



BSI Standards Publication

**Electronic fee collection — Requirements for
EFC application interfaces on common media**

National foreword

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**Electronic fee collection —
Requirements for EFC application
interfaces on common media**

*Perception du télépéage — Exigences relatives aux interfaces
d'application de télépéage sur médium commun*



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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

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

Transportation network improvement, including road and railway, is essential to drive economic growth. Integrated transport service has been aimed at topics such as user convenience, transport safety, reliability, efficiency and availability. For example, a traffic manager can find which kinds of improvements are needed to relieve traffic bottlenecks by analysing user transport flows in a transport system considered as a whole.

It is usually necessary to use different transport services to transfer people or goods from origin to destination. Sometimes, using different transport services in the same trip becomes cumbersome when transport services are operated by different operators, e.g. bad interconnections between different transport modes due to user needs to search and compare transportation modes, needing separate charging or payment for the transport services used. The connections between different transport modes and the means to achieve seamless travel are improving with the use of information and communication technologies (ICT).

ISO/TR 19639 investigated case studies on the use of a common payment medium when combining public transport services and road services, based on the use of a common payment schema. This common payment schema is further categorised into integrated central accounts and integrated on-board accounts.

ISO/TR 19639 concluded by stating the need for new electronic fare collection (EFC) standards to support on-board integrated accounts, among which is an application interface between the common payment medium and the common service rights provider (CSRP). The background of on-board accounts in EFC are:

- Operational methods of EFC systems might be different due to regional and local circumstances. EFC systems can be classified into central accounts and on-board accounts, using a common payment medium, which are widely adopted in Asian countries.
- On-board account payment media are commonly used for public transport in several countries, e.g. Singapore, Malaysia and China.
- Central payment accounts are considered one of the common service rights methods explained in ISO/TR 20526, whereas the EFC standards are currently predominantly based on a central account.
- A convergence on the usage of on-board account for both EFC systems and public transport should be considered.

This document describes an EFC application as one type of transport service specific application and the application interface requirements for a common service rights application. A common service rights application is explained in informative [Annex C](#) of this document for understanding a common payment scheme based on this concept as shown in [Figure 1](#).

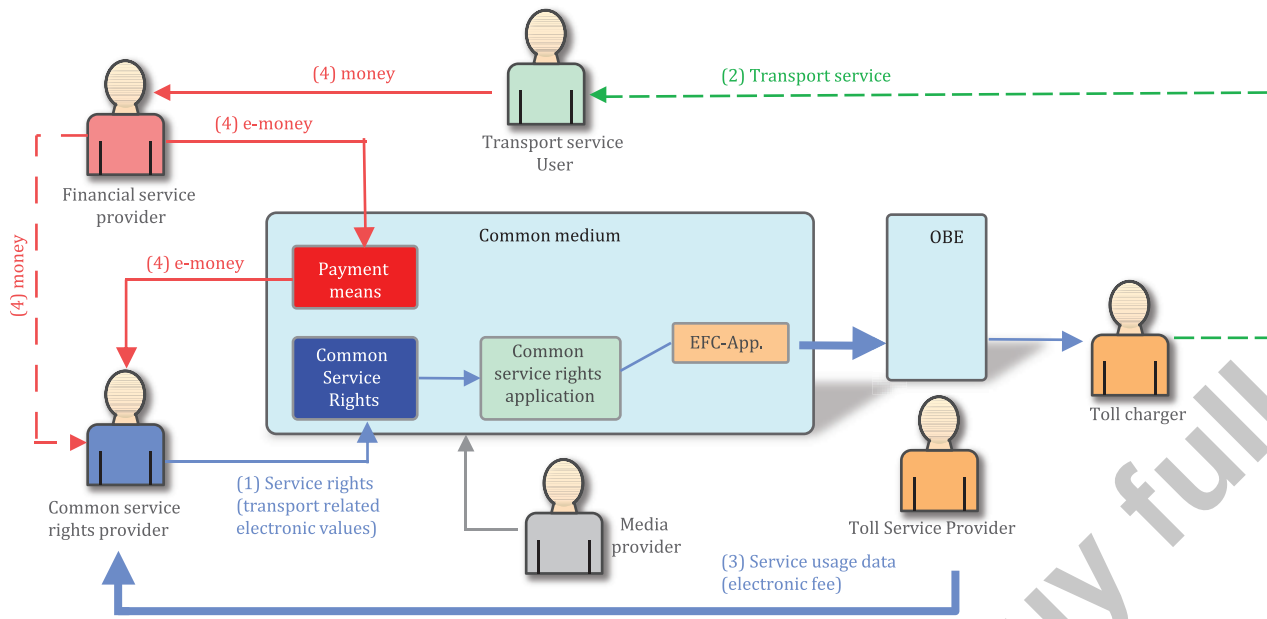


Figure 1 — Common payment medium concept for EFC scheme

Arrow lines (4) labelled 'money' and 'e-money' are monetary flows and out of scope of this document.

Arrow line (2) labelled 'Transport service' is not an ICT interface but a physical transport service.

Other arrow lines are in the scope of ISO/TC 204 (EFC and public transport standards) and the thick arrow line between common payment medium and OBE is within the scope of this document.

This document will extend the set of EFC standards to allow provisions for multi-modal transport services by using a common payment medium.

This document defines among others, the role and responsibilities of a CSRP. The CSRP provides a common payment medium for enabling use of EFC, a public transport service and retail shopping service to service users with one account. CSRP may provide the usage record of user's multi modal transport trip as a form of customer service.

This document contains a number of annexes. Data type specifications are given in [Annex A](#), an implementation conformance statement (ICS) proforma is given in [Annex B](#). The common payment medium concept for any transport service is presented in [Annex C](#). General kinds of application structure in a medium are presented in [Annex D](#). General requirements from medium relating standards is presented in [Annex E](#). A typical system migration method and technical solution supporting medium upgrading are presented in [Annex F](#). Examples of reloading types and transactions are presented in [Annex G](#). The EFC security requirements for a common payment medium are presented in [Annex H](#) based on EFC functional requirements.

The scope of this document includes an EFC application interface for a common payment medium as shown in [Figure 1](#), as well as the role and responsibilities of a Common Service Rights Provider (CSRP).

NOTE [Figure 2](#) explains the relation of CSRP among related sectors including EFC. E-money is exchanged between the Transport Service Provider (TSP) in the EFC sector and the CSRP. E-money is exchanged between retail in the commerce sector and the CSRP.

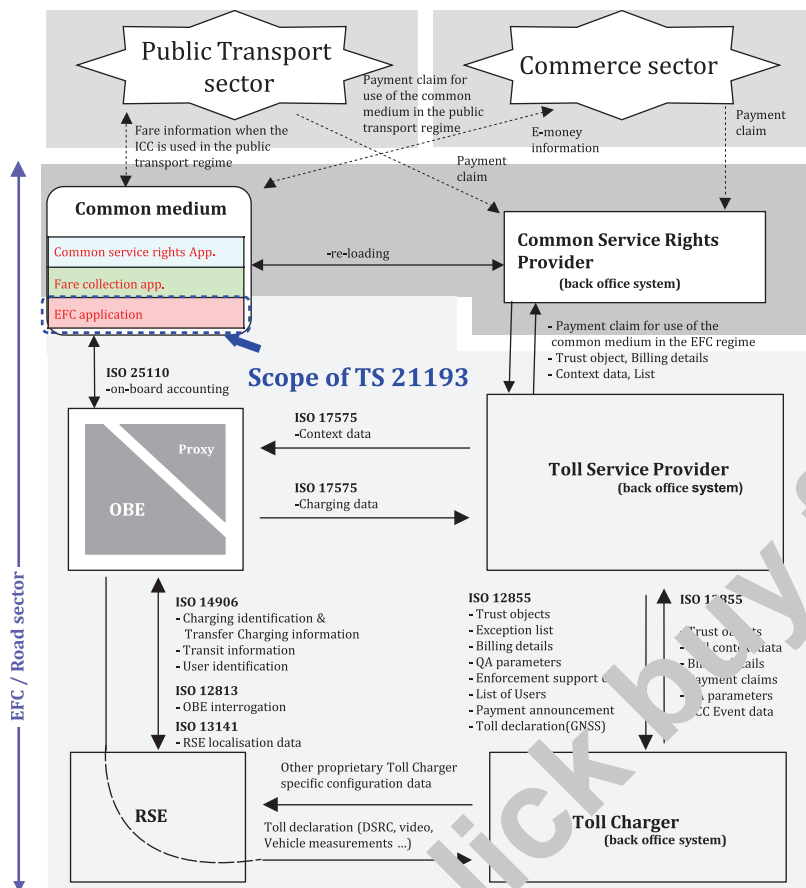


Figure 2 — Scope within the EFC computational architecture

Electronic fee collection — Requirements for EFC application interfaces on common media

1 Scope

This document defines requirements to support information exchanges among related entities of a common payment scheme. It defines:

- a) electronic fee collection (EFC) functional requirements for a common payment medium;
- b) an application structure in a common payment medium;
- c) EFC application data in a common payment medium.

The following are outside the scope of this document:

- requirements and data definitions for any other transport services such as public transport;
- a complete risk assessment for an EFC system using a common payment medium;
- security issues arising from an EFC application among all transport services;
- the technical trust relationship between a CSRP and a service user;
- concrete implementation specifications for implementation of security for an EFC system;
- detailed specifications required for privacy-friendly EFC implementations;
- any financial transactions of the CSRP.

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 14906:2018, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO 17573-1:2019, *Electronic fee collection — System architecture for vehicle-related tolling — Part 1: Reference model*

3 Terms and definitions

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

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

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

3.1

central account

payment means (3.11) or common service rights in an electronic fee collection (EFC) system, stored in a central system