BS ISO 15638-12:2014

BSI Standards Publication

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

Part 12: Vehicle mass monitoring

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National foreword

This British Standard is the UK implementation of ISO 15638-12:2014. It supersedes PD ISO/TS 15638-12:2013 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

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INTERNATIONAL STANDARD

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

Part 12: Vehicle mass monitoring

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

Partie 12: Monitorage de la masse des véhicules

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This first edition cancels and replaces ISO/TS 15638-12:2013.

ISO 15638 consists of the following parts, under the general title *Intelligent transport systems — Framework for cooperative telematics applications for regulated vehicles (TARV)*:

— *Part 1: Framework and architecture*

— *Part 2: Common platform parameters using CALM*

— *Part 3: Operating requirements, "Approval Authority" approval procedures, and enforcement provisions for the providers of regulated services*

— *Part 5: Generic vehicle information*

— *Part 6: Regulated applications*

— *Part 7: Other applications*

— *Part 8: Vehicle access management and monitoring (VAM)*

— *Part 9: Remote electronic tachograph monitoring (RTM)*

— *Part 10: Emergency messaging system/eCall (EMS)*

— *Part 11: Driver work records (work and rest hours compliance) (DWR)*

— *Part 12: Vehicle mass monitoring (VMM)*

— *Part 14: Vehicle access control (VAC)*

— *Part 15: Vehicle location monitoring (VLM)*

— *Part 16: Vehicle speed monitoring (VSM)*

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— *Part 17: Consignment and location monitoring (CLM)*

— *Part 18: ADR (Dangerous Goods) transport monitoring (ADR)*

— *Part 19: Vehicle parking facilities (VPF)*

The following documents are under preparation:

— *Part 4: System security requirements*

— *Part 13: 'Mass' information for jurisdictional control and enforcement*

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Introduction

Many ITS technologies have been embraced by commercial transport *operators* (4.35) and freight owners, in the areas of fleet management, safety, and security. *Telematics* (4.47) applications have also been developed for governmental use. Such regulatory services in use or being considered vary from *jurisdiction* (4.29) to *jurisdiction* (4.29), but include electronic on-board recorders, digital *remote tachograph monitoring* (4.41), on-board *mass* (4.33) monitoring, "mass" data for regulatory control and management, vehicle *access* (4.1) methods, hazardous goods, and tracking and *e-call* (4.20). Additional applications with a regulatory impact being developed include, fatigue management, speed monitoring, and heavy vehicle penalties and levies imposed.

In such an emerging environment of regulatory and *commercial applications* (4.13), it is timely to consider an overall *architecture* (4.9) (business and functional) that could support these functions from a single platform within a commercial freight vehicle that operate within such regulations. International Standards will allow for a speedy development and *specification* (4.44) of new applications that build upon the functionality of a generic *specification* (4.44) platform. A suite of International Standards deliverables is required to describe and define the *framework* (4.23) and requirements so that the on-board equipment and back office systems can be commercially designed in an open market to meet common requirements of *jurisdictions* (4.30).

This suite of International Standards addresses and defines the *framework* (4.23) for a range of cooperative *telematics* (4.47) applications for *regulated commercial freight vehicles* (4.39) [such as, *access methods* (4.1), *driver* (4.18) fatigue management, speed monitoring, on-board mass, "mass" data for regulatory control, and management]. The overall scope includes the concept of operation, legal and regulatory issues, and the generic cooperative provision of services to *regulated commercial freight vehicles* (4.40), using an on-board ITS platform. The *framework* (4.23) is based on a (multiple) *service provider* (4.42) oriented approach with provisions for the *approval* (4.6) and *auditing* (4.10) of *service providers* (4.42).

This suite of International Standards deliverables will

— provide the basis for future development of cooperative *telematics* (4.47) applications for *regulated vehicles* (4.40). Many elements to accomplish this are already available. Existing relevant International Standards will be referenced, and the *specifications* (4.44) will use existing International Standards [such as *CALM* (4.12)] wherever practicable,

— allow for a powerful platform for highly cost-effective delivery of a range of *telematics* (4.47) applications for *regulated vehicles* (4.40),

— provide a business *architecture* (4.9) based on a (multiple) *service provider* (4.42) oriented approach, and

— address legal and regulatory aspects for the *approval* (4.6) and *auditing* (4.10) of *service providers* (4.42).

This suite of International Standards deliverables is timely as many governments (Europe, North America, Asia, and Australia/New Zealand) are considering the use of *telematics* (4.47) for a range of regulatory purposes. Ensuring that a single in-vehicle platform can deliver a range of services to both government and industry through open standards and competitive markets is a strategic objective.

This part of ISO 15638 provides *specifications* (4.44) for *vehicle "mass" monitoring* (4.52).

NOTE 1 The definition of what comprises a "*regulated*" *vehicle* (4.40) is regarded as an issue for national decision, and can vary from *jurisdiction* (4.29) to *jurisdiction* (4.29). This suite of International Standards deliverables does not impose any requirements on nations in respect of how they define a *regulated vehicle* (4.40).

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NOTE 2 The definition of what comprises a "regulated" service is regarded as an issue for national decision, and can vary from *jurisdiction* (4.29) to *jurisdiction* (4.29). This suite of International Standards deliverables does not impose any requirements on nations in respect of which services for *regulated vehicles* (4.40) *jurisdictions* (4.29) will require, or support as an option, but will provide standardized sets of requirements descriptions for identified services to enable consistent and cost-efficient implementations where implemented.

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

Part 12: Vehicle mass monitoring

1 Scope

This part of ISO 15638 addresses the provision of *vehicle mass monitoring* (VMM) (4.52) and specifies the form and content of such data required to support such systems, and *access methods* (4.1) to that data.

The scope of this part of ISO 15638 is to provide *specifications* (4.44) for common communications and data exchange aspects of the *application service* (4.3) *VMM* (4.53) that a *regulator* (4.30) can elect to require or support as an option, including the following

a) high level definition of the service that a *service provider* (4.42) has to provide, (The service definition describes common service elements; but does not define the detail of how such an *application service* (4.3) is instantiated, not the acceptable value ranges of the data concepts defined),

b) means to realize the service, and

c) application data, naming content and quality that an *IVS* (4.26) has to deliver.

The definition of what comprises a "regulated" service is regarded as an issue for national decision, and can vary from *jurisdiction* (4.29) to *jurisdiction* (4.29). This International Standard does not impose any requirements on nations in respect of which services for *regulated commercial freight vehicles* (4.40) *jurisdictions* (4.29) will require, or support as an option, but provides standardized sets of requirements descriptions for identified services to enable consistent and cost-efficient implementations where instantiated.

ISO 15638 has been developed for use in the context of *regulated commercial freight vehicles* (4.40) (hereinafter, referred to as "*regulated vehicles*" (4.40). There is nothing, however, to prevent a *jurisdiction* (4.29) extending or adapting the scope to include other types of *regulated vehicles* (4.40), as it deems appropriate.

2 Conformance

Requirements to demonstrate conformance to any of the general provisions or specific *application services* (4.3) described in this part of ISO 15638 shall be within the regulations imposed by the *jurisdiction* (4.29) where they are instantiated. Conformance requirements to meet the provisions of this International Standard are therefore deemed to be under the control of, and to the *specification* (4.44) of, the *jurisdiction* (4.29) where the *application service(s)* (4.3) is/are instantiated.

The protocols defined in this part of ISO 15638 have been independently tested. Annex B provides results of these tests.

In any conformance assurance process undertaken by candidate systems, the results can be used, where appropriate, as part of its process of conformance compliance.

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3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15638–1:2012, *Intelligent transport systems — Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 1: Framework and architecture*

ISO 15638–2:2013, *Intelligent transport systems — Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 2: Common platform parameters using CALM*

ISO 15638–3:2013, *Intelligent transport systems — Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 3: Operating requirements, "Approval Authority" approval procedures, and enforcement provisions for the providers of regulated services*

ISO 15638–5:2013, *Intelligent transport systems — Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 5: Generic vehicle information*

ISO 15638–6:2014, *Intelligent transport systems — Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 6: Regulated applications*

4 Terms and definitions

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

4.1
access methods
procedures and protocols to provision and retrieve data

4.2
app
small (usually) Java™[1)] applets, organized as software bundles, that support *application services* (4.3) by keeping the *data pantry* (4.17) provisioned with up-to-date data

4.3
application service
service provided by a *service provider* (4.42) enabled by accessing data from the *in-vehicle system* (IVS) (4.26) of a *regulated vehicle* (4.40) via a wireless communications network

4.4
application service provider (ASP)
party that provides an *application service* (4.3)

4.5
app library
separated secure area of memory in *IVS* (4.26) where apps are stored, with different access controls to *data pantry* (4.17)

4.6
approval
formal affirmation that an applicant has satisfied all the requirements for appointment as an *application service provider* (4.4) or that an *application service* (4.3) delivers the required service levels

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4.7
approval agreement
written agreement made between an *approval authority (regulatory)* (4.8) and a *service provider* (4.42)

Note 1 to entry: An *approval authority (regulatory)* (4.8)*approval agreement* recognizes the fact that a *service provider* (4.42), having satisfied the *approval authority's* requirements for appointment as a *service provider* (4.42), is appointed in that capacity, and sets out the legal obligations of the parties, with respect to the on-going role of the *service provider* (4.42).

4.8
approval authority (regulatory)
organization (usually independent) which conducts *approval* (4.6) and on-going *audit* (4.10) of *service providers* (4.42) on behalf of a *jurisdiction* (4.29)

4.9
architecture
formalized description of the design of the structure of TARV and its *framework* (4.23)

4.10
audit/auditing
review of a party's capacity to meet, or continue to meet, the initial and on-going *approval agreements* (4.7) as a *service provider* (4.42)

4.11
basic vehicle data
data that shall be maintained/provided by all *IVS* (4.26) regardless of *jurisdiction* (4.29)

4.12
communications access for land mobiles
CALM
layered solution that enables continuous or quasi continuous communications between vehicles and the infrastructure, or between vehicles, using such (multiple) wireless telecommunications media that are available in any particular location, and which have the ability to migrate to a different available media where required, and where media selection is at the discretion of *user* (4.48).

Note 1 to entry: It determines parameters by using a suite of International Standards based on ISO 21217 [*CALM* (4.12) architecture (4.9)] and ISO 21210 [*CALM* (4.12) networking] that provide a common platform for a number of standardized media using *ITS-stations* (4.28) to provide wireless support for applications, such that the application is independent of any particular wireless medium.

4.13
commercial application(s)
ITS applications in *regulated vehicles* (4.40) for commercial (non-regulated) purposes

EXAMPLE asset tracking, vehicle and engine monitoring, cargo security, *driver* (4.18) management, etc.

4.14
consignment
shipment of goods/cargo to a destination

4.15
cooperative ITS (C-ITS)
ITS applications for both regulatory and commercial purposes that require the exchange of data between uncontracted parties using multiple *ITS-stations* (4.28), communicating with each other and sharing data with other parties with whom they have no direct contractual relationship to provide one or more *ITS services* (4.27)

4.16
core data
basic vehicle data (4.11) plus any additional data required to provide an implemented *regulated application service* (4.39)

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4.17
data pantry
secure area of memory in *IVS* (4.26) where data values are stored, with different access control to data to *app library* (4.5)

4.18
driver
person driving the *regulated vehicle* (4.40) at any specific point in time

4.19
driver work records
DWR
collection, collation, and transfer of *driver*'s (4.18) work and rest hours data from an *in-vehicle system* (4.26) to an *application service provider* (4.4)

4.20
eCall
specialized instantiation of an *emergency message system* (EMS) (4.21) that provides incident messaging and communication with a public service assistance point via priority wireless telephone communications using its emergency call capabilities

4.21
emergency message system
EMS
collection, collation, and transfer of emergency message data from an *in-vehicle system* (4.26) to an *application service provider* (4.4)

4.22
facilities
layer that sits on top of the communication stack and helps in providing data interoperability and reuse, and in managing applications and enabling dynamic real time loading of new applications

4.23
framework
particular set of beliefs, ideas referred to in order to describe a scenario or solve a problem

4.24
global navigation satellite system
GNSS
comprises several networks of satellites that transmit radio signals containing time and distance data that can be picked up by a receiver, allowing the *user* (4.48) to identify the location of its receiver anywhere around the globe

4.25
global positioning system
GPS
instantiation of *GNSS* (4.24) controlled by the US Department of Defense

4.26
in-vehicle system
IVS
ITS-station (4.28) and connected equipment on board a vehicle

4.27
ITS service
communication functionality offered by an *ITS-station* (4.28) to an *ITS-station* (4.28) application

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4.28
ITS-station
ITS-s
entity in a communication network, comprised of application, *facilities* (4.22), networking, and access layer components specified in ISO 21217 that operate within a bounded secure management domain

4.29
jurisdiction
government, road, or traffic authority which owns the *regulatory applications* (4.38)

EXAMPLE country, state, city council, road authority, government department (customs, treasury, transport), etc.

4.30
jurisdiction regulator
regulator
agent of the *jurisdiction* (4.29) appointed to regulate and manage TARV within the domain of the *jurisdiction* (4.29); might or might not be the *approval authority* (*regulatory*) (4.8)

4.31
local data tree
LDT
frequently updated data concept stored in the on-board *data pantry* (4.17) containing a collection of data values deemed essential for either a) TARV *regulated application service* (4.39), or b) *cooperative intelligent transport systems* (4.15)

4.32
map
spatial dataset that defines the road system

4.33
mass
mass of a given heavy vehicle as measured by equipment affixed to the *regulated vehicle* (4.40)

4.34
mass information for jurisdictional control and enforcement
MICE/MRC
collection, collation, and transfer of vehicle *mass* (4.33) data from an *in-vehicle system* (4.26) to an *application service provider* (4.4) to enable data provision to *jurisdictions* (4.29) for the control and management of equipped vehicles based on the mass of the *regulated vehicle* (4.40), or use of such data to enable compliance with the provisions of regulations

4.35
operator
fleet manager of a *regulated vehicle* (4.40)

4.36
prime mover
heavy-duty commercial vehicle tractor unit which serves as a method of moving trailers (most often semi-trailers) by coupling to the trailer using some sort of mechanical lock system, usually a fifth wheel coupling; tractor units can couple to different types of trailers

4.37
prime service provider
service provider (4.42) who is the first contractor to provide *regulated application services* (4.39) to the *regulated vehicle* (4.40), or a nominated successor on termination of that initial contract

Note 1 to entry: The *prime service provider* is also responsible for maintaining the installed *IVS* (4.26). If the *IVS* (4.26) was not installed during the manufacture of the vehicle, the *prime service provider* is also responsible for the installation and commissioning of the *IVS* (4.26).

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4.38
regulated/regulatory application
application arrangement using TARV utilized by *jurisdictions* (4.29) for granting certain categories of commercial vehicles rights to operate in regulated circumstances subject to certain conditions, or indeed to permit a vehicle to operate within the *jurisdiction* (4.29)

Note 1 to entry: It can be mandatory or voluntary at the discretion of the *jurisdiction* (4.29).

4.39
regulated application service
TARV *application service* (4.3) to meet the requirements of a *regulated application* (4.38) that is mandated by a regulation imposed by a *jurisdiction* (4.29), or is an option supported by a *jurisdiction* (4.29)

4.40
regulated commercial freight vehicle/regulated vehicle
vehicle that is subject to regulations determined by the *jurisdiction* (4.29) as to its use on the road system of the *jurisdiction* (4.29) in regulated circumstances, subject to certain conditions, and in compliance with specific regulations for that class of *regulated vehicle* (4.40); at the option of *jurisdictions* (4.29)

Note 1 to entry: This can require the provision of information via TARV or provide the option to do so.

4.41
remote tachograph monitoring
RTM
collection, collation, and transfer of data from an on-board electronic *tachograph* (4.45) system to an *application service provider* (4.4)

4.42
service provider
party which is approved by an *approval authority (regulatory)* (4.8) as suitable to provide regulated or commercial ITS *application services* (4.3)

4.43
session
wireless communication exchange between the *ITS-station* (4.28) of an *IVS* (4.26) and the *ITS-station* of its *application service provider* (4.4) to achieve data update, data provision, upload apps, or otherwise manage the provision of the *application service* (4.3), or a wireless communication provision of data to the *ITS-station* (4.28) of an *IVS* (4.26) from any other *ITS-station* (4.28)

4.44
specification
explicit and detailed description of the nature and functional requirements and minimum performance of equipment, service, or a combination of both

4.45
tachograph
sender unit mounted to a vehicle gearbox, a *tachograph* head, and a digital *driver* (4.18) card which records the *regulated vehicle* (4.40) speed and the times at which it was driven and aspects of the *driver's* (4.18) activity selected from a choice of modes

4.46
tamper/tampering
conduct towards *IVS* (4.26) or a *service provider's* (4.42) system which is intended to prevent the *IVS* or the *service provider's* (4.42) system from functioning correctly

4.47
telematics
use of wireless media to obtain and transmit (data) from a distant source

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4.48
user
individual or party that enrols in and operates within a regulated or *commercial application* (4.13)*service* (4.3)

EXAMPLE *driver* (4.18), transport *operator* (4.35), freight owner, etc.

4.49
vehicle access control (VAC)
control of *regulated vehicles* (4.40) ingress to and egress from controlled areas and associated regulatory control and management

4.50
vehicle access management
VAM
monitoring and management of *regulated vehicles* (4.40) approaching or within sensitive and controlled areas

4.51
vehicle location monitoring
VLM
collection, collation, and transfer of vehicle location data from an *IVS* (4.26) to an *application service provider* (4.4)

4.52
vehicle mass monitoring
VMM
collection, collation, and transfer of vehicle *mass* (4.33) data from an *IVS* (4.26) to an *application service provider* (4.4)

4.53
vehicle parking facility
VPF
system for booking and *access* (4.1) to and egress from a *vehicle parking facility*

4.54
vehicle speed monitoring
VSM
collection, collation, and transfer of vehicle speed data from an *IVS* (4.26) to an *application service provider* (4.4)

5 Symbols (and abbreviated terms)

AA *approval authority (regulatory)* (4.8)

ADR *Accord Européen relative au transport international des marchandises Dangereuses par Route* (4.6) (dangerous goods)

app *applet* (JAVA™a) application or similar) (4.2)

AS *application service* (4.3)

ASP *application service provider* (4.4)

CALM *communications access for land mobiles* (4.12)

C-ITS *cooperative intelligent transport systems* (4.15)

Dr *driver* (4.18)

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GCM	gross combination *mass* (4.33)
GNSS	*global navigation satellite system* (4.24)
Hz	hertz
ID	identity
IP	internet protocol
ITS-S	*ITS-station* (4.28)
IVS	*in-vehicle system* (4.26)
J	*jurisdiction* (4.29)
Java™[a)]	object-oriented open-source operating language developed by SUN systems
LDT	*local data tree* (4.31)
MMC	*mass* (4.33) monitoring component
Op	*operator* (4.35)
PSP	*prime service provider* (4.37)
SE	service element
TARV	*telematics* (4.47) applications for *regulated commercial freight vehicles* (4.40)
UTC	coordinated universal time
VMM	*vehicle mass monitoring* (4.52)
VMMU	vehicle mass monitoring unit
VMMU-ID	vehicle mass monitoring unit identity/identification
WORM	write once read many times

a This information is given for the convenience of users of this document and does not constitute an endorsement by ISO.

6 General overview and framework requirements

ISO 15638-1 provides a *framework* (4.23) and *architecture* (4.9) for TARV. It provides a general description of the roles of the actors in TARV and their relationships.

To understand clearly the TARV *framework* (4.23), *architecture* (4.9) and detail, and *specification* (4.44) of the roles of the actors involved, refer to ISO 15638-1.

ISO 15638-6 provides the core requirements for all *regulated applications* (4.38). To understand clearly the general context in to which the provision of this application service, refer to ISO 15638-6.

In order to be compliant with this part of ISO 15638, the overall *architecture* (4.9) employed shall comply with ISO 15638-1.

In order to be compliant with this part of ISO 15638, the communications employed shall comply with ISO 15638-2.

In order to be compliant with this part of ISO 15638, the operating requirements employed shall comply with ISO 15638-3.

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In order to be compliant with this part of ISO 15638, the security employed shall comply with ISO 15638-4:—[2)].

In order to be compliant with this part of ISO 15638, the *basic vehicle data* (4.11) shall comply with ISO 15638-5.

In order to be compliant with this part of ISO 15638, the generic conditions for this application service shall comply with ISO 15638-6.

This International Standard has been developed for use in the context of *regulated commercial freight vehicles* (4.40). There is nothing, however, to prevent a *jurisdiction* (4.29) extending or adapting the scope to include other types of *regulated vehicles* (4.40), as it deems appropriate.

7 Requirements for services using generic vehicle data

The means by which the access commands for generic vehicle information specified in ISO 15638-5 can be used to provide all or part of the data required in order to support a *regulated application service* (4.39) as defined in ISO 15638-6.

8 Application services that require data in addition to basic vehicle data

8.1 General

Application services should be conducted as defined in ISO 15638-6.

8.2 Quality of service requirements

This part of ISO 15638 contains no general requirements concerning quality of service. Such aspects shall be determined by a *jurisdiction* (4.29) as part of its *specification* (4.44) for any particular *regulated application service* (4.39). However, where a specified *regulated application service* (4.39) has specific Q of S requirements essential to maintain interoperability, these aspects shall be as specified in Clause 10.

8.3 Test requirements

This part of ISO 15638 contains no general requirements concerning test requirements. Such aspects shall be determined by a *jurisdiction* (4.29) as part of its *specification* (4.44) for any particular *regulated application service* (4.39), and issued as a formal test requirements *specification* (4.44) document. However, where a specified *regulated application service* (4.39) has specific test requirements essential to maintain interoperability, these aspects shall be as specified in Clause 10 relating to this *regulated application service* (4.39), or in a separate standards deliverable referenced within that Clause. Where multiple *jurisdictions* (4.29) recognize a benefit to common test procedures for a specific *regulated application service* (4.39), this shall be the subject of a separate standards deliverable.

8.4 Marking, labelling and packaging

This part of ISO 15638 has no specific requirements for marking labelling or packaging.

However, where the privacy of an individual can be potentially or actually compromised by any instantiation based on this part of ISO 15638, the contracting parties shall make such risk explicitly known to the implementing *jurisdiction* (4.29) and shall abide by the privacy laws and regulations of the implementing *jurisdiction* (4.29) and shall mark up or label any contracts specifically and explicitly drawing attention to any loss of privacy and precautions taken to protect privacy. Attention is drawn to ISO/TR 12859 in this respect.

2) To be published.

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9 Common features of regulated TARV application services

9.1 General

The details of the instantiation of *regulated application service* (4.39) are as designed by the application service system to meet the requirements of a particular *jurisdiction* (4.29) and are not defined herein. ISO 15638-6 specifies the generic roles and responsibilities of actors in the systems, and instantiations that claim compliance with this part of ISO 15638 shall also be compliant with the requirements of ISO 15638-6.

The means by which data are provisioned into the *data pantry* (4.17) and the means to obtain the *TARV LDT* (4.31) and *core data* (4.16) are described in of ISO 15638-6, Clause 8.

In order to minimize demand on the *IVS* (4.26) (which it is assumed will be performing multiple *application services* (4.3) simultaneously, as well as supporting general safety related cooperative vehicle systems), and because national requirements and system offerings will differ, a "cloud" approach has been taken in defining TARV *regulated application services* (4.39).

The TARV approach is for the on-board *app* (4.2) supporting the application service to collect and collate the relevant data, and at intervals determined by the *app* (4.2), or on demand from the *application service provider* (ASP) (4.4), pass that data to the *ASP.* All of the actual application service processing shall occur in the mainframe system of the *ASP* (in the "cloud").

For further information see of ISO 15638-6, Clause 9.

At a conceptual level, the TARV system is therefore essentially simple, as shown in Figure 1. The process is similar to that for CoreData, but data is supplied to a different on-board file in the *data pantry* (4.17).

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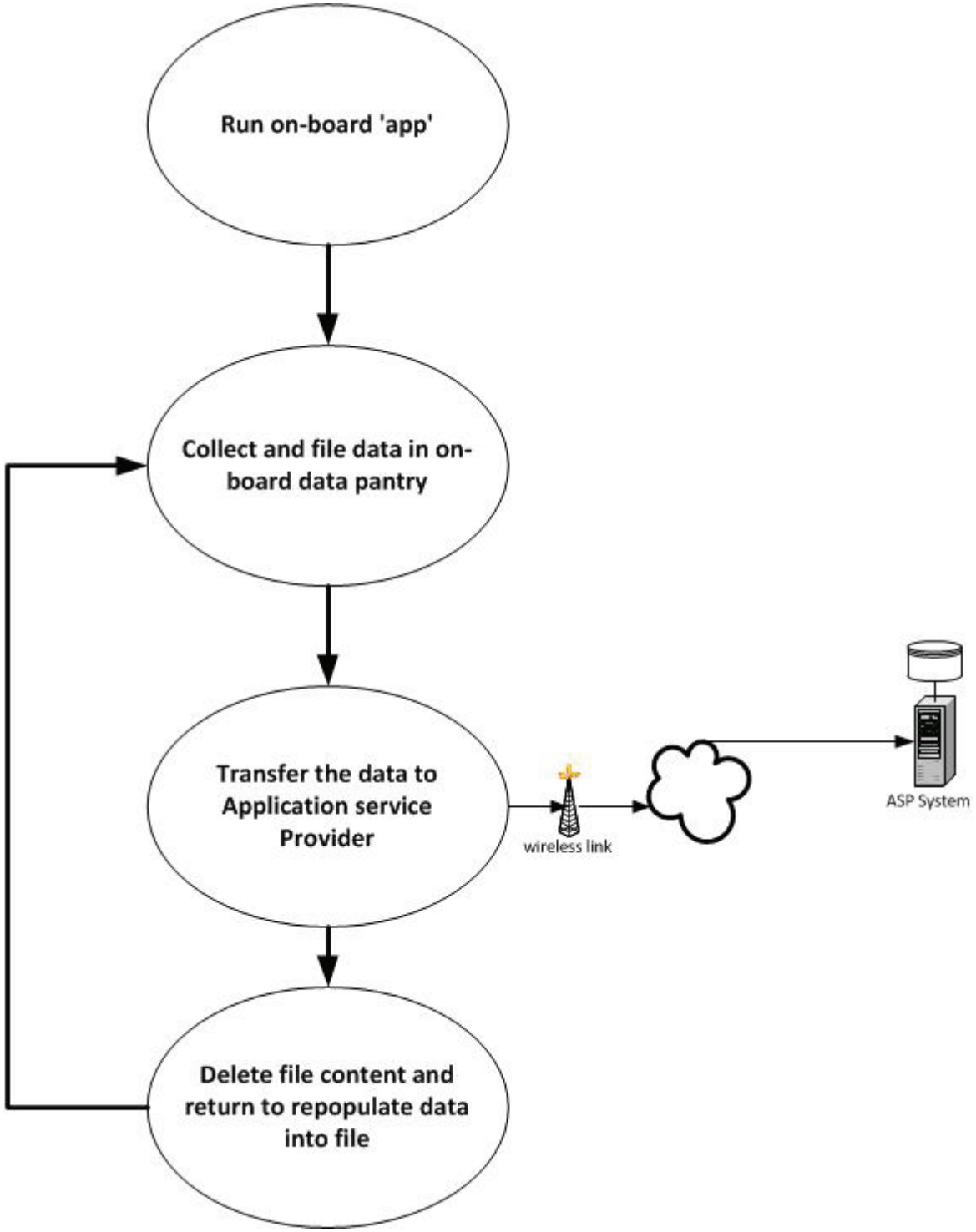

Figure 1 — TARV-regulated application service on-board procedure

At a common generic functional level for this application service, the process can be seen as shown in Figure 2 below, however, the connected equipment might or might not be required in all cases.

9.2 Common role of the jurisdiction, approval authority, service provider and user

The common role of the *jurisdiction* (4.29), *approval authority* (4.8), *application service provider* (4.4), and *user* (4.48) shall be as defined in ISO 15638-6.

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9.3 Common characteristics for instantiations of regulated application services

The common characteristics for instantiations of *regulated application services* (4.39) shall be as defined in ISO 15638-6.

9.4 Common sequence of operations for regulated application services

The common sequence of operations for *regulated application services* (4.39) shall be as defined in ISO 15638-6.

9.5 Quality of service

Generic quality of service provisions for *application services* (4.3) shall be as defined in ISO 15638-6.

9.6 Information security

Information security shall be as defined in ISO 15638-6.

9.7 Data naming content and quality

Data naming and quality shall be as defined in ISO 15638-6

Variations specific to the vehicle "mass" monitoring *application service* (4.3) shall be as defined below.

9.8 Software engineering quality systems

Software engineering quality systems shall be as defined in ISO 15638-6.

9.9 Quality monitoring station

The availability of quality monitoring stations shall be as defined in ISO 15638-6.

9.10 Audits

Audits shall be as defined in ISO 15638-6.

9.11 Access control to data policy

To protect the data and information held by the *application service provider* (4.4), each provider shall adopt a risk based data access control policy for employees of the provider.

9.12 Approval of IVSs and service providers

Generic provisions for the *approval* (4.6) of IVSs and *service providers* (4.42) shall be as specified in ISO 15638-3 (TARV – Operating requirements, *approval* (4.6) procedures, and enforcement provisions for the providers of regulated services). Detailed provisions for specific *regulated applications* (4.38) shall be as specified by the regime of the *jurisdiction* (4.29).

10 Vehicle mass monitoring (VMM)

10.1 TARV VMM service description and scope

10.1.1 TARV VMM use case

On-board *mass* (4.33) measurement refers to a means of measuring the *mass* of a given heavy vehicle with equipment affixed to the *regulated vehicle* (4.40).

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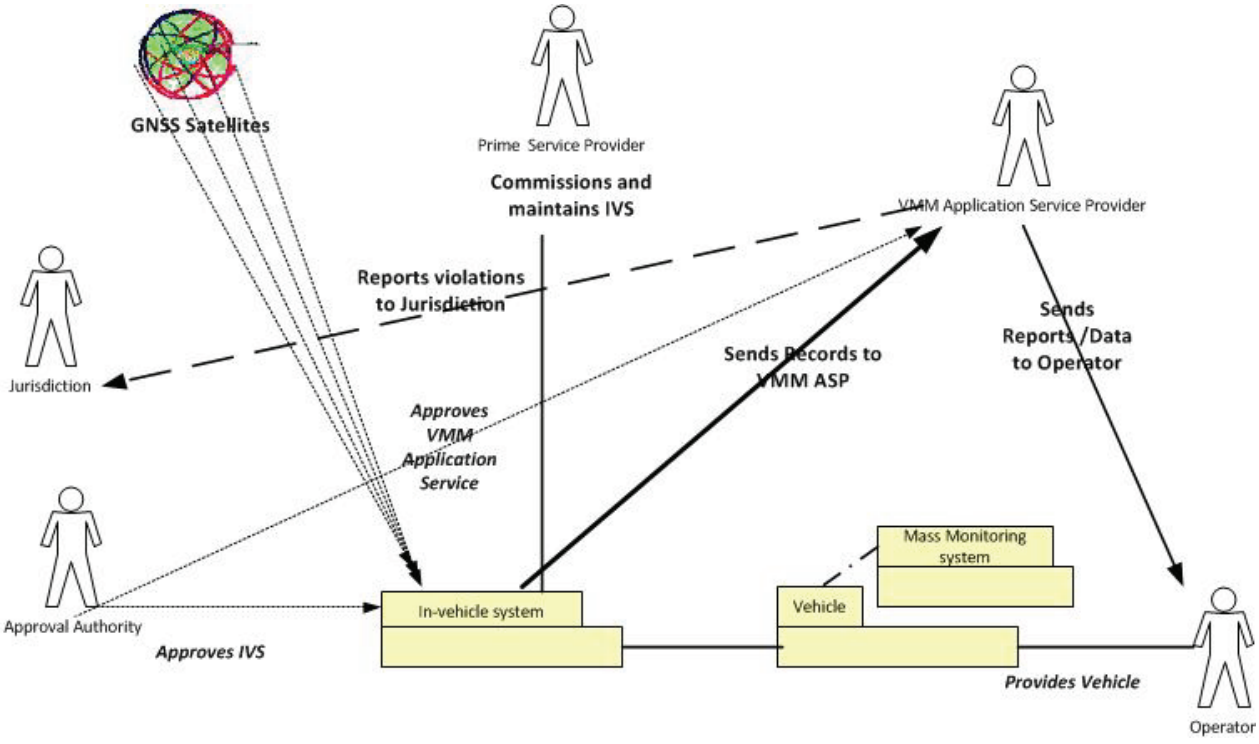

Figure 2 — Vehicle mass monitoring use case

Figure 2 provides an illustration of a TARV *vehicle mass monitoring* (4.52) system. This *application service* (4.3) is described in 10.1.2 and 10.1.3 below.

10.1.2 Description of TARV VMM regulated application service

On-board *mass* (4.33), technology can be used as a means of managing the risk of overloading (non-compliance with "*mass*" limits). Overloading can increase the cost of road infrastructure maintenance by increasing the rate of wear and damage to pavements and bridges.

Overloading of heavy vehicles also has the potential to reduce road safety levels. There are two mechanisms by which the following can occur.

— Heavy vehicle stability is an important factor in minimizing the risk of rollover. As heavy vehicle mass increases, the stability tends to decrease. Grossly overloaded heavy vehicles are often at a greater increased risk of rollover.

— Heavy vehicle braking performance is reduced as mass increases (causing them to take longer to stop).

The additional costs imposed by overloaded vehicles are subsidized by the majority of compliant-heavy vehicle transport sector.

Reduced confidence in mass compliance might over-limit the extent of road network access for higher productivity vehicles.

A demonstrated ability to verify the mass of each load is a cornerstone of the *vehicle mass monitoring* (4.52). The equipment affixed to the *regulated vehicle* (4.40) should be calibrated before initiation of the service and regularly maintained and checked (see 10.2.7 and 10.4.4).

The TARV *vehicle mass monitoring* (4.52) system centres on the *IVS* (4.26) and information provided to it from on-board, advising, and updating on the load status. Vehicle location is generated by the *IVS*'s *GNSS* (4.24) receiver as part of the TARV *basic vehicle data* (4.11), as specified in ISO 15638-5. Vehicle *mass* (4.33) is measured as defined herein. The functions of the stakeholder "actors" in the *vehicle*

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