INTERNATIONAL STANDARD

ISO 17573

First edition
2010-12-15

Electronic fee collection — Systems architecture for vehicle-related tolling

Perception du télépéage — Architecture de systèmes pour le péage lié aux véhicules

Reference number
ISO 17573:2010(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 17573 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with Technical Committee CEN/TC 278, *Road transport and traffic telematics*.

This second edition cancels and replaces the first edition (ISO/TS 17573:2003), which has been technically revised.

Introduction

The widespread use of tolling 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 system in the various toll domains. In Europe, for example, this need has been officially recognized and legislation on interoperability has already been adopted. See EFC Directive 2004/52/EC. There is a commercial and economic justification both in respect to the OBE and the toll systems for standards enabling interoperability.

In addition to other standards, there is also a further 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 enables its users

  — to improve the quality of specifications to be used in an international market,

  — to reduce the risk for different 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, that enables both

  — identification of potential activities subject to standardization, and

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

— defines the boundaries between the EFC and the external world;

— identifies all architectural objects that are within the EFC boundaries;

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

The previous edition of this International Standard was based on a conceptual model defined in ISO/TS 14904. 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/TS 17573:2003 and are closer to real-life implementations. This International Standard is based on these new conceptual models and uses the associated terms and definitions. A comparison between ISO/TS 17573:2003 and this edition is shown in Annex B.

Although there are many differences, collecting tolls for vehicles can be to some extent compared with collecting fares for public transport. Architectural harmonization of the collection of fees and fares can be desirable from a policy and from a user point of view. In the past ISO 24014-1 (prepared by CEN/TC 278 WG 3, Public Transport) used ISO/TS 17573:2003 as a starting point for their work. This International Standard has benefited from that and has also taken ISO 24014-1 into account.

In this International Standard 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 (viewpoints), in order to cover, for example, 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. A brief description of the ODP concepts can be found in Annex A.

This International Standard gives a description of the architecture of the toll systems environment from the enterprise viewpoint. In addition, this International Standard defines the foundations of the information viewpoint by defining information interactions and general information objects, and gives the basis for the computational view, by identifying needed computational objects and their interfaces.

Electronic fee collection — Systems architecture for vehicle-related tolling

1 Scope

This International Standard defines the architecture of a toll system environment in which a customer with one contract can use a vehicle in a variety of toll domains and with a different Toll Charger for each domain.

Toll systems covered by this International Standard can be used for various purposes including road (network) tolling, area tolling, collecting toll for bridges, tunnels, ferries, for access, and for parking. From a technical point of view the considered toll systems use electronic equipment on board a vehicle.

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 not included.

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

This International Standard 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,

— terms and definitions for common use in a toll environment,

— a decomposition of the toll systems environment into its main objects,

— the responsibilities of the main actors,

— an identification of the main interfaces between the main objects,

— an identification of the main flows of information between the main objects, and

— action diagrams reflecting the co-operation between the main actors.

2 Normative references

The following referenced documents are indispensable for the application 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, *Information Technology — Open systems interconnection reference model — Basic Reference Model: The Basic Model* (ITU-T Recommendation X.200, 1994)

ISO/IEC 10746-2, *Information technology — Open distributed processing — Reference model: Foundations* (ITU-T Recommendation X.902)

ISO/IEC 10746-3, *Information technology — Open distributed processing — Reference model: Architecture* (ITU-T Recommendation X.903)

ISO/IEC 15414, *Information technology — Open distributed processing — Reference model: Enterprise language* (ITU-T Recommendation X.911)