SLOVENSKI STANDARD
oSIST prEN 16986:2026

01-julij-2026

Elektronsko pobiranje pristojbin - Interoperabilni profili aplikacije za informativno izmenjavo med ponudnikom storitve in operaterjem cestninjenja

Electronic fee collection - Interoperable application profiles for information exchange between service provision and toll charging

Elektronische Gebührenerhebung - Interoperable Anwendungsprofile für den Informationsaustausch zwischen den Dienste-Versorgern und Mauterhebern

Perception de télépéage - Profils d'application d'interopérabilité pour échange d'informations entre la prestation de service et la perception du péage

Ta slovenski standard je istoveten z: **prEN 16986**

ICS:

35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

oSIST prEN 16986:2026 **en,fr,de**

EUROPEAN STANDARD

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ICS

Will supersede EN 16986:2024

English Version

Electronic fee collection - Interoperable application profiles for information exchange between service provision and toll charging

Perception de télépéage - Profils d'application d'interopérabilité pour échange d'informations entre la prestation de service et la perception du péage

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 278.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Ref. No. prEN 16986:2026 E

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European foreword

This document (prEN 16986:2026) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 16986:2024.

In comparison with EN 16986:2024, main changes are as follows:

— updated interoperability application profiles tailored according to electronic fee collection (EFC) charging policies and primary used technologies;

— updated data definitions to reflect changes made to the underlying base standard EN ISO 12855:2025;

— updated terms and definitions, including reference to EN ISO 17573-2 as the primary source;

— updated informative Annex E on the “Use of this document for the European electronic toll service” (EETS), to reflect the recast of the EETS legislation (i.e. Directive (EU) 2019/520[11] and the corresponding Commission Implementing Regulation[13]).

This document is intended to provide support for the technical specification of the recast of the EETS legislation as laid down in the European Directive (EU) 2019/520 and in its Commission Delegated Regulation (EU) 2020/203 and Commission Implementing Regulation (EU) 2020/204. See Annex E on the “Use of this document for the EETS legislation”.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

Introduction

The CEN ISO Standard on *Electronic fee collection - Information exchange between service provision and toll charging* (i.e. EN ISO 12855) is a so-called toolbox standard. That means that it provides a large number of options that can be used to support various needs of toll chargers (TCs) and toll service providers (TSPs). As such, it provides useful but not sufficient support to ensure technical interoperability.

The aim of this document is to produce a profile specification that provides technical interoperability to support the EFC information exchange between TSPs and TCs according to the following tolling policies:

— based on traversing sections of roads;

— based on travelling within areas of territory;

— based on traversing meshed networks of roads.

This document covers the definition of interoperable application profiles (IAP) applicable for the use of EN ISO 12855:2025. These profiles define a specific coherent set of transactions, triggers, conditions, data elements, transfer mechanisms and supporting functions for an interoperable exchange of data between the back-end systems of TCs and TSPs (in Europe).

This document defines profiles using the concept of “International Standardized Profiles (ISP)”, as defined in ISO/IEC TR 10000--1. The ISP concept is specifically suited for defining interoperability specifications where a set of base standards can be used in different ways. This is exactly the case for EN ISO 12855:2025, where the base standard allows for different choices that are not interoperable.

The principles of the ISP-concept as applied in this document can be summarized as follows:

— an ISP will make references only to base standards or other ISPs;

— the profile will restrict the choice of base standard options to the extent necessary to maximize the probability of interoperability (e.g. chosen classes, conforming subsets, options and parameter values of base standards);

— the profile will not specify any requirements that would contradict or cause non-conformance to the base standards;

— the profile may contain conformance requirements that are more specific and limited in scope than those of the base standards;

— conformance to a profile implies conformance to a set of base standards, whereas conformance to that set of base standards does not necessarily imply conformance to the profile.

This document is intended to be complemented by EN 17154 that will specify how to evaluate implementations of this document.

1 Scope

This document specifies interoperable application profiles for the information exchange between toll chargers (TCs) and toll service providers (TSPs), by selecting suitable options from the base standard EN ISO 12855:2025.

Figure 1 shows the scope of this document in the context of EFC standards.

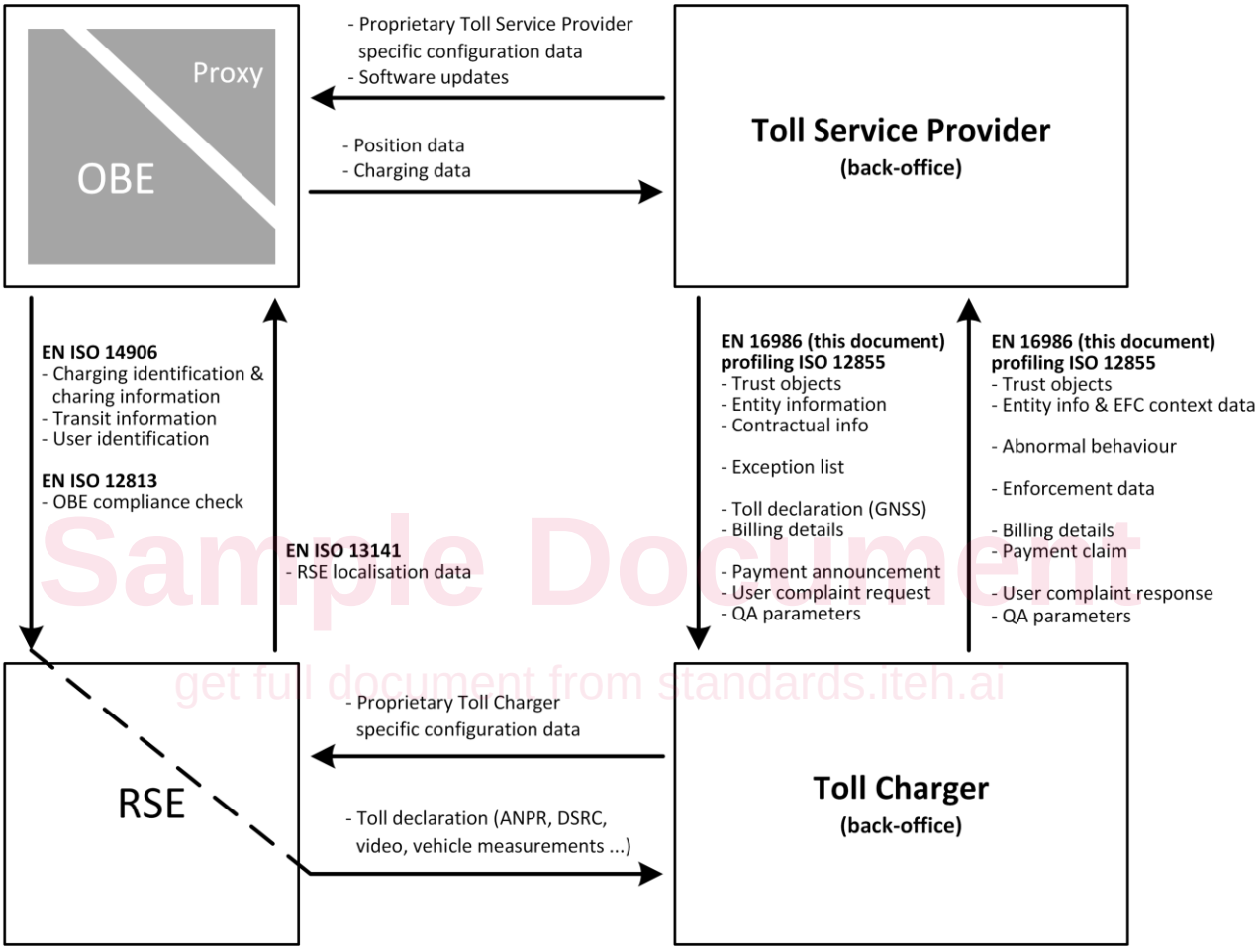

Figure 1 — Scope of EN 16986 in the context of EFC-standards

This document covers:

- exchange of information between back-end systems of TCs and TSPs, e.g.:
  - charging related data (toll declarations, billing details, payment claims, payment announcements);
  - administrative data (trust objects, EFC context data, contact details for enforcement, etc.);
  - user related data (exception lists, user details, abnormal behaviour information, CCC event data, user complaints);
  - confirmation data.
- transfer mechanisms and supporting functions;
- semantics of data elements;

- definitions (Annex A) of restrictions on data types w.r.t. the ASN.1 definitions in the base standard EN ISO 12855:2025 by introducing an XML Schema Definition (XSD) for each specified profile;
- implementation conformance statement (ICS) proforma (Annex B), as a basis for evaluation of implementation for conformity to this document;
- an interoperability statement proforma (Annex C), as a basis for assessment of transactional interoperability between the technical implementation of a TC and a TSP;
- a web service definition (Annex D) covering the use of simple object access protocol (SOAP) services as communication technology.

The implementation of the underlying back-end systems and their business processes is not covered. Therefore, the following aspects are outside the scope of this document:

- details about how back-end systems use the authenticator data elements of the base standard to implement security;
- how to use the data exchange to operate compliance checking and the enforcement process;
- commercial aspects;
- definition of non-functional features such as key performance indicators, acceptable fault levels, availability of interfaces of TC and TSP, and reporting requirements.

This document further explains the correspondence between the European electronic toll service (EETS) legislation and this document (Annex E).

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.

EN ISO 12855:2025, *Electronic fee collection — Information exchange between service provision and toll charging*

EN ISO 17573-2, *Electronic fee collection — System architecture for vehicle related tolling — Part 2: Vocabulary*

EN ISO 17573-3:2024, *Electronic fee collection — System architecture for vehicle related tolling — Part 3: Data dictionary*

EN ISO 14906:2023, *Electronic fee collection — Application interface definition for dedicated short-range communication*

EN ISO 12813:2024, *Electronic fee collection — Compliance check communication for autonomous systems*

EN ISO 13141:2024, *Electronic fee collection — Localization augmentation communication for autonomous systems*

IETF RC 959, *File Transfer Protocol [Oct 1985]*

IETF RFC 4217, *Securing FTP with TLS [Oct 2015]*

WSDL 1.1, *Web Services Description Language (WSDL) 1.1*[1]

1 http://www.w3.org/TR/2001/NOTE-wsdl-20010315 [15.03.2001]

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 17573-2 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

3.1
trigger
event that initiates a transaction

3.2
XML schema definition
based language that specifies a set of rules and structure for the creation of XML documents

[SOURCE: ISO/IEC/IEEE 26531:2023, 3.1.33]

4 Abbreviated terms

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

ADU	application data unit
ANPR	automatic number plate recognition
APCI	application protocol control information
APDU	application protocol data unit
CCC	compliance check communication
DSRC	dedicated short-range communication
EETS	European electronic toll service
EFC	electronic fee collection
FTP	file transfer protocol
GNSS	global navigation satellite system
IAP	interoperability application profile
ICS	implementation conformance statement
ISP	interoperability standardized profile
IUT	implementation under test
JSON	Javascript object notation
LPN	licence plate number
OBE	on-board equipment
RSE	roadside equipment
SOAP	simple object access protocol

SUT	system under test
TC	toll charger
TSN	transaction sequence number
TSP	toll service provider
VPN	virtual private network
XER	XML encoding rules
XML	extensible markup language
XSD	XML schema definition

5 Conformance

5.1 General

This clause describes the profiles that are specified by this document in clauses 8 to 11 and the respective conformance requirements for TCs and TSPs.

5.2 Base standard

This document relies on EN ISO 12855:2025 as its base standard.

5.3 Main contents of the IAPs in this document

5.3.1 General requirements

This document limits or restricts options and ranges of data types defined in the base standard. In some cases, it limits the range of allowed values of data types imported into the base standard from other standards. This document limits the optionality present in the base standard it is derived from, by selecting part of the functions, and mandatorily supporting or excluding several of the optional data elements specified in it. These limitations are specified in the clauses for the transaction types (clause 7), the specified profiles (clauses 8 to 11), and for the data elements (clause 12), that are formally defined in Annex A.

The following general requirements apply throughout this document:

1) The definitions (ASN.1) of some data types and data elements feature the extensibility code ("…" in ASN.1) for the purpose of supporting compatibility with future versions of this document;

2) All data exchanges in connection with ICC cards shall not be supported.

The syntax of an `InfoExchange` application protocol data unit (APDU) shall be in accordance with the definitions of the ASN.1 code in EN ISO 12855:2025 with the limitations and semantics relevant for the profile(s) to which conformance is claimed.

In particular, this document:

1. Rules the usage of series of same data items (SEQUENCE OF in the ASN.1 notation) by allowing sequences with zero items, or by imposing the presence of at least one item in the sequence;
2. Extends the ranges and related semantics of some numerical codes by using CEN/ISO reserved ranges in the base standard (see clause 6.2);
3. Adds optional data types or data elements not present the base standard (see clause 6.3).

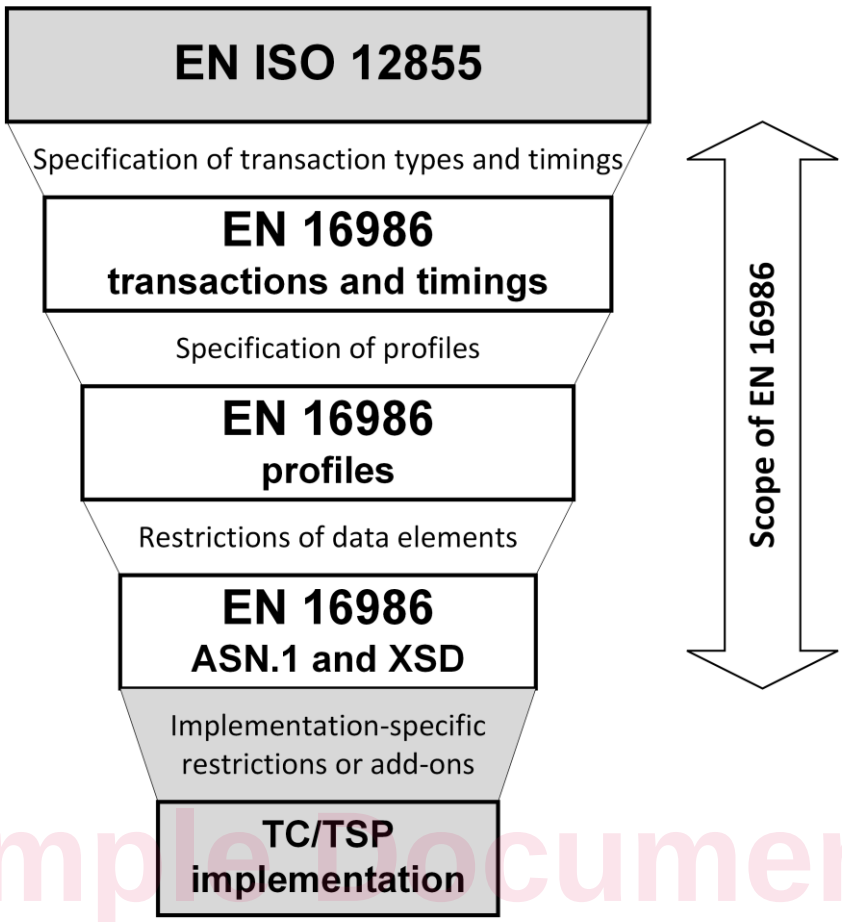

Figure 2 — Restrictions to the base standard

The specification of transaction types and timings is covered in clause 7. These transaction types and timings are valid for all profiles.

The profiles are specified in clauses 8 to 11 included.

The restrictions of the data elements are specified in clause 12.

Any further implementation-specific restrictions or add-ons, which are outside the scope of this document, may further restrict or extend the remaining optional data elements or values in a profile in individual implementations. These restrictions are typically specified in top-up specifications or implementation specifications.

Any implementation that claims conformance to this document shall implement one or more of the specified profiles in this document.

5.3.2 Profiles

The variety of possible tolling policies in the various tolling domains requires the following different classes of profiles:

1. Sections: profiles for information exchange for tolling policies based on travelling on sections of roads.

2. Area Staying: profiles for information exchange for tolling policies based on staying time within an area.

3. Area Travel: profiles for information exchange for tolling policies based on distances travelled within an area.

4. Cordon: profiles for information exchange for tolling policies based on crossing borders between territories (cordon-crossing).

5. Meshed: profiles for information exchange for tolling policies based on travelling in meshed networks of roads.

Within a profile class, a further distinction is made in terms of the tolling technology that is used in a toll domain. The following technologies are recognized by this document:

1. **DSRC**. Vehicles are detected and identified by means of a DSRC interaction between the vehicle's OBE and the TC's DSRC RSE when passing a given location where the RSE is positioned.
2. **Autonomous**. Vehicles are capable of autonomously track their positions and of communicating that information together with their identification to TSPs back-ends.
3. **Automatic number plate recognition (ANPR)**. The detection and identification of vehicles is determined by reading their licence plate at a given location where TC's number plate recognition equipment is positioned.

In addition to that, a further distinction may be made according to the responsibilities fulfilled by the TC and TSP roles, particularly about who is dominant, that is, who has the role of detecting the use of a charge object. This role is identified in the function of calculating the fee for the usage of a tolled road. Two cases are identified:

1) TC dominant: The TC calculates the fee due for the use of a tolled network element;

2) TSP dominant: The TSP calculates the fee due for the use of a tolled network element.

The resulting 30 theoretical combinations of tolling policies, tolling equipment and dominant responsibility are not all implemented in real systems, nor are they all realistic ones.

Table 1 shows practical combinations of tolling policies, tolling equipment and dominant responsibilities that may be considered for this document. For each feasible combination, a short description of the tolling policy is given. Empty cells indicate non-feasible combinations.

Table 1 — Tolling policies vs. tolling technologies

	Technology	
Tolling policy / Dominance	**Discrete (DSRC or ANPR)**	**Autonomous**
Sections/TC	Tolling by means of DSRC or ANPR to detect the use of sections of roads, with the TC playing the dominant role.	Tolling by means of autonomous positioning recognition to detect the use of sections of roads, with the TC playing the dominant role.
Sections/TSP		Tolling by autonomous positioning recognition to detect the use of sections of roads, with the TSP playing the dominant role.
Area Staying/TC	Tolling by means of DSRC or ANPR to detect the time of staying in identified areas, with the TC playing the dominant role.	Tolling by means of autonomous positioning recognition to detect the time of staying in identified areas, with the TC playing the dominant role.
Area Staying/TSP		Tolling by means of autonomous positioning recognition to detect the time of staying in identified areas, with the TSP playing the dominant role.

	Technology	
Tolling policy / Dominance	**Discrete (DSRC or ANPR)**	**Autonomous**
Area Travel/TC	Tolling by means of DSRC or ANPR to detect the travelling of a distance in identified areas, with the TC playing the dominant role.	Tolling by means of autonomous positioning recognition to detect the travelling of a distance in identified areas, with the TC playing the dominant role.
Area Travel/TSP		Tolling by means of autonomous positioning recognition to detect the travelling of a distance in identified areas, with the TSP playing the dominant role.
Cordon/TC	Tolling by means of DSRC or ANPR to detect the crossing of borders of identified cordons (areas), with the TC playing the dominant role.	Tolling by means of autonomous positioning recognition to detect the crossing of borders of identified cordons (areas), with the TC playing the dominant role.
Cordon/TSP		Tolling by means of autonomous positioning recognition to detect the crossing of borders of identified cordons (areas), with the TSP playing the dominant role.
Meshed/TC	Tolling by means of DSRC or ANPR to detect the use of road segments in a meshed network of roads, with the TC playing the dominant role.	Tolling by means of autonomous positioning recognition to detect the use of road segments in a meshed network of roads, with the TC playing the dominant role.
Meshed/TSP		Tolling by means of autonomous positioning recognition to detect the use of road segments in a meshed network of roads, with the TSP playing the dominant role.

The supported combinations in Table 1 give rise to the specification of profiles, where specific provisions of the base standard EN ISO 12855:2025 are chosen to support one combination of tolling policy and used tolling technology. Some combinations are not considered in this edition because of lack of specific requirements for them. Consequently, while leaving the specification of further profiles to subsequent editions of this document, only the profiles listed in Table 2 are herein specified. For each specified profile, a reference to tolling policy, to the primary tolling technology, and to the dominance is given, together with an indication of the clause where the profile is fully specified.

Table 2 — Profiles

Profile name	Tolling policy/dominance	Tolling technology	Clause
SectionDiscrete	Sections/TC	ANPR or DSRC	8
SectionAutonomous	Sections/TC or Sections/TSP	Autonomous	9
MeshedDiscrete	Meshed/TC	ANPR or DSRC	10
AreaDistanceAutonomous	Area Travel/TC	Autonomous	11

TCs shall select one of the above profiles for their toll domain.

TSPs shall support all profiles that are selected by the TCs with whom the TSP has a contract.