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BSI Standards Publication

# Intelligent transport systems — Framework for cooperative telematics applications for regulated vehicles (TARV)

Part 26: Electric vehicle dynamic charging monitoring

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# National foreword

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# Intelligent transport systems — Framework for cooperative telematics applications for regulated vehicles (TARV) —

## Part 26: Electric vehicle dynamic charging monitoring

*Systèmes intelligents de transport — Cadre pour applications télématiques collaboratives pour véhicules réglementés (TARV) —*

*Partie 26: Surveillance de la charge dynamique des véhicules électriques*

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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 document 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).

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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*.

A list of all parts in the ISO 15638 series can be found on the ISO website.

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.

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# Introduction

Given the increasing needs related to battery-powered heavy vehicle dynamic charging system developments, the monitoring of powered heavy electric vehicle charging status while on the road should be made available to charging network service providers by using the framework of the ISO 15638 series (TARV) to realize efficient charging services from the fleet energy management viewpoint.

Battery powered heavy electric vehicles generate and feed back power to the charging network when decreasing in speed by using a regeneration braking system (when the battery is fully charged, this energy is transferred to the grid). Such information also needs to be fed back to the charging network service provider for monitoring status for the purpose of fleet energy management.

This document standardizes the conceptual operational framework of the information-collecting service provided by service providers. The ISO 15638 series of TARV application standards are based on a triumvirate of vehicle operators with in-vehicle systems, on-board application service providers and road authority. A new means of energy consumption management and enforcement can be enabled by using this document where authorities require such regulated monitoring for decarbonizing purposes in the transport sector.

Telematic applications need to be able to be integrated into the embedded computing systems available on the market. The need for interoperability of different solutions is also important as several actors with different solutions can be involved in information needs. Securing the data exchanged is also a particularly important point.

This document is intended for unregulated services, but if needed, road authorities or other users can also use this document for the deployment of regulated services.

This document is intended for public road transport, but if needed, private road/property application can be made possible by using this document.

NOTE Regarding European Commission (EC) regulations, ISO 15638-9 already covers provisions consistent with EC 165/2014. This document is complementary to ISO 15638-9, and is therefore consistent with EC 165/2014.

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# Intelligent transport systems — Framework for cooperative telematics applications for regulated vehicles (TARV) —

# Part 26: Electric vehicle dynamic charging monitoring

## 1 Scope

This document provides a freight vehicle dynamic charging information collecting service function or application for non-enforcement applications and for regulated application services (RAS). It is intended for the road transport decarbonizing management purposes of regulated commercial freight vehicle movements using battery-powered heavy electric vehicles. This document also specifies the framework for remote energy consumption information collecting for non-enforcement and the conceptual operation of other management purpose applications.

This document is intended to reinforce vehicle energy efficiency for non-enforcement and other purposes by collecting dynamic charging information of battery powered heavy electric vehicles. Collected information can be used for fee collection and energy management purposes, which are outside the scope of this document.

This document is applicable to dynamic charging applications. It is not applicable to information exchange purposes such as charging right and payment authorization.

Static charging information exchange application is standardized by other ISO Technical Committees, such as ISO TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*. It is not applicable to this document.

## 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 14816:2005, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 15638-3, *Intelligent transport systems — Framework for collaborative telematics applications for regulated commercial freight vehicles (TARV) — Part 3: Operating requirements, 'Approval Authority' procedures, and enforcement provisions for the providers of regulated services*

ISO/TS 15638-4, *Intelligent transport systems — Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) — Part 4: System security requirements*

ISO 15638-5, *Intelligent transport systems — Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 5: Generic vehicle information*

ISO 15638-7:2013, *Intelligent transport systems — Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 7: Other applications*

ISO 15638-21, *Intelligent transport systems — Framework for cooperative telematics applications for regulated commercial freight vehicles (TARV) — Part 21: Monitoring of regulated vehicles using roadside sensors and data collected from the vehicle for enforcement and other purposes*

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## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15638-21 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/

## 4 Symbols and abbreviated terms

| | |
|---|---|
| ASD file | application service data file |
| ASP | application service provider |
| CALM | communications access for land mobiles |
| C-ITS | cooperative intelligent transport system |
| CONOPS | concept of operations |
| DRD | driver recording device |
| GNSS | global navigation satellite system |
| HMC | host management centre |
| ID | Identity |
| ITS | intelligent transport system |
| ITS-S | ITS station |
| IVS | in-vehicle system |
| LDM | local dynamic map |
| LDT | local data tree |
| QoS | quality of service |
| RAS | regulated application service |
| RFID | radio frequency identification |
| ROAM | regime for open application management |
| TARV | telematics applications for regulated vehicles |

## 5 General overview and framework

The ISO 15638 series addresses and defines the framework for a range of cooperative telematics applications for regulated vehicles (such as electronic tachograph monitoring, driver work records, emergency messaging/eCall, mass monitoring, 'Mass' information for jurisdictional control and enforcement, speed monitoring, access control, access methods, location monitoring, weigh in motion, freight vehicle stability monitoring, tyre monitoring, overhead clearance etc.). The overall scope includes the concept of operation, legal and regulatory issues, and the generic cooperative ITS service platform. The framework is based on a (multiple) service provider-oriented approach, including provisions for the certification and auditing of service providers.

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This document utilizes the framework and architecture for freight vehicle stability monitoring defined in 15638-21. The general conceptual operation description of the roles of the actors in "extended" TARV architecture is also defined in ISO 15638-21.

NOTE The framework defined before the publication of ISO 15638-21 did not include “roadside sensors/VMS/info”. The framework is “extended” by ISO 15638-21 to include them.

As a summary, Figure 1 shows the "extended" role model conceptual architecture showing the key actors and their relationships as defined in ISO 15638-21.

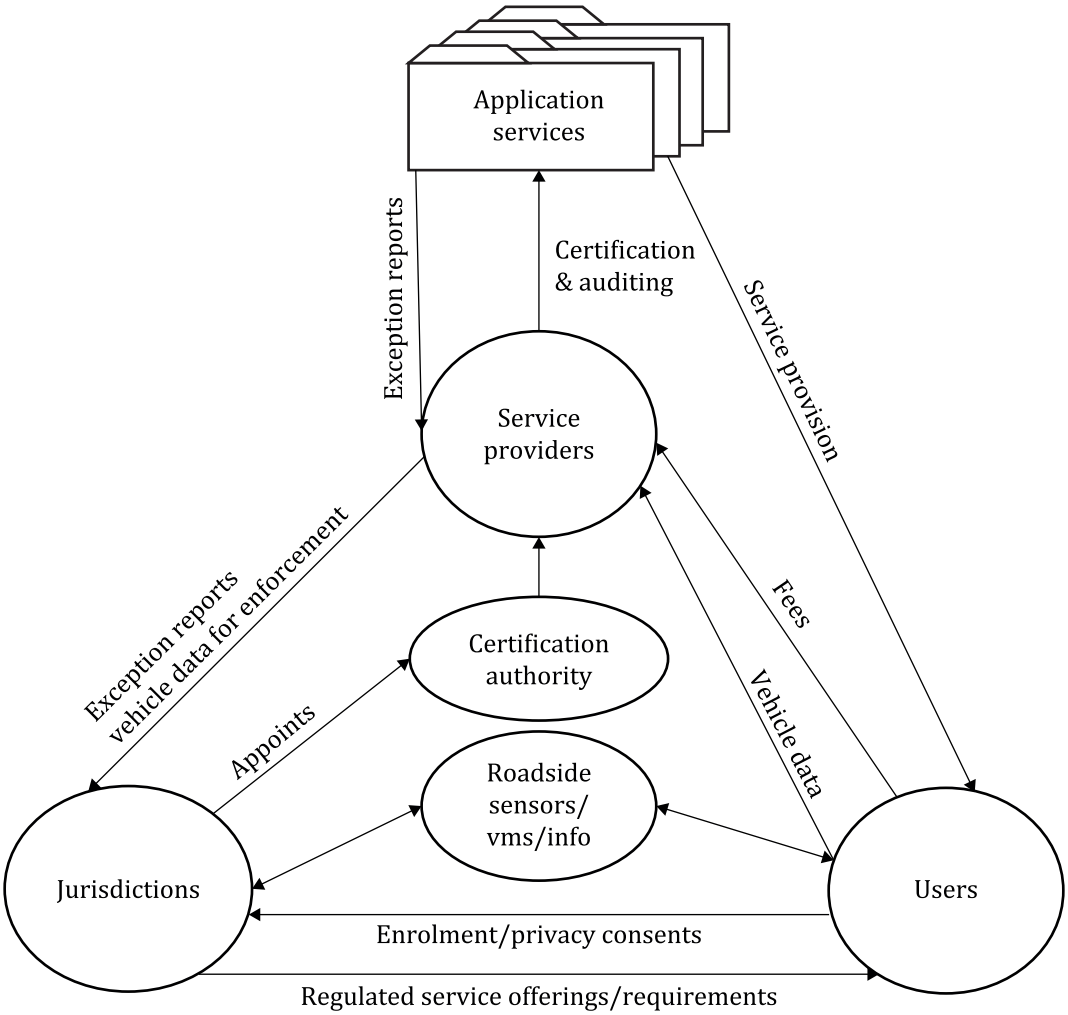


**Figure 1 — Extended role model conceptual architecture**

This document is intended for an unregulated service provision application for efficient road transport by freight vehicles, achieved through the collection, from the vehicle, of battery-powered electric vehicle energy consumption information. This can include data collection on the dynamic charging and feed back of energy to/from grid provision, for example. Figure 2 shows the architecture from the viewpoint of the provision of an unregulated (commercial) application service, using the common "extended" TARV platform defined in ISO 15638-21.

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