS:

35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade

SIST-TP CEN/TR 16690:2014 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

SIST-TP CEN/TR 16690:2014

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 16690

July 2014

ICS 35.240.60

English Version

Electronic fee collection - Guidelines for EFC applications based on in-vehicle ITS stations

Perception de télépéage - Lignes directrices pour les applications de télépéage installées dans les stations de systèmes de transport intelligents (ITS) embarquées dans les véhicules

Elektronische Gebührenerhebung - Richtlinien für Anwendungen der Elektronischen Gebührenerhebung basierend auf fahrzeuginternen IVS Geräten

This Technical Report was approved by CEN on 10 May 2014. It has been drawn up by the Technical Committee CEN/TC 278.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2014 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. CEN/TR 16690:2014 E

SIST-TP CEN/TR 16690:2014

Contents

Page

Foreword 5

Introduction 6

1 Scope 8

2 Normative references 8

3 Terms and definitions 9

4 Symbols and abbreviations 12

5 Context of C-ITS 13
5.1 Definition of C-ITS 13
5.1.1 Introduction 13
5.1.2 The European Commission basic definition 14
5.1.3 The vehicle active safety viewpoint 14
5.1.4 The CEN/ETSI/ISO definition 14
5.2 C-ITS role model and business architecture 15
5.2.1 Role model 15
5.2.2 Business architecture 17
5.3 Technical architecture 19
5.3.1 ITS Station architecture 19
5.3.2 ITS communication access technologies 20
5.3.3 Application provisioning and life cycle management 22
5.3.4 Security 23
5.4 Legal aspects and background 23
5.4.1 European action plan and directive for ITS 23
5.4.2 User privacy and data protection 24
5.4.3 Liabilities regarding application performance / suitability for use 24
5.5 Overview of standardization activities 24
5.5.1 Introduction 24
5.5.2 Basic set of ITS applications 25
5.5.3 CEN/TC 278/WG 16 on cooperative systems 26
5.5.4 ISO/TC 204/WG 18 on cooperative systems 26
5.5.5 ISO/TC 204/WG 16 on wide area communications/protocols and interfaces 27
5.5.6 ETSI Technical Committee on ITS (ETSI TC ITS) 27
5.6 Overview of R&D projects and other relevant initiatives 27
5.6.1 CVIS project on cooperative vehicle infrastructure systems 27
5.6.2 SAFESPOT project on road safety related applications 28
5.6.3 eCoMove project on road transport efficiency applications 29
5.6.4 DRIVE C2X project with focus on field trials 29
5.6.5 Car-to-car communication consortium (C2C-CC) 29
5.6.6 EasyWay project on applications for the major EU road network 30
5.6.7 COMeSafety and COMeSafety2 projects on road safety applications 30
5.6.8 Amsterdam Group 30

6 Context of EFC 30
6.1 Definition of EFC 30
6.2 EFC role model and business architecture 31
6.2.1 Role model 31
6.2.2 Business architecture 32
6.3 Technical architecture 33
6.3.1 Overview 33
6.3.2 Communication architecture 35

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

6.3.3 Autonomous OBE / Front End implementation 36
6.3.4 EFC security 37
6.4 Additional major aspects 38
6.4.1 Interoperability 38
6.4.2 Value added services based on EFC OBE 38
6.4.3 EFC outside Europe 40
6.5 Legal aspects and background 41
6.5.1 Toll domain specific 41
6.5.2 European Electronic Toll Service (EETS) 41
6.5.3 User privacy and data protection 42
6.6 Overview of standardization activities 42
6.6.1 CEN/TC 278/WG 1 on Electronic fee collection and access control applications 42
6.6.2 ISO/TC 204/WG 5 on electronic fee collection and access control applications 42
6.6.3 ETSI Technical Committee for ITS (ETSI TC ITS) 42
6.7 Examples of commercial projects 43
6.7.1 Small EFC system: Herrentunnel Lübeck (Germany) 43
6.7.2 Nationwide EFC system: Germany 43
6.7.3 Interoperable EFC system: EasyGo 44

7 Outline of EFC requirements to an ITS Station 44
7.1 High level EFC requirements 44
7.2 Requirements for the EFC application(s) 46
7.2.1 Detection of Charge Objects (autonomous toll domains) 46
7.2.2 Provision of charge reports (autonomous toll domains) 47
7.2.3 Fee calculation (autonomous toll domains) 48
7.2.4 Generation of charge data (DSRC based toll domains) 48
7.2.5 Location support (autonomous toll domains) 49
7.2.6 Support of enforcement application 49
7.2.7 Operation of an enforcement application 49
7.2.8 Changing variable tariff parameters 50
7.2.9 Feedback to the road user 50
7.3 Resulting requirements for the ITS Station 51
7.3.1 Technical requirements 51
7.3.2 Security requirements 55
7.3.3 Operational requirements 58

8 EFC services in the C-ITS environment 60
8.1 EFC services on ITS Stations 60
8.2 Involved C-ITS sub-roles in the life cycle of EFC services 61
8.2.1 Life cycle of EFC services 61
8.2.2 C-ITS sub-roles involved in different phases of the EFC service life cycle 62
8.3 Combined models of EFC services in C-ITS context 66
8.3.1 C-ITS and EFC role model relations 66
8.3.2 Technical EFC architecture in C-ITS context 68
8.3.3 ITS Station Service Provider 70
8.3.4 Extended EFC role model in C-ITS environment 70
8.3.5 Business architecture 71

9 Considerations on particular implementation aspects 72
9.1 Introduction 72
9.2 Synergies 73
9.3 Particular and critical areas in relation to EFC in an ITS environment 74
9.3.1 Phase of migration from dedicated EFC devices to ITS-S based EFC 74
9.3.2 Resource management 77
9.3.3 Performance monitoring 80
9.4 Suitability for use and certification 81
9.4.1 Introduction 81
9.4.2 Conformity to specifications 82

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6e8ec690-6bda-497f-a4b7-b2e0e1f3d2ef/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

9.4.3 Suitability for use tests 83
9.4.4 Certification 83
9.4.5 Registration and Certification Authority 84
9.4.6 Quality system approval und surveillance 85
9.5 Governance and responsibility 85
9.5.1 Introduction 85
9.5.2 Application configuration of the ITS Station 86
9.5.3 Technical implementation of the ITS Station 87
9.5.4 Update and installation of applications 88

10 Guidelines for further work 89
10.1 Role of EFC to boost the deployment of C-ITS 89
10.2 Actions to reduce barriers for the deployment of EFC applications — Create harmonized certification and test rules 90
10.2.1 Introduction 90
10.2.2 Issuing test rules 90
10.2.3 Guidelines on certification and tests 91
10.3 Recommendations for further standardization activities 91
10.3.1 Recommendations with regard to the area of EFC 91
10.3.2 Recommendations with regard to the area of (C-)ITS 93
10.4 Best practice 94

Annex A (informative) Security Considerations 95

A.1 Introduction 95
A.1.1 Security areas and targets 95
A.1.2 System and application availability and reliability 95
A.1.3 Data security 95
A.1.4 User privacy protection 96
A.2 Security scope of this annex 96
A.3 General EFC security considerations 96
A.3.1 Security analysis 96
A.3.2 Security system 98
A.3.2.1 General 98
A.3.2.2 Technical security architecture 98
A.3.2.3 Organisational security architecture 98
A.4 System and application availability and reliability 99
A.5 Security of an ITS Station 100
A.5.1 General 100
A.5.2 Closed ITS Station application platform 100
A.5.3 Open ITS Station application platform 101
A.6 Summary 101

Bibliography 102

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b726006781d0/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

Foreword

This document (CEN/TR 16690:2014) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

A CEN Technical Report is a document adopted by CEN/CENELEC containing informative material not suitable for publication as a European Standard or a Technical Specification.

This document has been prepared by CEN/TC 278/WG 1, Project Team 136. The work done by the project team has been governed by the Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN, and by CEN/TC 278/WG 1, Electronic fee collection and access control (EFC).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

Introduction

Increasingly, tolling systems are becoming automated and electronic fee collection (EFC) is becoming a pervasive service in Europe. The widespread deployment of EFC systems requires provisions to allow users to employ a single contract and a single OBE to circulate through many different toll domains. In Europe, for example, this need has been officially recognized and legislation on interoperability has already been adopted in the form of the Interoperability Directive 2004/52/EC and the EETS Decision 2009/750/EC.

Standardization in the context of Electronic Fee Collection has been active since the early '90s with the aim of providing the architecture and the definition of interoperable interfaces for interoperable tolling systems. Interoperable interfaces allow tolling systems to exchange information and make mutual use of it. Specifications of such interfaces have been provided in the form of Application Interface Definitions, which are to be considered as toolboxes for defining application protocols and application data exchanged. In many cases, interoperable application profiles have been defined to narrow down the options and provide a sound basis for interoperability.

The standardization results have major relevance for the future of the EETS. Some standards are directly referenced by the EETS Decision and are hence of mandatory application. Other standards provide open and interoperable definitions which are likely to be employed to fulfil the requirement that: “EETS equipment shall be designed in such a manner that its interoperability constituents utilise open standards”.

EFC is one of the intelligent transport systems (ITS) applications with the widest deployment. Currently EFC equipment is mostly dedicated to one or a few applications only. On the one hand, EFC equipment is also becoming more capable and EFC OBE may provide platforms for delivering selected Value Added Services as analysed in CEN/TR 16219. On the other hand, future ITS Stations may in principle deliver the EFC Service to users, if certain requirements are fulfilled.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This Technical Report mainly provides a view on how “both worlds”, the established and wide-spread EFC services and the emerging ITS services and platforms, could be combined to future solutions in which EFC services are considered as one service amongst others offered by ITS. The Report provides information to designers of ITS about the nature and specialities in the EFC services to be taken into account. It also provides EFC stakeholders with guidance how an integration of EFC into the set of services provided in the ITS environment may be achieved.

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

In order to identify the guidelines how EFC applications can be provided on ITS in-vehicle stations, the following approach is chosen:

— provide a view and understanding of both EFC and cooperative ITS in terms of available architectures, definitions, specifications, stakeholders and operational experiences (commercially available projects as well as research and trial activities);

— identify major EFC requirements that will have an impact to the ITS Station;

— provide a view as to how EFC roles and functionalities (according to ISO 17573) shall be enabled and supported in the cooperative ITS context (in different phases of the entire life cycle of an EFC service);

— identify a base technical architecture that enables EFC services in an ITS context;

— analyse stakeholders in a business architecture and provide an example of a business architecture for EFC services in an ITS environment; and

— emphasize on particular key areas like conformance and certification, potential synergies in the context of the ITS Station, areas of major concern, governance, critical elements.

This approach could be chosen as the EFC environment is seen very mature in terms of architectural, technical and operational requirements and processes. EFC as a service is already in use in various

SIST-TP CEN/TR 16690:2014

commercial projects in many countries throughout the world. Operational experiences have already been taken into account in refining the landscape of existing specifications in EFC. This can be seen as an extraordinary condition compared to other (future) ITS services for which such mature environmental and context is not yet available

ETSI TC ITS has defined a Basic Set of Applications in ETSI/TR 102 638 which is expected to be deployed relatively swiftly after completion of standardization of C-ITS. EFC is directly addressed in this Basic Set of Applications and considered as a primary application. Standardization of the EFC application requirements is, however, within the scope of CEN/TC 278/WG 1, which is in charge of defining the requirements for the EFC use cases in accordance with the set of standards developed by this Working Group.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

1 Scope

This Technical Report (TR) contains an analysis of the technical and operational feasibility of using a generic ITS Station as specified in ETSI EN 302 665, *Intelligent Transport Systems (ITS); Communications Architecture*, for EFC applications compliant to the requirements specified in ISO 17573, EN ISO 12855, CEN ISO/TS 17575 (all parts), EN ISO 14906, EN 15509, CEN ISO/TS 12813, CEN ISO/TS 13141 and CEN/TS 16439.

The scope of this Technical Report includes:

— description of the context of Cooperative ITS and the ITS Stations;

— providing details of the context of EFC applications;

— outlining the basic architectural concepts and role model of both EFC and Cooperative ITS;

— identification of core requirement areas for operation of an EFC application on an ITS Station;

— specification of a set of recommendations for functional, operational and security requirements to the ITS Station supporting the EFC application(s);

— description of a possible role model in which the roles known in EFC applications make use of the roles in the C-ITS system in order to provide EFC services in an C-ITS context;

— provision of considerations in particular areas of EFC like certification and governances;

— guideless and recommendations for further standardization work in this area;

— emphasizing on security related elements of EFC that need to be considered in a C-ITS environment.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b726006781d0/sist-tp-cen-tr-16690-2014

The scope of this Technical Report is limited to in-vehicle ITS Stations. However, an EFC service always requires the involvement of in-vehicle and central functionalities. Furthermore, for enforcement purposes as well as in DSRC based toll domains for toll charging purposes also, it is essential that road-side based functions are provided and operated. In order to facilitate EFC services a set of functionalities, tasks and responsibilities are defined and specified in an EFC role model (ISO 17573). These functionalities, tasks and responsibilities are shared between the roles Toll Charger, Toll Service Provider, Road User and Interoperability Management. All these roles interact with each other. As a consequence this Technical Report provides in various areas explanations that are beyond the in-vehicle environment. This is required in order to present the full environment and context. It keeps the readability of this document at a sound level and provides valuable information to those readers which are not yet familiar with EFC in detail.

Outside the scope of this Technical Report is:

— detailed technical specifications for EFC services and applications on C-ITS systems;

— implementation specific elements.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 15509, *Road transport and traffic telematics - Electronic fee collection - Interoperability application profile for DSRC*

SIST-TP CEN/TR 16690:2014

CEN ISO/TS 12813, *Electronic fee collection - Compliance check communication for autonomous systems (ISO/TS 12813)*

EN ISO 12855:2012, *Electronic fee collection - Information exchange between service provision and toll charging (ISO 12855:2012)*

CEN ISO/TS 13141, *Electronic fee collection - Localisation augmentation communication for autonomous systems (ISO/TS 13141)*

EN ISO 14906, *Electronic fee collection - Application interface definition for dedicated short-range communication (ISO 14906)*

CEN ISO/TS 17575-1:2010, *Electronic fee collection - Application interface definition for autonomous systems - Part 1: Charging (ISO/TS 17575-1:2010)*

CEN ISO/TS 17575-2, *Electronic fee collection - Application interface definition for autonomous systems - Part 2: Communication and connection to the lower layers (ISO/TS 17575-2)*

CEN ISO/TS 17575-3:2011, *Electronic fee collection - Application interface definition for autonomous systems - Part 3: Context data (ISO/TS 17575-3:2011)*

CEN ISO/TS 17575-4:2011, *Electronic fee collection - Application interface definition for autonomous systems - Part 4: Roaming (ISO/TS 17575-4:2011)*

ISO 17573:2010, *Electronic fee collection — Systems architecture for vehicle-related tolling*

iTeh STANDARD PREVIEW

3 Terms and definitions

(standards.iteh.ai)

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

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

3.1
back end
computing and communication facilities of an actor (e.g. a Toll Charger or a Toll Service Provider) exchanging data with a Front or Back End

3.2
back office
generic name for the centrally located computing and communication facilities (of a role involved in EFC)

3.3
charge report
information containing road usage and related information originated at the Front End

3.4
cooperative ITS
subset of the overall ITS that communicates and shares information between ITS Stations to give advice or facilitate actions with the objective of improving safety, sustainability, efficiency and comfort beyond the scope of stand-alone systems

[SOURCE: ISO/DTR 17465]

3.5
electronic fee collection
fee collection by electronic means

SIST-TP CEN/TR 16690:2014

3.6
front end
part(s) of the toll system where road usage data for an individual road user are collected, processed and delivered to the Back End

Note 1 to entry: The Front End comprises the on-board equipment and an optional proxy.

[SOURCE: CEN ISO/TS 17575-1:2010, 3.13]

3.7
interoperability management
role that manages the toll charging environment, i.e. defining and maintaining a set of rules that, taken together, defines the policy of a given toll regime or of the overall toll charging environment

3.8
ITS application
association of two or more complementary ITS-S applications

[SOURCE: ETSI EN 302 665 V1.1.1 (2010-09)]

3.9
ITS service
service provided by an ITS application to the user of ITS

[SOURCE: ETSI EN 302 665 V1.1.1 (2010-09)]

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.10
ITS station
entity in a communication network that executes ITS-S applications within a bounded, secured, managed domain 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

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

Note 1 to entry: From an abstract point of view, the term “ITS station” refers to a set of functionalities. The term is often used to refer to an instantiation of these functionalities in a physical unit. The appropriate interpretation is clear from the context. The physical instantiation of an ITS-S is named ITS station unit (ITS-SU).

[SOURCE: ISO 21217:2010]

3.11
ITS station service provider
role that is responsible for procuring an ITS Station (ITS-S), arranging the installation of such ITS-S in vehicles and maintains an ITS-S

Note 1 to entry: This role offers ITS Service providers to host their services on this ITS-S.

3.12
ITS station unit
implementation of an ITS-S

[SOURCE: ISO 21217:2010]

3.13
on-board equipment
equipment located on-board a vehicle including nomadic devices with the function of exchanging information with external systems

SIST-TP CEN/TR 16690:2014

3.14
policy framework
role that is responsible for all governing and institutional activities required in the system

[SOURCE: prCEN ISO/TS 17427]

3.15
system management
role that is responsible to fulfil all required management activities within the system, this especially includes activities supporting the role 'System Operation'

[SOURCE: prCEN ISO/TS 17427]

3.16
system operation
role that is responsible for the proper execution of the applications that provide the end-to-end service(s)

[SOURCE: prCEN ISO/TS 17427]

3.17
toll charger
entity which levies toll for the use of vehicles in a toll domain

Note 1 to entry: In other documents the terms operator or toll operator may be used.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.18
toll context data
information defined by the responsible toll charger necessary to establish the toll due for using a vehicle on a particular toll context and to conclude the toll transaction

SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

3.19
toll declaration
statement to declare the usage of a given EFC service to a toll charger

3.20
toll domain
area or a part of a road network where a certain toll regime is applied

3.21
toll service provider
entity providing toll services in one or more toll domains

Note 1 to entry: In other documents the terms issuer or contract issuer may be used.

Note 2 to entry: The Toll Service Provider may provide the OBE or may provide only a magnetic card or a smart card to be used with OBE provided by a third party (like a mobile telephone and a SIM card can be obtained from different parties).

Note 3 to entry: The Toll Service Provider is responsible for the operation (functioning) of the OBE with respect to tolling.

3.22
trusted recorder
logical entity capable of cryptographic functions, used to provide the OBE with security services, including data confidentiality, data integrity, authentication and non-repudiation

SIST-TP CEN/TR 16690:2014

4 Symbols and abbreviations

For the purpose of this document, the following abbreviations apply throughout the document unless otherwise specified.

ANPR	Automatic Number Plate Recognition
BSDM	Bounded Secure Management Domain
C2C-CC	Car-to-Car Communication Consortium
CALM	Communication Architecture for Land Mobiles
CALM FAST	CALM network protocol stack
C-ITS	Cooperative ITS
CMC	Configuration Management Centre
CVIS	Cooperative Vehicle Infrastructure Systems
CN	Cellular Network
DSRC	Dedicated Short Range Communication
EAL	Evaluation Assurance Level
EC	European Commission
ECU	Electronic Control Unit
EETS	European Electronic Toll Service
EFC	Electronic Fee Collection
EGNOS	European Geostationary Navigation Overlay Service
ESO	European Standardization Organization(s)
ETSI ITS-G5	Access layer specification for ITS operating in the 5 GHz frequency band (Draft ETSI EN 302 663)
ETSI TC ITS	ETSI Technical Committee on ITS
EU7FP	7th framework program (2007 – 2013) of the European Commission
FNTP	Fast Networking and Transport layer Protocol
GLONASS	Globalnaya Navigatsionnaya Sputnikovaya Sistema (or Global Navigation Satellite System)
GNSS	Global Navigation Satellite System
GST	Global System for Telematics
HGV	Heavy Good Vehicle
HMC	Host Management Centre
HMI	Human Machine Interfaces
I2I	Infrastructure-to-Infrastructure
ITS	Intelligent Transport Systems
ITS-S	ITS Station
ITS-S SP	ITS Station Service Provider
ITS-SU	ITS Station Unit
KPI	Key Performance Indicator
LAC	Localization Augmentation Communication

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72b0067 8fd0/sist-tp-cen-tr-16690-2014

SIST-TP CEN/TR 16690:2014

LDM	Local Dynamic Map
OBE	On Board Equipment
OEM	Original Equipment Manufacturer
OSGi	Open Services Gateway Initiative
PC	Personal Computer
PKI	Public Key Infrastructure
RSE	Road Side Equipment
R&TTE	Radio and Telecommunications Terminal Equipment
SAM	Secure Application Module
SDO	Standardization Developing Organization(s)
SLA	Service Level Agreement
TC	Toll Charger
TD	Toll Domain
TEN-T	Trans-European Transport Network
TR	Technical Report
TS	Technical Specification
TSP	Toll Service Provider
VAS	Value Added Services
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle
WLAN	Wireless local area network

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST-TP CEN/TR 16690:2014
https://standards.iteh.ai/catalog/standards/sist/6c8ec690-6bda-497f-a4b7-b72600678fd0/sist-tp-cen-tr-16690-2014

5 Context of C-ITS

5.1 Definition of C-ITS

5.1.1 Introduction

Cooperative System(s) or Cooperative ITS (C-ITS) is being proposed as a new paradigm in ITS, but its exact definition sometimes remains unclear and is not agreed upon by all stakeholders. The most common understanding is that C-ITS involves vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication to enhance safety and efficiency of the road transport system. C-ITS is also considered as a mean to get away from the multitude of proprietary stand-alone devices invading the driver environment. The feeling was that it is not sustainable to put a new box with antennas, display, keyboard, etc. for each new application that was going into the car. This is too costly, too unsafe, does not give interoperability, and is just not safe or sustainable from a windshield real estate point of view.

As a consequence ITS has to evolve from “silos” or vertical integration of all functions for each new application, into a new world of sharing common resources where useful and possible.

The definition of what a cooperative system is has proven to be difficult. There are several reasons for this. A major reason is the existence of a plethora of organizations and projects within the field, each deriving their own definition. This can mostly be attributed to historical reasons, but it has also been influenced by turf wars and commercial pressures from actors in existing markets feeling threatened by this new world. The result is that currently several definitions of C-ITS exist.