SLOVENSKI STANDARD
SIST EN ISO 17573-1:2019

01-november-2019

Elektronsko pobiranje pristojbin - Sistemska arhitektura za cestninjenje vozil - 1. del: Referenčni model (ISO 17573-1:2019)

Electronic fee collection - System architecture for vehicle related tolling - Part 1: Reference model (ISO 17573-1:2019)

Elektronische Gebührenerhebung - Systemarchitektur für fahrzeugrelevante Maut - Teil 1: Referenzmodell (ISO 17573-1:2019)

Perception du télépéage - Architecture de systèmes pour le péage lié aux véhicules (ISO 17573-1:2019)

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03.220.20	Cestni transport	Road transport
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

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EN ISO 17573-1

September 2019

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English Version

Electronic fee collection - System architecture for vehicle-related tolling - Part 1: Reference model (ISO 17573-1:2019)

Perception électronique du télépéage - Architecture de systèmes pour le péage lié aux véhicules - Partie 1: Modèle de référence (ISO 17573-1:2019)

Elektronische Gebührenerhebung - Systemarchitektur für fahrzeugrelevante Maut - Teil 1: Referenzmodell (ISO 17573-1:2019)

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European foreword

This document (EN ISO 17573-1:2019) 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of an identical text or by endorsement, at the latest by March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

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.

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Endorsement notice

The text of ISO 17573-1:2019 has been approved by CEN as EN ISO 17573-1:2019 without any modification.

INTERNATIONAL STANDARD

ISO 17573-1

First edition
2019-07

Electronic fee collection — System architecture for vehicle-related tolling —

Part 1: Reference model

Perception électronique du télépéage — Architecture de systèmes pour le péage lié aux véhicules —
Partie 1: Modèle de référence

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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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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 first edition of ISO 17573-1, cancels and replaces ISO 17573:2010, which has been technically revised.

The main changes compared to ISO 17573:2010 are as follows:

— update of the normative references, terms and definitions and abbreviated terms clauses and the Bibliography;

— relocation of previous Clause 8 (Information schemata and basic information types) to informative Annex B;

— removal of Clauses 9 (interfaces and computational objects) and 10 (Points of observation and view point correspondences), Annex A (Short Open Distributed Processing (ODP) description), Annex B (Comparison with ISO/TS 17573:2003), Annex C (Relations with this International Standard and IFMSA), Annex D (Relation with the European Electronic Tolls Service) and Annex E (Example of the Japanese electronic toll system);

— addition of the new informative Annex A (Mapping of the EFC architecture onto the C-ITS architecture) and Annex C (Enterprise objects within roles).

A list of all parts in the ISO 17573 series can be found on the ISO website.

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

The widespread use of tolling also requires provisions for users of vehicles that are roaming through many different toll domains. Users should be offered a single contract for driving a vehicle through various toll domains and those vehicles require on-board equipment (OBE) that is interoperable with the toll systems in the various toll domains. In Europe, for example, this need has been recognised and legislation on interoperability has been adopted (Directive 2004/52).

In addition to specialised standards there is also a need for a system architecture that:

— provides an architectural "umbrella" for other EFC standards in terms of a common definition of terms and concepts, basic system functionalities, and structure;

— provides a common terminology which supports its users to improve the quality of specifications to be used in an international market,

  — to reduce the risk for conflicting interpretations of specifications (purchaser) and descriptions (supplier),

  — to simplify the communication between experts from different continents, and

  — to enhance the potential use of other EFC standards;

— defines a common framework, which enables both:

  — identification of potential activities subject to standardization, and

  — maintaining a common and consistent view of the whole area;

— defines the boundaries between the EFC and external domains;

— identifies all architectural objects that lay inside the EFC boundaries;

— provides a basic understanding of EFC, EFC interoperability, and the EFC services being offered.

Toll systems conforming to this document may be used for various purposes including measured distance toll, road segment toll, closed network toll, cordon toll, area toll, time-based toll and collecting fees for the use of bridges, tunnels, ferries, or for parking.

ISO 17573:2010 was based on a conceptual model defined in ISO/TR 14904 (withdrawn standard). Since then ideas on conceptual models have evolved in several regional projects and implementations, e.g. in Japan and Europe. Those new models have been detailed to a further extent compared to ISO 17573:2010 and are closer to real life implementations. This document is based on these new conceptual models and uses the associated terms and definitions.

Although there are many differences, collecting a toll for vehicles can, to some extent, be compared with collecting a fare for public transport. Architectural harmonisation of the collection of fee and fare may be desirable from a policy and from a user point of view. In the past, ISO 24014-1 prepared by ISO TC 204 used ISO 17573:2010 as a starting point. This document has benefited from that and has also taken ISO 24014-1 into account.

In this document, the Open Distributed Processing (ODP) standard is used for the description of the architecture.

The ODP standard gives a vocabulary and modelling tools to see the architecture of a system from different perspectives (the viewpoints), in order to cover, e.g. hardware components as well as network protocols or interfaces or roles and general policies of the system itself. This is accomplished using different sets of concepts and terminologies, each one of those expressed as a viewpoint language. A complete description of a real system can only be achieved when all viewpoint models are designed. This allows for a clear separation of concerns and an easier way to define a system.

In more recent years, the development of concepts and standards in the field of Cooperative ITS (C-ITS, ISO TC 204 and CEN TC 278) led to the definition of a general enterprise viewpoint architecture for C-ITS (ISO 17427-1) that, by following the same approach of using the ODP architecture to model a complex system, defined concepts and terms for the more general realm of C-ITS.

This document gives a description of the architecture of the toll systems environment from the enterprise viewpoint, by refining and extending what had been already done in ISO 17573:2010. Correspondences between concepts and terms in this document and those in ISO 17427-1 are shown in Annex A. In addition, this document gives in Annex B the foundations of the information viewpoint by identifying information interactions and general information objects. With respect to ISO 17573:2010, this document removes all security requirements on interfaces, which are better and more generally dealt with in ISO 19299.

This document is Part 1 of a multipart standard that is made up of the following parts:

— ISO 17573-1, *Electronic fee collection — System architecture for vehicle related tolling — Part 1: Reference model* (this document)

— ISO/TR 17573-2[1)], *Electronic fee collection — System architecture for vehicle related tolling — Part 2: Terminology*

1) Under development. Current stage: 30.99

Electronic fee collection — System architecture for vehicle-related tolling —

Part 1: Reference model

1 Scope

This document defines the architecture of electronic fee collection (EFC) system environments, in which a customer with one contract may use a vehicle in a variety of toll domains with a different toll charger for each domain.

EFC systems conforming to this document can be used for various purposes including road (network) tolling, area tolling, collecting fees for the usage of bridges, tunnels, ferries, for access or for parking. From a technical point of view the considered toll systems may identify vehicles subject to tolling by means of electronic equipment on-board in a vehicle or by other means (e.g. automatic number plate recognition, ANPR).

From a process point of view the architectural description focuses on toll determination, toll charging, and the associated enforcement measures. The actual collection of the toll, i.e. collecting payments, is outside of the scope of this document.

The architecture in this document is defined with no more details than required for an overall overview, a common language, an identification of the need for and interactions among other standards, and the drafting of these standards.

This document as a whole provides:

— the enterprise view on the architecture, which is concerned with the purpose, scope and policies governing the activities of the specified system within the organization of which it is a part;

— the terms and definitions for common use in an EFC environment;

— a decomposition of the EFC systems environment into its main enterprise objects;

— the roles and responsibilities of the main actors. This document does not impose that all roles perform all indicated responsibilities. It should also be clear that the responsibilities of a role may be shared between two or more actors. Mandating the performance of certain responsibilities is the task of standards derived from this architecture;

— identification of the provided services by means of action diagrams that underline the needed standardised exchanges;

— identification of the interoperability interfaces for EFC systems, in specialised standards (specified or to be specified).

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/IEC 7498-1:1994, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model — Part 1*