SLOVENSKI STANDARD
SIST-TS CEN ISO/TS 17573:2003

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Cestna transportna in prometna telematika – Elektronsko pobiranje pristojbin – Sistemska arhitektura za transportne storitve v zvezi z vozili (ISO/TS 17573:2003)

Road Transport and Traffic Telematics - Electronic Fee Collection (EFC) - System architecture for vehicle related transport services (ISO/TS 17573:2003)

Straßentransport- und Verkehrstelematik - Elektronische Gebührenerhebung (EFC) - Systemarchitektur für fahrzeugbezogene Transportdienste (ISO/TS 17573:2003)

Télématique de la circulation et du transport routier (RTTT) - Perception du télépéage - Architecture des systemes pour les services embarqués sur véhicules (ISO/TS 17573:2003)

Ta slovenski standard je istoveten z: **CEN ISO/TS 17573:2003**

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

SIST-TS CEN ISO/TS 17573:2003 **en**

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TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN ISO/TS 17573

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ICS 35.240.60

English version

Road Transport and Traffic Telematics – Electronic Fee Collection (EFC) – System architecture for vehicle related transport services (ISO/TS 17573:2003)

Télématique de la circulation et du transport routier (RTTT) – Perception du télépéage – Architecture des systèmes pour les services embarqués sur véhicules (ISO/TS 17573:2003)

This Technical Specification (CEN/TS) was approved by CEN on 25 November 2002 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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CEN ISO/TS 17573:2003 (E)

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Foreword

This document (CEN ISO/TS 17573:2003) has been prepared by Technical Committee CEN/TC 278, "Road Transport and Traffic Telematics" the secretariat of which is held by NEN in collaboration with Technical Committee ISO/TC 204, "Transport information and control systems".

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

There are several standards covering the sector of Electronic Fee Collection (EFC) within Road Transport and Traffic Telematics (RTTT). Most of the standards are related to the different interfaces that are found in EFC systems, but with few or no references to other EFC standards. Due to this a need has arisen for an 'umbrella' or Architecture standard for EFC.

The objective of this standard is to define a reference system architecture for EFC used for vehicle related transport services. The standard provides a framework of conditions for EFC that should be considered during the specification and implementation. The given information is technology independent as far as possible to enable various forms of EFC systems. Specific details with regard to e.g. payment means, communication medium and design of equipment are intentionally kept out of the scope.

The standard provides details with regard to following aspects:

— Terminology, definitions;

— List of relevant standards, regulations and other relevant documents;

— Architecture model for EFC with regard to all relevant parties and facilities (entities);

— Identification of interfaces, including references to relevant (Pre-)standards / Technical Specifications;

EFC encompasses all systems designed to collect fees from users in a non-manual way for vehicle related transport services. Generally EFC is characterised by the use of electronic means of payment, by absence of any action from the user at the moment that payment or transaction is made and that payment or transaction for the transport service may be collected whether or not the vehicle is moving or stationary. EFC does not exclude manual payment, conventional money transaction, nor does it include payment by means of sticker, vignettes, tickets, or magnetic stripe cards etc.

The applications to which EFC is related are Toll Collection, Road Pricing, Parking and Individual Traveller and Traffic Information. EFC systems for public passenger transport or comparable applications that do not require vehicle related EFC equipment are excluded.

Vision

To provide enabling standards for the collection of fees from road users by automatic means, primarily by use of an air interface.

Mission

It is the mission of this standard to describe the overall system architecture for Electronic Fee Collection with the Road Transport and Traffic Telematics.

1 Scope

This Technical Specification specifies a system architecture for electronic fee collection (EFC) systems concerning vehicle related transport services such as the use of toll roads, zone access, parking and route guidance.

This Technical Specification does not cover person related transport services such as public transport. However, some of the clauses in this standard may also be applicable for fare collection.

NOTE   Fare collection architecture in public transport is covered by other Working Groups in CEN/TC278 and ISO/TC204, e.g. WG3 Public Transport in CEN/TC278.

This Technical Specification provides the overview of, and inter-relationship among, the set of standards for design, development, testing and operation of applications in the field of EFC.

This Technical Specification is also applicable to the ITS Fundamental Service called Electronic Financial Transactions which is the use of electronic, or 'cashless' payment systems for transportation. Hence, this standard covers toll collection systems, parking fee collection systems, systems for road and congestion pricing and integrated payment systems for transport services.

2 Normative references

This Technical Specification incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Technical Specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

prCEN ISO/TS 17574   *Road Transport and Traffic Telematics (RTTT) - Electronic Fee Collection (EFC) System - – Security service Framework – Guidelines for EFC security protection profiles.*

ENV ISO 14904   *Road Transport and Traffic Telematics – Automatic fee collection (AFC) - - Interface specification for clearing between operators.*

ISO/IEC 11770-1 *Information technology – Security techniques - Key management - Part 1: Framework.*

3 Terms and definitions

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

3.1
actor
class external to the EFC system, e.g. the User and the Vehicle

3.2
availability (1)
definition related to Security: Data and information are available to authorised parties

3.3
availability (2)
definition related to operation of EFC systems: Dependability with respect to the readiness for usage. Measure of correct service delivery with respect to the alternation of correct and incorrect service

3.4
central account
account which is containing service rights and which is kept and administrated by the issuer of the payment means or by an entity acting on behalf of the issuer

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3.5
Central Communication Unit
part of the Central Equipment serving as mobile communication interface to the OBU

3.6
Central Equipment
system components at fixed centralised locations

NOTE   Central equipment is not the same as Central system. Central equipment is used in GNSS/CN based EFC systems.

3.7
charging point
physical point or zone where the use of the transport service is registered. In case of a DSRC based system the communication between the OBE/OBU and RSU takes place to exchange the information needed to charge the user by EFC. Charging point also covers the physical point or zone where a fee is collected manually

3.8
charging Point Equipment
equipment installed at a charging point, e.g. a toll station, enabling the operator to collect the fee by the different payment methods offered to the users

3.9
class
descriptor for a set of objects with similar structure, behaviour and relationships

3.10
class diagram
diagram that shows the classes of the system and their internal relationships (a static structure of a system)

3.11
classification
process of dividing vehicles into various classes according to certain classification parameters (e.g. weight, length, purpose of use, engine type, number of axles, actual number of passengers)

3.12
clearing Operator
entity that collects and possibly aggregates transactions from one or more Transport Service Providers for delivery to the Issuer(s). The Clearing Operator can also handle the Apportionment between the Transport Service Providers. In the financial world this operator is equivalent to an Acquirer

3.13
collection agent
entity responsible for selling, reloading or delivering the Payment Means to the User and collecting the payment from the User on behalf of the Issuer. The Collection Agent can also collect user related application specific data from the User. The Collection Agent is also referred to as Retailer

3.14
Conceptual Architecture
overall description of an EFC system incorporating operational concepts and user requirements, together with its known inter-relationships with other systems

3.15
confidentiality
sensitive data and information are available only to authorised parties (confidentiality of contents)

3.16
contract
expression of an agreement between two or more parties in a payment system or between payment systems. An example of a contract is the specific relationship between a User and an Issuer in a payment system where the contract may be explicit or implicit

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3.17
contractual interoperability
intention of operators to co-operate recorded in a contractual agreement

3.18
Declared Vehicle Characteristics
data set stored in the OBE/OBU containing vehicle characteristics of the vehicle the OBU is related to

3.19
Electronic Fee Collection
collection of a fee for a transport service where the fee is collected via the exchange of data, e.g. via an air-link communication, enabling the user to pay for the transport service with electronic values, e.g. an electronic purse or via a central account

3.20
Electronic Purse
application on an IC-card (integrated circuit card) or a similar device that can store, credit, debit and protect electronic values having their equivalent in money

3.21
enforcement
measures or actions performed by enforcement authorities or other organisations to achieve compliance with laws, rules and regulations

3.22
enforcement Operator
entity handling the enforcement of users

3.23
exception handling
process of dealing with system errors or passages that might possibly not be paid for. The outcome of the Exception handling might lead to that the user is enforced or that the fee can be collected, e.g. by correlating a pictured licence plate number with the contract register

3.24
Functional Architecture
description of the system in terms of functions and information flows between the functions

3.25
Integrity
sensitive data, information and message sequencing are guarded in such a way that any alteration or destruction by unauthorised parties is detected (integrity of contents, integrity of message sequence)

3.26
Interoperability
ability of systems to provide services to and accept services from other systems and to use these services to enable the systems to operate effectively together (see contractual, procedural and technical interoperability)

3.27
Issuer
entity responsible for the payment system and responsible for issuing the Payment Means to the User

3.28
Logical Architecture
determines the nature of the system as being based on Information, Control, or Functions, and describes the inter-relationships of these aspects. A logical architecture is independent of any hardware or software approach and can be described either from an Object oriented or Process oriented perspective

3.29
non-repudiation
protection against the denial, by one of the parties involved in the communication through the interface, of having participated in all or part of the communications

3.30
On-Board Account
account, which is containing service rights and which is being held under the responsibility of the user, e.g. data stored on an IC-card

3.31
On-Board Equipment
equipment located within the vehicle and supporting the information exchange with the Road Side Unit or the Central Communication Unit. It is composed of the On-Board Unit and other sub-units whose presence has to be considered optional for the execution of a Transaction

3.32
On-Board Unit (OBU)
minimum component of an On-Board Equipment, whose functionality always includes at least the support of the DSRC interface or/and the Central Communication Unit and the protection of the data stored in the OBU

3.33
Operator
generic term for the entities Issuer, Clearing Operator, Collection Agent, Transport Service Provider, Enforcement Operator or Trusted Third Party

3.34
payment means
expression of a Contract between the User and the Issuer (or via a Collection Agent) that allows the User to access the transport services available in the Payment System, e.g. an account in a credit card system or an Electronic Purse

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See also 5.2.

3.35
payment medium
carrier of payment means (such as ticket, card or on-board unit)

3.36
payment method
combination of a Payment Means, a Payment Mode and a Payment Scope

3.37
payment mode
parameter defining the time dimension in payment by the User, i.e. Pre-payment, Immediate payment or Post-payment

3.38
payment scope
application extent of the Payment Method, e.g. national transport or inter-sector

3.39
payment system
financial system that includes the complete process of issuing and use of payment means, clearing and settlement of transactions

See also 5.3.

3.40
Privacy
right of individuals to control or influence what information related to them may be collected and stored and by whom and to whom that information may be disclosed

3.41
procedural interoperability
existence of common data element definitions, the same working procedures and data delivery and common format of presentation in different sets of equipment required to communicate

3.42
Roadside Equipment
equivalent to Transport service Provider Equipment in those charging point where DSRC is used for communication between the On-Board Equipment and Transport service Provider Equipment, e.g. in a traditional toll station

3.43
Roadside Unit
DSRC part of the Roadside Equipment whose functionality is to communicate and exchange data with vehicles passing the charging point

3.44
Transport service
road Transport facility provided by a Transport Service provider. Normally a type of infrastructure, e.g. a toll road or a road network inside a toll ring

3.45
Transport service Provider iTeh STANDARD PREVIEW
person, company, authority or abstract entity offering a transport service to the User for which the user has to pay a fee (the fee will in some cases be zero, e.g. emergency vehicles) **(standards.iteh.ai)**

3.46
Transport service Provider Equipment
all equipment installed at the Charging point being used for EFC, e.g. communication equipment, classification systems, vehicle detection systems and signs and signals to the User

3.47
System Architecture
an overall description of an Electronic Fee collection system incorporating the main elements, the main interfaces and the main functions of the system

3.48
Technical interoperability
capability of different sets of equipment to work together through interconnection, co-ordinated execution or sharing of resources

3.49
Toll Collection System
equipment and functions enabling the collection of a fee for the use of road infrastructure

3.50
Toll Plaza
See **Charging point**

3.51
Toll Station
See **Charging point**

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3.52
Transport service
road transport related facility provided by a Transport service Provider. Normally a type of infrastructure, e.g. a toll toad or a road network inside a toll ring, the use of which is offered to the User for which the User is requested to pay

3.53
Trusted Third Party
entity who might be responsible for operation monitoring, system and security assessment (including security key management) as well as granting licences

3.54
User Equipment
any equipment held by the User enabling him to communicate with the collection agent updating his service rights, e.g. with a PC and a modem

3.55
User
(client, customer, consumer)
entity that uses a transport service provided by the Transport service Provider according to the terms of an agreement. The User may also be described as the subscriber of an EFC contract, the vehicle owner and the driver in those cases where these are not the same person or company

3.56
Use Case
abstraction of similar and closely connected scenarios where a scenario is a typical interaction between one or more actors and the EFC system

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EXAMPLE   Fee collection at the Charging point.

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3.57
Use Case Diagram

graphical model that shows the relationships among the actors and the use cases

4   Abbreviated terms

For the purposes of this Technical Specification the following abbreviated terms apply.

4.1
CN
Cellular Networks

4.2
CPE
Charging Point Equipment

4.3
DES
Data Encryption Standard

4.4
DSRC
Dedicated Short Range Communication

4.5
EFC
Electronic Fee Collection

4.6
GNSS
Global Navigation Satellite Systems

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