International

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Electronic fee collection — Information exchange between service provision and toll charging

Perception de télépéage — Échange d'informations entre la prestation de service et la perception du péage

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 12855:2022), which has been technically revised.

The main changes are as follows:

— the application data units (ADUs) have been revised;

— the data definitions and semantics have been updated, including making reference to ISO/TS 17573-2 as the primary source;

— the remaining references to the ISO 17575 series in 5.2.7 and in the Bibliography have been removed;

— the `MacKeyObject` has been removed from the `TrustobjectAdu` (see 6.7);

— the ADUs have been adapted to support automatic number plate recognition (ANPR)-based fee collection and enforcement;

— the structure of all major clauses has been harmonized to improve readability.

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.

The widespread use of road tolling requires provisions for users of vehicles that circulate through many different toll domains. Users should be offered a single contract for driving a vehicle through various toll domains. Where vehicles require on-board equipment (OBE) or where tolling is based on automatic number plate recognition (ANPR), these options should be interoperable with the toll systems in the various toll domains. In Europe, this need has been officially recognized and legislation on interoperability has already been adopted (see Directive 2019/520,[7] related Commission delegated regulation 2020/2003[9] and Commission implementing regulation 2020/204[8]). There is both a commercial and an economic justification regarding the OBE and the toll systems for International Standards supporting interoperability.

The system architecture specified in ISO 17573-1 is the basis for all ISO and CEN Standards in the road tolling domain. This document:

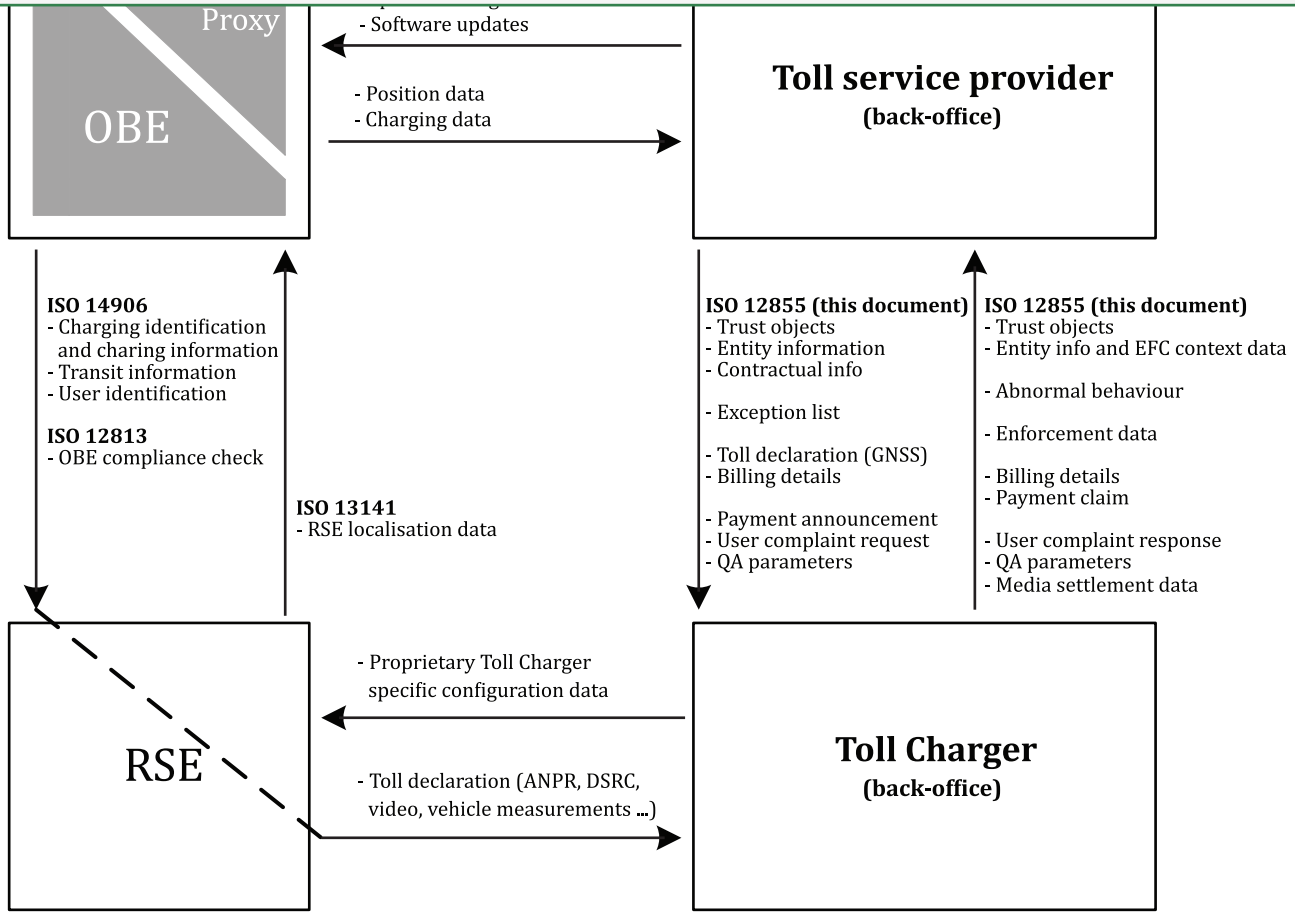
— adopts the concepts and basic system functionalities and structure of ISO 17573-1;

— uses the terminology of ISO 17573-1; and

— specifies the interfaces identified in ISO 17573-1.

ISO 17573-1 uses ISO/IEC 10746-3 for the description of the architecture.

Figure 1 shows the scope of the group of International Standards related to electronic fee collection (EFC) based upon the ISO 17573-1 system architecture.



Key

ANPR automatic number plate recognition
DSRC dedicated short-range communication
GNSS global navigation satellite system
QA quality assurance
OBE on-board equipment
RSE roadside equipment

Figure 1 — Scope of EFC-related International Standards

A given transport service for a given vehicle is fully identified by one or several toll declarations made available to the toll charger (TC). It is necessary to make toll declarations available according to the rules of the toll regime of the toll domain. These toll declarations can either be acquired on the road-side equipment (RSE) of the TC or acquired by an autonomous OBE and sent to the TC by the toll service provider (TSP).

The amount due for a given transport service used by a vehicle liable to toll is finalized by the TC with the use of the acquired or received toll declarations (as described above) and calculations are made according to the rules of the toll regime (formula, tariff tables, specific situations rules, traffic conditions, etc.). This means that the TC has the authority to decide on the amount due, even if it decides to assign the task of calculating the amount due to the TSP.

The calculated amount due, associated with a given transport service, is referred to as "billing details". For a given transport service, the billing details refer to one or several toll declarations.

Depending on the toll regime, billing details are computed by means of the information collected either by the TC or the relevant TSP, or both. They are finalized by the TC – or by the TSP if the TC has assigned this task to the TSP – and sent to the counterpart.

TSP, referring to one or several billing details. These payment claims include an amount due, considering any specific commercial conditions applicable to a vehicle, a fleet of vehicles or a given TSP, if specified for the transport service.

This document specifies a set of interactions in support of technical interoperability between back-office systems of TCs and TSPs. The EFC service and the EFC system model on which this document is based are specified in ISO 17573-1.

This document does not provide a full solution for interoperability and it does not specify other parts of the EFC system, other services, other technologies and non-technical elements of interoperability. It is specified as a toolbox International Standard of an application protocol data unit (APDU), which can be used for the assigned purpose. This APDU may contain different ADUs, which bear the transferred data. The detailed definitions of mandatory and optional elements in a real implementation are specified elsewhere. It does not specify all communication sequences, communication stacks and timings.

The development of a common European Electronic Toll Service (EETS), as a part of the aforementioned European EFC Directive and related Regulation and Implementing acts, also calls for the definition of an interoperable EFC service. EN 16986 specifies interoperable application profiles (IAP), applicable based on this document. These profiles specify a specific coherent set of transactions, triggers, timings, conditions, data elements, transfer mechanisms and supporting functions for an interoperable exchange of data between the back-office system of TCs and TSPs. EN 16986 is consistent with and is intended to provide support for the technical specification of the EETS.

This document identifies and specifies the APDU and a set of ADUs exchanged between two actors in the roles of TSP and TC as specified in ISO 17573-1. To specify these interfaces, this document uses the enterprise description of the toll environment, and the interactions specified between the named classes of roles, as specified in ISO 17573-1. This supports a complete specification of the data that is transferred between those identified entities. In addition, a number of computational interfaces are identified and interactions in terms of sequences of APDUs are specified.