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Elektronsko pobiranje pristojbin - Analiza vrzeli EETS in predlagan akcijski načrt za standardizacijo

Electronic fee collection - EETS gap analysis and proposed standards roadmap

Elektronische Gebührenerhebung - EETS Lückenanalyse und vorgeschlagener Handlungsplan für die Normierung

Perception de télépéage - Analyse des lacunes du SET et feuille de route des normes proposées

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Electronic fee collection - EETS gap analysis and proposed standards roadmap

Perception de télépéage - Analyse des lacunes du SET
et feuille de route des normes proposées

Elektronische Gebührenerhebung - EETS
Lückeanalyse und vorgeschlagener Handlungsplan
für die Normierung

This Technical Report was approved by CEN on 4 October 2020. It has been drawn up by the Technical Committee CEN/TC 278.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (CEN/TR 17546:2020) has been prepared by Technical Committee CEN/TC 278 “Intelligent Transport Systems”, the secretariat of which is held by NEN.

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Introduction

Historical background

From 2004 to 2019, two main European legislative acts were ruling the regulated interoperable tolling service in Europe, the so-called European Electronic Tolling Service (EETS):

1. the Directive 2004/52/EC of the European Parliament and European Council of the 29th of April, 2004, concerning the interoperability of tolling systems within the Community ^[28];
2. the Decision of the European Commission of the 6th of October 2009 regarding the definition of the European tolling service and its technical aspects (2009/750/EC) ^[29].

The main objective of the above acts was to set up the conditions to ensure compatibility and interoperability of the different electronic tolling systems in the European Union (EU). The acts apply to road tolling, as well as tunnels, bridges and ferries.

Key aspects of the legislation were:

1. creation of a European Electronic Tolling Service (EETS);
2. obligation for all new tolling systems (installed after the 1st of January 2007) to support the technologies listed in the legislation, i.e. 5,8 GHz dedicated short-range communication (DSRC), global navigation satellite system (GNSS, including GPS and GALILEO) and Global System for Mobile communications-General Packet Radio Service (GSM-GPRS); systems may be DSRC-based or GNSS-based (autonomous tolling systems) schemes;
3. obligation for all toll service providers to provide their users with the possibility to obtain on-board devices that support **all** technologies above;
4. possibility for users to have a single contract with a service provider that gives access to all electronic tolling systems in Europe;
5. obligation for all toll chargers to give not-discriminatory access to their tolling domains for all European toll service providers.

Tuning the EETS service definition: the new legislation

After the introduction of the European legislation, the development of the EETS went on slower than expected, due to commercial, procedural and legislative aspects that were not initially considered.

Some pilots and European projects (among all the REETS – Regional EETS ^[44]) had shown that a number of standards ought to be added to and become part of the European EETS legislation, in order to achieve a more solid interoperable framework.

While, with lengthy procedures, a core of EETS was beginning to take shape, with Service Providers being accredited in a number of Toll Domains and registered in their respective member state of the EU, the European Commission decided that it was time to revise (recast in EU legal parlance) the Directive. The revision process, a rather lengthy process, eventually led to a recast Directive (EU) 2019/520 of the 19th of March 2019^[30]. The new Directive gives more flexibility in the on-board equipment (OBE) (possibility for light weight vehicles to mount a DSRC-only device, possibility of a “scattered” device that possibly uses already existing components in the vehicle, ...), more flexibility for accreditation and registration as European Toll Service Provider, provides for cross-border enforcement, and empowers the EU Commission with the ability of adopting Delegated and Implementing Acts to refine the technical contents of the “new” EETS.

New main characteristics of the new EETS legislation are:

- addition of cross-border enforcement;
- separation of Light Weight Vehicles and Heavy Weight Vehicles;
- clarification of responsibilities of the EETS providers;
- clarification of responsibilities of the Toll Chargers;
- removal of market entry barriers in order to promote competition;
- addition of automatic number plate recognition (ANPR) technologies.

The Commission adopted two Acts, one named Commission Implementing Regulation ^[31], the second one named Commission Delegated Regulation ^[32], that were adopted at the end of 2019, to further define the technical and procedural characteristics of the EETS. These Acts, among others, name and prescribe a number of CEN standards to be used for the EETS.

This document examines the requirements expressed in the new European legislation for EETS (including mandated CEN/ISO standards) and maps these requirements to the current CEN EFC standards, with the aim to identify gaps in the standardized offer (standards to be developed/enhanced) and also perceived inconsistencies and weaknesses in the current version of the European legislation. A roadmap is then proposed to fill the discovered gaps, whilst noting that it is not CEN's role to develop a turnkey solution for the EETS.

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1 Scope

This document provides an EETS gap analysis with the aim to identify the need for new or updated standards to provide an enhanced support of the recast of the EU EETS legislation ^{[29], [31], [32]}.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

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

3.1

back end

part of a back-office system interfacing to one or more *front ends* (3.9)

[SOURCE: ISO/TS 17573-2:2020, 3.22]

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3.2

certification

act of providing an official document, as proof that something has happened or been done

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3.3

toll service provider

legal entity providing toll services on one or more *EETS domains* (3.8)

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[SOURCE: ISO/TS 17573-2:2020, 3.206]

3.4

toll charger

entity which levies toll for the use of vehicles in a toll domain

[SOURCE: ISO/TS 17573-2:2020, 3.194]

3.5

European Electronic Toll Service**EETS**

toll service provided under a contract on one or more *EETS domains* (3.8) by an *EETS provider* (3.6) to an *EETS user* (3.7)

3.6

EETS provider

entity which, under a separate contract, grants access to the *EETS* (3.5) to an *EETS user* (3.7), transfers the tolls to the relevant toll charger, and which is registered by its Member State of establishment

3.7**EETS user**

natural or legal person who has a contract with an *EETS provider* (3.6) in order to have access to the *EETS* (3.5)

3.8**EETS domain**

road, road network, structure, such as a bridge or a tunnel, or ferry, where tolls are collected using an electronic road toll system

3.9**front end**

part of a tolling system consisting of *on-board* equipment (OBE) (3.10) and possibly a proxy where road tolling information and usage data are collected and processed for delivery to the back end

[SOURCE: ISO/TS 17573-2:2020, 3.85]

3.10**on-board equipment****OBE**

all required equipment on-board a vehicle for performing required electronic fee collection (EFC) functions and communication services

[SOURCE: ISO/TS 17573-2:2020, 3.126]

3.11**notified body**

organisation that has been designated by a member state to assess the conformity of certain products, before being placed on the E.U. market

4 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ADU	Application data unit (EN ISO 14906)
ANPR	Automatic Number Plate Recognition
ASN.1	Abstract syntax notation one (ISO/IEC 8824-1)
CCC	Compliance check communication
DSRC	Dedicated short-range communication (EN ISO 14906)
EETS	European Electronic Tolling Service
EFC	Electronic fee collection (EN ISO 14906)
GNSS	Global Navigation Satellite System
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
HMI	Human Machine Interface
LAC	Localization augmentation communication
OBE	On-board equipment (EN ISO 14906)

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OJEU	Official Journal of the European Union
PICS	Protocol implementation conformance statement
REETS	Regional EETS
RSE	Roadside equipment (EN ISO 14906)
TC	Toll Charger
TSP	Toll Service Provider

5 EETS legislation and relevant standards**5.1 Introduction**

This clause is to list the standards **currently** referenced in the EETS legislation. Standards are divided into requirement and test standards. The information contained in this clause forms the basis for the gap analysis in Clause 6.

The EETS legislation lists requirements for all actors in the European Tolling Service, including the Toll Chargers, the Toll Service Providers, and the certification entities (e.g. Notified Bodies). In the requirement statements, a number of International standards are cited. The following clauses list the standards exactly as they are referred to in the EETS legislation, independent of their latest status and versions. This type of information is then needed in Clause 6 for the gap analysis. It is noteworthy that not all EETS required functionalities are covered by international standards, nor all existing standards covering EETS functionalities are quoted in the EETS legislation. This will be dealt with in Clause 6, as part of the Gap analysis.

Conformance testing is dealt with in the Annex III of the Implementing Act, which states that conformity assessment can be done by either one of the following two procedures as defined by Decision No 768/2008/EC [45]:

- a) internal production control (module A);
- b) EU type examination (Module B), followed by conformity to type based on internal production control.

Test standards for all requirement standards are cited in the EU legislation and may be used to evaluate conformity. Its usage, however, is not mandatory.

5.2 Standards supporting the EETS definition**5.2.1 Generalities**

The EETS is defined by requirements (technical specifications) and tests (certification specifications) functionalities.

As far as technical specifications are involved, the EETS foresees three types of electronic tolling, namely based on dedicated short-range communication (DSRC), autonomous, and automatic number plate recognition (ANPR) technologies.

Standards applying to both requirements and tests functionalities, and mentioned in the legislation, are listed in the following clauses.

5.2.2 Requirement standards

For DSRC-based tolling systems tolling transactions, the EETS considers two alternative requirement standards, as shown in Figure 1:

- EN 15509:2014, that can be used in all EETS systems in Europe;
- ETSI ES 200 674-1 V2.4.1, that may alternatively be used in Italy.

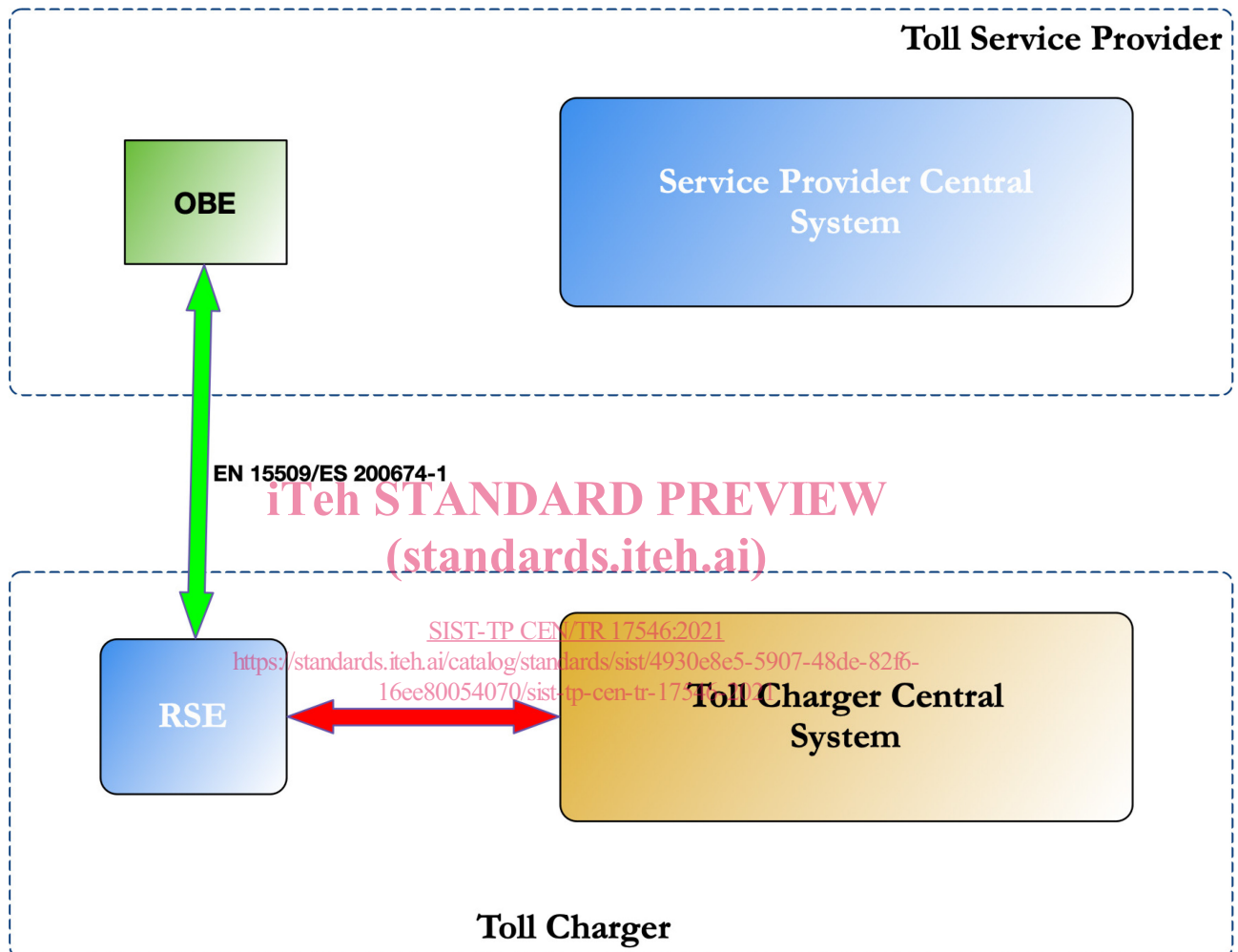


Figure 1 — Standards supporting tolling transactions in DSRC systems

For checking conformity of OBUs and enhancing location coordinates in autonomous tolling domains, the EETS considers two requirement standards, as shown in Figure 2:

- EN ISO 12813:2015 to check conformity and functioning of OBE devices respectively EN ISO 12813:2019 to retrieve vehicle classification parameters from OBE devices
- EN ISO 13141:2014 to enhance location information

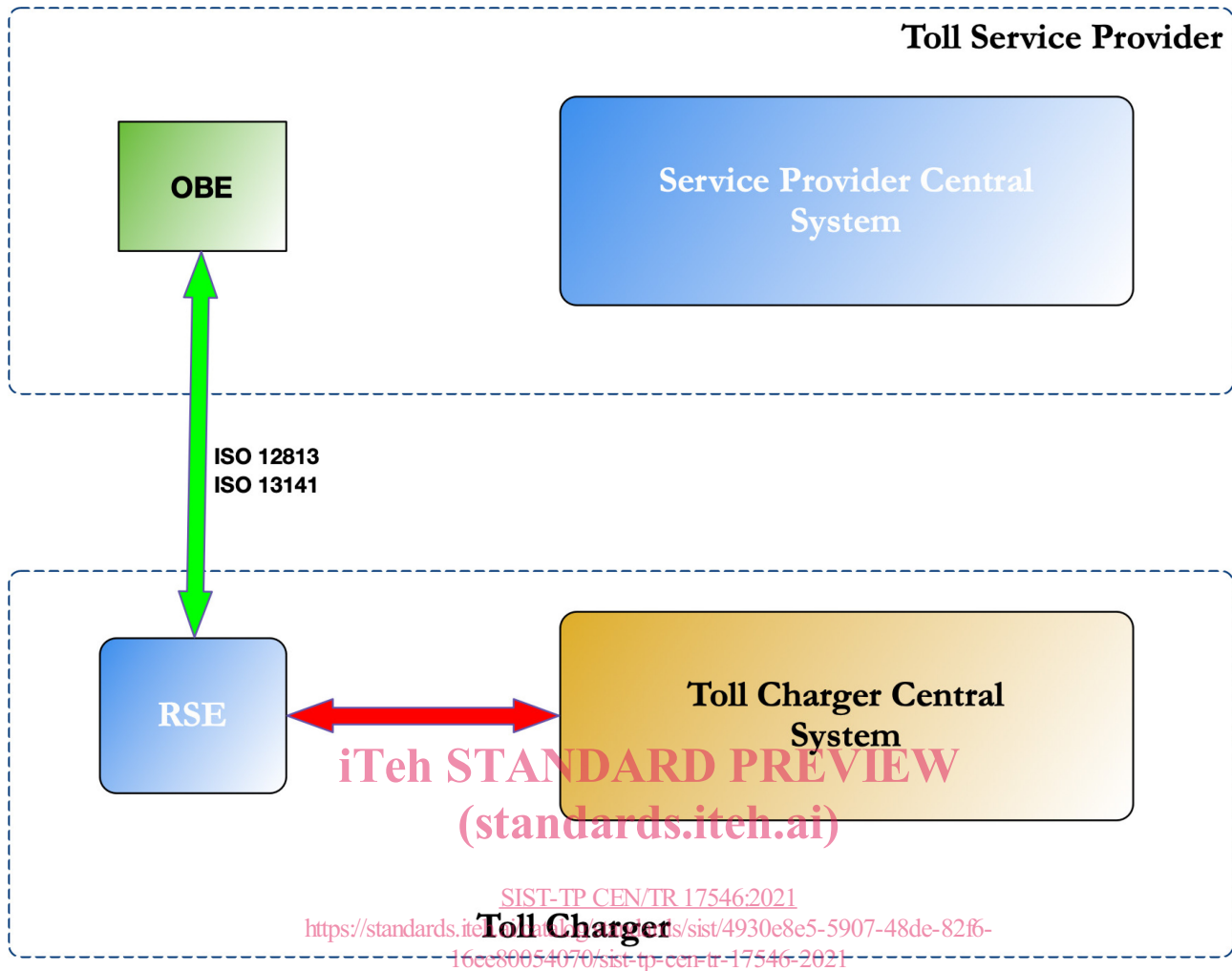


Figure 2 — Standards supporting CCC and LAC DSRC interactions in autonomous tolling systems

For all types of tolling systems, the EETS considers the standard CEN/TS 16986:2016 and CEN/TS 16986:2016/AC:2017 to exchange tolling related information between toll chargers and toll service providers, as shown in Figure 3.