BS ISO 15638-11:2014

BSI Standards Publication

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

Part 11: Driver work records

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National foreword

This British Standard is the UK implementation of ISO 15638-11:2014. It supersedes PD ISO/TS 15638-11:2013 which is withdrawn.

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

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 80639 1

ICS 03.220.20; 35.240.60

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2014.

Amendments issued since publication

Date	Text affected

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INTERNATIONAL STANDARD

ISO 15638-11

First edition
2014-07-15

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

Part 11: Driver work records

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

Partie 11: Enregistrements du travail des conducteurs

Reference number
ISO 15638-11:2014(E)

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Published in Switzerland

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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 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 15638-11:2013.

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

— *Part 1: Framework and architecture*

— *Part 2: Common platform parameters using CALM*

— *Part 3: Operating requirements, 'Approval Authority' 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*

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

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

— *Part 11: Driver work records*

— *Part 12: Vehicle mass monitoring*

— *Part 14: Vehicle access control*

— *Part 15: Vehicle location monitoring*

— *Part 16: Vehicle speed monitoring*

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— *Part 17: Consignment and location monitoring*

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

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

The following parts 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 (4.31)* and freight owners in the areas of fleet management, safety, and security. *Telematics (4.41)* applications have also been developed for governmental use. Such regulatory services in use or being considered vary from *jurisdiction (4.25)* to *jurisdiction*, but include electronic on-board recorders, digital *tachograph (4.40)*, on-board *mass (4.29)* monitoring, 'mass' penalties and levies, vehicle *access (4.1) methods*, *hazardous goods* tracking, and e-call. Additional applications with a regulatory impact being developed include, fatigue management, speed monitoring, and heavy vehicle penalties imposed based on location, distance, and time.

In such an emerging environment of regulatory and *commercial applications (4.15)*, it is timely to consider an overall *architecture (4.11)* (business and functional) that could support these functions from a single platform within a commercial freight vehicle that operates within such regulations. International Standards will allow for a speedy development and *specification (4.39)* of new applications that build upon the functionality of a generic specification platform. A suite of International Standard deliverables is required to describe and define the *framework (4.21)* 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 (4.25)*.

This International Standard addresses and defines the *framework (4.21)* for a range of cooperative *telematics (4.41)* applications for *regulated commercial freight vehicles (4.35)* [such as *access methods (4.1)*, *driver (4.17)* fatigue management, speed monitoring, on-board '*mass' (4.29)* information for jurisdictional control and enforcement]. The overall scope includes the concept of operation, legal and regulatory issues, and the generic cooperative provision of services to *regulated commercial freight vehicles (4.35)*, using an on-board ITS platform. The *framework* is based on a (multiple) *service provider (4.37)* oriented approach with provisions for the *approval (4.4)* and *auditing (4.10)* of *service providers*.

This International Standard will

— provide the basis for future development of cooperative *telematics (4.41)* applications for *regulated commercial freight vehicles (4.35)*. Many elements to accomplish this are already available. Existing relevant standards will be referenced, and the *specifications (4.39)* will use existing standards (such as *CALM*) wherever practicable,

— allow for a powerful platform for highly cost-effective delivery of a range of *telematics* applications for *regulated commercial freight vehicles (4.35)*,

— a business *architecture (4.9)* based on a (multiple) *service provider (4.37)* oriented approach, and

— address legal and regulatory aspects for the *approval (4.4)* and *auditing (4.10)* of *service providers.*

This International Standard is timely as many governments (Europe, North America, Asia, and Australia/New Zealand) are considering the use of *telematics (4.41)* 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 (4.39)* for 'Driver Work Records'.

NOTE 1 The definition of what comprises a 'regulated' vehicle is regarded as an issue for national decision, and can vary from *jurisdiction (4.25)* to *jurisdiction*. This International Standard does not impose any requirements on nations in respect of how they define a *regulated vehicle (4.35)*.

NOTE 2 The definition of what comprises a 'regulated' service is regarded as an issue for national decision, and can vary from *jurisdiction (4.25)* to *jurisdiction*. This International Standard does not impose any requirements on nations in respect of which services for *regulated vehicles (4.35) jurisdictions* 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 11: Driver work records

1 Scope

This part of ISO 15638 addresses the provision of *'Driver Work Records' (DWR*) *(4.19)* 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 (4.39)* for common communications and data exchange aspects of the *application service (4.3)* driver work records that a *regulator (4.26)* can elect to require or support as an option, including

a) high-level definition of the service that a *service provider (4.37)* 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, nor 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 (4.22)* has to deliver.

The definition of what comprises a 'regulated' service is regarded as an issue for national decision, and can vary from *jurisdiction (4.25)* to *jurisdiction*. This International Standard does not impose any requirements on nations in respect of which services for *regulated vehicles jurisdictions* 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.

This International Standard has been developed for use in the context of regulated commercial freight vehicles [hereinafter referred to as *'regulated vehicles' (4.35)*]. There is nothing, however, to prevent a jurisdiction extending or adapting the scope to include other types of regulated vehicles, 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 (4.25)* 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 of, the *jurisdiction* where the *application service*(s) is/are instantiated.

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, *Intelligent transport systems — Framework for collaborative telematics applications for regulated commercial freight vehicles (TARV) — Part 1: Framework and architecture*

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ISO 15638-2, *Intelligent transport systems — Framework for collaborative telematics applications for regulated commercial freight vehicles (TARV) — Part 2: Common platform parameters using CALM*

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 15638-4:—,[1] *Intelligent transport systems — Framework for collaborative 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 15638-6, *Intelligent transport systems — Framework for collaborative Telematics Applications for Regulated commercial freight Vehicles (TARV) — Part 6: Regulated applications*

ISO 15638-7, *Intelligent transport systems — Framework for collaborative telematics applications for regulated commercial freight vehicles (TARV) — Part 7: Other applications*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15638-1 and the following apply.

4.1
access methods
procedures and protocols to provision and retrieve data

4.2
app
small (usually) Java™[2] applets, organized as software bundles, that support *application services (4.3)* by keeping the *data pantry (4.16)* provisioned with up to date data

4.3
application service
service provided by a *service provider (4.37)*, enabled by accessing data from the *IVS (4.22)* of a *regulated commercial freight vehicle (4.35)* through a wireless communications network

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

4.5
app library
separately secure area of memory in *IVS (4.22)* where apps are stored with different access controls to *data pantry (4.16)*

4.6
approval
formal affirmation that an applicant has satisfied all the requirements for appointment as a *service provider (4.37)* or that an application service delivers the required service levels

1) To be published.

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4.7
approval agreement
written agreement made between an approval authority (regulatory) *(4.8)* and a service provider *(4.37)*

Note 1 to entry: An *approval authority (regulatory) (4.8)* approval agreement recognizes the fact that a *service provider (4.37)*, having satisfied the *approval authority's* requirements for appointment as a *service provider*, 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*.

4.8
approval authority (regulatory)
organization (usually independent) which conducts *approval (4.4)* and on-going *audit (4.10)* for *service providers (4.37)* on behalf of a *jurisdiction (4.25)*

4.9
architecture
formalized description of the design of the structure of *TARV* and its *framework (4.21)*

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 (4.37)*

4.11
basic vehicle data
data that shall be maintained/provided by all *IVS (4.22)*, regardless of *jurisdiction (4.25)*

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 (4.42)* determined parameters by using a suite of International Standards based on ISO 21217 and ISO 21210, that provide a common platform for a number of standardized media using *ITS-stations (4.24)* 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 commercial freight vehicles (4.35)* for commercial (non-regulated) purposes

EXAMPLE Asset tracking, vehicle and engine monitoring, cargo security, driver management, etc.

4.14
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 (4.24)* 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 (4.23)*

4.15
core data
basic vehicle data (4.11) plus any additional data required to provide an implemented *regulated application service (4.34)*

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4.16
data pantry
secure area of memory in *IVS (4.22)* where data values are stored with different access controls to *app library (4.5)*

4.17
driver
person driving the *regulated commercial freight vehicle* at any specific point in time

4.18
driver records device
memory storage device (such as a USB device) used within some (but not all) jurisdictions, with a permanent WORM file containing the details of the drivers licence and drivers work records *(4.19)*

4.19
driver work records
DWR
collection, collation, and transfer of *driver(4.17)* work and rest hours data from an *in-vehicle system (4.22)* to an *application service provider (4.4)*

4.20
facilities
layer that sits on top of the communication stack and helps to provide data interoperability and reuse, and to manage applications and enable dynamic real time loading of new applications

4.21
framework
particular set of beliefs or ideas referred to in order to describe a scenario or solve a problem

4.22
in-vehicle system
IVS
ITS-station (4.24) and connected equipment on board a vehicle

4.23
ITS service
communication functionality offered by an *ITS-station (4.24)* to an *ITS-station* application

4.24
ITS-station
ITS-s
entity in a communication network, comprised of application, *facilities (4.20)*, networking and access layer components specified in ISO 21217 that operate within a bounded secure management domain and also using wireless networks to support general ITS, using any wireless network that is available and supported

4.25
jurisdiction
government, road, or traffic authority which owns the r*egulatory applications (4.33)*

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

4.26
jurisdiction regulator
regulator
agent of the *jurisdiction (4.25)* appointed to regulate and manage *TARV* within the domain of the *jurisdiction*; might or might not be the *approval authority (regulatory) (4.8)*

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4.27
local data tree
LDT
frequently updated data concept stored in the on on-board *data pantry (4.16)* containing a collection of data values deemed essential for either a) *TARV regulated application service (4.34)*, or b) *cooperative intelligent transport systems (4.14)*

4.28
map
spatial dataset that defines the road system

4.29
mass
'mass' of a given heavy vehicle as measured by equipment affixed to the *regulated commercial freight vehicle (4.35)*

4.30
'mass' information for jurisdictional control and enforcement
MICE
MRC
collection, collation, and transfer of *vehicle mass (4.29)* data from an *in-vehicle system (4.22)* to an applic*ation service provider (4.4)* to enable data provision to *jurisdictions (4.25)* for the control and management of equipped vehicles based on the *mass* of the *regulated vehicle (4.35)*, or use of such data to enable compliance with the provisions of regulations

4.31
operator
fleet manager of a *regulated commercial freight vehicle*

4.32
prime service provider
service provider (4.37) who is the first contractor to provide *regulated application services (4.34)* to the *regulated commercial freight vehicle (4.35)*, or a nominated successor on termination of that initial contract; the *prime service provider* is also responsible to maintain the installed *IVS (4.22)*; if the *IVS* was not installed during the manufacture of the vehicle, the *prime service provider* is also responsible to install and commission the *IVS (4.22)*

4.33
regulated application
regulatory application
application arrangement using TARV utilised by *jurisdictions (4.25)* 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*; can be mandatory or voluntary at the discretion of the *jurisdiction*

4.34
regulated application service
TARV application service to meet the requirements of a regulated application that is mandated by a regulation imposed by a *jurisdiction (4.25)*, or is an option supported by a *jurisdiction*

4.35
regulated commercial freight vehicle
regulated vehicle
vehicle that is subject to regulations determined by the *jurisdiction (4.25)* as to its use on the road system of the *jurisdiction* in regulated circumstances, subject to certain conditions, and in compliance with specific regulations for that class of regulated vehicle; at the option of *jurisdictions*; this might require the provision of information through *TARV* or provide the option to do so

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4.36
remote tachograph monitoring
RTM
collection, collation, and transfer of data from an on-board electronic *tachograph (4.40)* system to an *application service provider (4.4)*

4.37
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)*

4.38
session
wireless communication exchange between the *ITS-station (4.24)* of an *IVS (4.22)* 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* of an *IVS (4.22)* from any other *ITS-station*

4.39
specification
explicit and detailed description of the nature and functional requirements and minimum performance of equipment, service or a combination of both

4.40
tachograph
sender unit mounted to a vehicle gearbox, a tachograph head and a digital driver card, which records the *regulated vehicle (4.35)* speed and the times at which it was driven and aspects of the *driver's (4.17)* activity selected from a choice of modes

4.41
telematics
use of wireless media to obtain and transmit (data) from a distant source

4.42
user
individual or party that enrols in and operates within a regulated or *commercial application (4.13) service (4.3)*

EXAMPLE *Driver (4.17)*, transport *operator (4.31)*, freight owner, etc.

4.43
vehicle access control
VAC
control of *regulated vehicles (4.35)* ingress to and egress from controlled areas and associated penalties and levies

4.44
vehicle access management
VAM
monitoring and management of *regulated vehicles (4.35)* approaching or within sensitive and controlled areas

4.45
vehicle location monitoring
VLM
collection, collation, and transfer of vehicle location data from an *in-vehicle system (4.22)* to an *application service provider (4.4)*

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4.46
vehicle mass monitoring
VMM
collection, collation, and transfer of vehicle *mass(4.29)* data from an in-vehicle system (*4.22*) to an application service provider (*4.4*)

4.47
vehicle parking facility
VPF
system for booking and *access(4.1)* to and egress from a vehicle parking facility (VPF)

4.48
vehicle speed monitoring
VSM
collection, collation, and transfer of vehicle speed data from an *in-vehicle system (4.22)* to an *application service provider (4.4)*

5 Symbols and abbreviated terms

AA *approval authority (regulatory) (4.8)*

ADR *Accord européen relatif au transport international des marchandises Dangereuses par Route (4.5)* (*dangerous goods*)

app applet (Java™[a]) application or similar) *(4.2)*

AJ agent of jurisdiction

AS application service

ASP *application service provider (4.4)*

CALM *communications access for land mobiles (4.12)*

CAN *controller area network*

C-ITS *cooperative intelligent transport systems (4.14)*

DLR driving licence reader

Dr driver *(4.17)*

DRD *driver records device (4.18)*

DWR *driver work records (4.19)*

eDL electronic *driver (4.17)* licence

GNSS global navigation satellite system

H&S health and safety

HDOP horizontal dilution of precision

ID identity

IP internet protocol

ITS-S *ITS station (4.24)*

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IVS	*In-vehicle system (4.22)*
J	jurisdiction *(4.25)*
Java™a)	object-oriented open-source operating language developed by SUN systems
LDT	*local data tree (4.27)*
MICE	'Mass' information for control and enforcement
MRC	*'mass' data for regulatory control and management*
Op	operator *(4.31)*
PDA	personal data assistant/personal digital assistant
PSP	prime service provider *(4.32)*
RTM	*remote tachograph monitoring (4.36)*
SD	service detail
SDD	'Self-declaration' device
SE	service element
SPF	*secure parking facility*
TARV	*telematics (4.41)* applications for *regulated vehicles (4.35)*
USB2	universal serial bus 2
UTC	coordinated universal time
VAC	*vehicle access control (4.43)*
VAM	*vehicle access management (4.44)*
VLM	*vehicle location monitoring (4.45)*
VMM	*vehicle mass monitoring (4.46)*
VSM	*vehicle speed monitoring (4.48)*
VSP	*vehicle secure parking (4.47)*
WORM	write once read many (times)
WRE	work record element
WWD	written work diary

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6 General overview and framework requirements

ISO 15638-1 provides a *framework (4.21)* 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, *architecture (4.9)*, and detail and *specification (4.39)* of the roles of the actors involved, the reader is referred to ISO 15638-1.

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ISO 15638-6 provides the core requirements for all regulated applications. To understand clearly the general context in to which the provision of this application service, the reader is referred to ISO 15638-6.

In order to be compliant with this part of ISO 15638, the overall architecture 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.

In order to be compliant with this part of ISO 15638, the security employed shall comply with ISO 15638-4:—[3].

In order to be compliant with this part of ISO 15638, the basic vehicle data 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. There is nothing, however, to prevent a jurisdiction extending or adapting the scope to include other types of vehicles which it elects to regulate, 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 (4.34)* shall be as defined in ISO 15638-6.

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

8.1 General

Application services shall 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 (4.25)* as part of its *specification (4.39)* for any particular *regulated application service (4.34).* However, where a specified *regulated application service (4.34)* has specific quality of service 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 (4.25)* as part of its *specification (4.39)* for any particular *regulated application service (4.34),* and issued as a formal test requirements *specification (4.39)* document. However, where a specified *regulated application service (4.34)* has specific test requirements essential to maintain interoperability, these aspects shall be as specified in Clause 10, relating to this *regulated application service,* or in a separate standards deliverable referenced within that clause. Where multiple *jurisdictions* recognize a benefit to common test procedures for a specific *regulated application service,* this shall be the subject of a separate standards deliverable.

3) To be published.

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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 International Standard, the contracting parties shall make such risk explicitly known to the implementing *jurisdiction (4.25)* and shall abide by the privacy laws and regulations of the implementing *jurisdiction,* 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.

9 Common features of regulated TARV application services

9.1 General

The details of the instantiation of *regulated application service* (*4.34*) are as designed by the application service system to meet the requirements of a particular *jurisdiction* (*4.25*) 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* (*4.16*), and the means to obtain the *TARV LDT* (*4.27*) and *core data* (*4.15*) are referenced in ISO 15638-6, Clause 8 and defined in ISO 15638-5, 8.2, 8.3, and 8.4.

In order to minimize demand on the *IVS* (*4.22*) [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* (*4.34*).

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 (4.4) (ASP),* 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 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 are supplied to a different on-board file in the *data pantry* (*4.16*).

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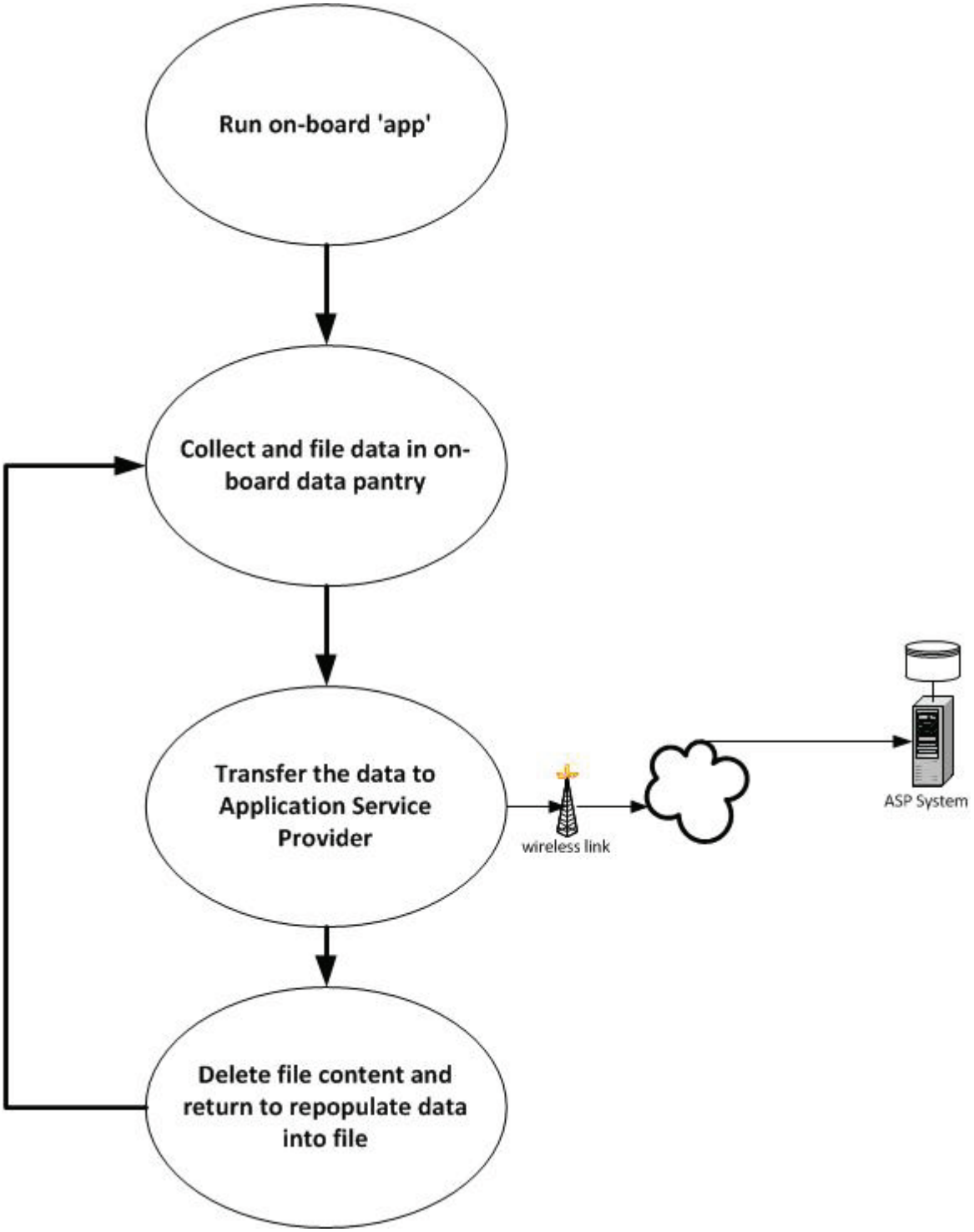

Figure 1 — TARV regulated application service on-board procedure

At a common generic functional level for this application service, the process can be seen as shown in Figure 2, however, the connected equipment might/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, approval authority, application service provider, and user 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 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 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 driver work records *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 Data access control 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* (4.37) shall be as specified in ISO 15638-3. Detailed provisions for specific *regulated applications* (4.33) shall be as specified by the regime of the *jurisdiction* (4.25).

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10 TARV driver work records (*DWR*)

10.1 (Electronic) Driver work records service description and scope

10.1.1 TARV DWR use case

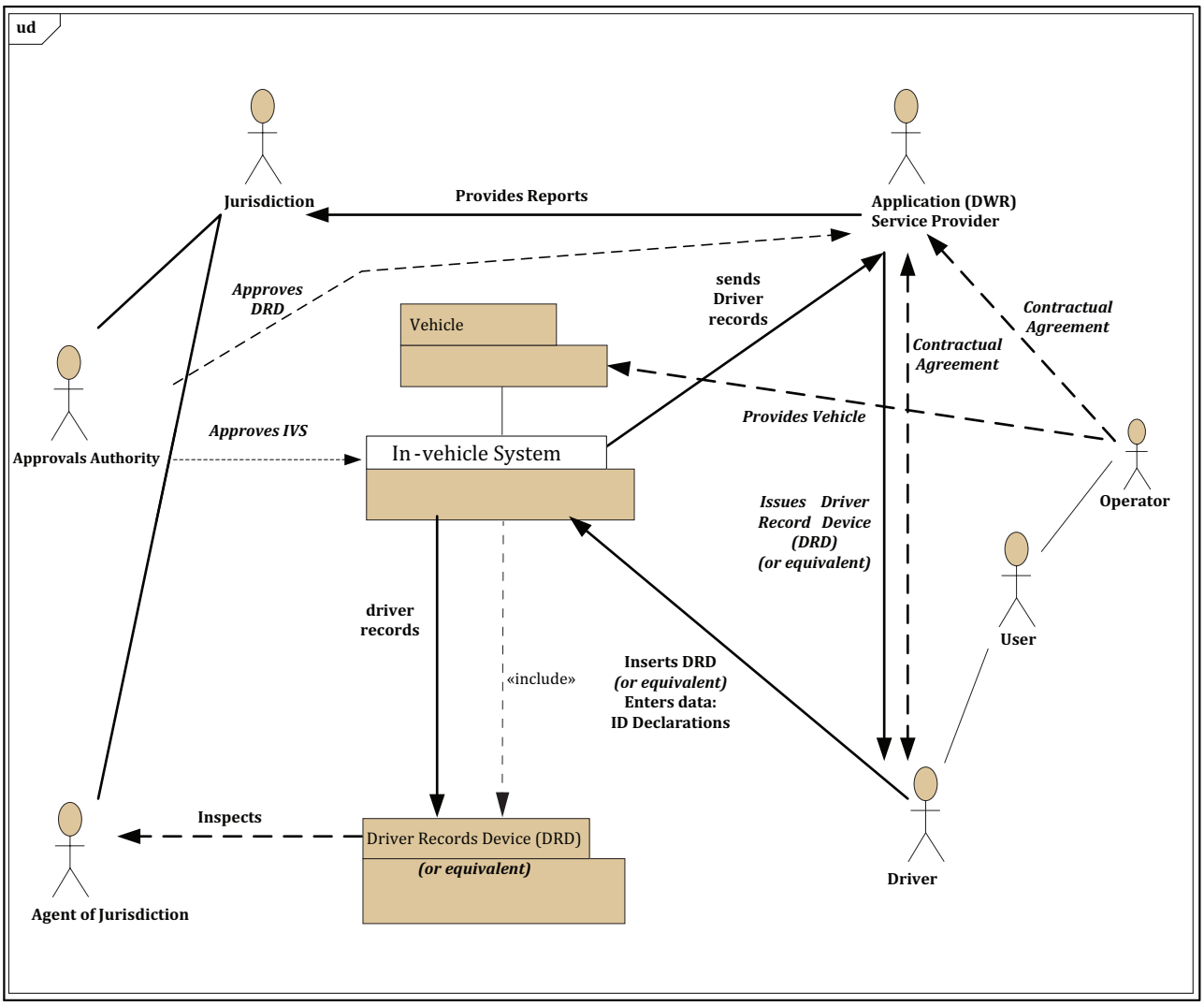

Figure 2 — TARV driver work record (DWR) use case

NOTE In Figure 2, *DRD (4.18)* means a physical *DRD* as specified herein or other means as specified by the jurisdiction (4.22). See 10.2.1.1.

Figure 2 provides an illustration of a *driver work records (4.19)* recording system. This application service is described in 10.1.2.

10.1.2 Description of TARV DWR application service

The *driver work records (4.19)* (*DWR*) application service can exhibit itself in slightly different forms in different *jurisdictions (4.25)*. For some, it can be an issue of mandatory compliance; in others, health and safety; and yet, in others, only a support for employee records. It might or might not involve compliance actions. It can be mandatory as an electronically provided service in some *jurisdictions*; in others, providing this information can be manual or electronic, in which event, this service definition applies only to the electronic provision through *TARV*. Within other *jurisdictions,* it can just be an option for good practice. In each case, the use case shown in Figure 2 will vary slightly. It is likely to be named

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differently according to its origin and the regulatory environment in which it instantiates. 'Driver hours monitoring', 'Driver hours compliance', 'Electronic work diary', '*Driver work records (4.19)*', etc. being other typical example names for this type of *application service (4.3).*

This application service differs from electronic *tachograph (4.40)* monitoring, in that, it is designed to be *driver (4.17)* led, creating a record of his/her work history.

The exact nature and form of the requirements and reports will vary from instantiation to instantiation, and such detail is not standardized in this part of ISO 15638. This part of ISO 15638 specifies the basic *architecture (4.9)* and information needed to support this type of application service using *TARV*, so that the *in-vehicle system (4.22)* can satisfy the requirements of any likely instantiation by a different *jurisdiction (4.25)/application service provider (4.4),* or so that the *regulated vehicle (4.35)* and equipment can support the different requirements of different *jurisdictions* when the *regulated vehicle* and *driver (4.17)* are operating within their domain.

Figure 2 shows an example use case, appropriate where reports are required by the *jurisdiction (4.25)* and where compliance is also monitored, such that, transgression can result in an offence/prosecution, perhaps the most comprehensive example of the *DWR application service (4.3).*

The reader should be aware that, within any jurisdiction, legislative privacy requirements for the road operator, vehicle operator, and driver, can be different.

10.2 Concept of operations for (electronic) DWR

10.2.1 General

10.2.1.1 A DWR system can be based on

a) a driver records device (DRD) *(4.18)*, and

b) an alternative means, designated by a *jurisdiction (4.22),* to achieve the same result.

Any alternative means has to recognize that without the *DRD*, an alternative standardized method to achieve interoperability is required.

This standard recognizes that the *DRD (4.18)* provides an interoperable mechanism for driver record transfer and display and review at the roadside. However, the *DRD* is only one such way to achieve this. Instantiations of this standard can use other means designated by a *jurisdiction (4.22).* Any such alternative means shall be specified and declared by the jurisdiction.

This part of ISO 15638 specifies how a *DRD (4.18),* if used, shall be used, and provides an example of the general requirements for interoperability in the event that other means are designated by a jurisdiction.

10.2.1.2 The service concept is that a *driver (4.17)* is equipped with a portable memory device (*Driver Records Device), (DRD) (4.18),* or other means specified by the *jurisdiction (4.22).* The form of such *DRD* is not defined, but such can be a USB2/USB3 memory stick, which he/she connects to the *IVS (4.22)* whenever driving the *regulated vehicle (4.35).* The *DRD* also contains a permanent WORM file containing the details of the *drivers (4.17)* licence.

Alternatively, the IVS can be loaded with an '*app*' *(4.2)* that securely identifies and authenticates the driver, and provides a suitable means to acquire driver's relevant data. Either the *DRD (4.18)* or the *'app' (4.2)* or a combination of both, in accordance with the procedures defined by the *jurisdiction (4.25),* identifies the driver to the *IVS* every time he/she takes control and plugs in his/her *DRD*, or completes the log-in procedure. The *IVS (4.22)* records hours and additional information and reports this at regular intervals to the *application service provider (4.4).*

Where a *DRD (4.19)* is used, the *IVS* shall also copy the records onto the *DRD*.

NOTE For system designers: A complication is the ability to log working hours when not actually driving (for example loading) and to record rest hours.

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10.2.1.3 The main application service is provided landside by the *application service provider (4.4),* who prepares, compiles, and sends reports to meet the requirements of the *jurisdiction* (4.25) and its client [who can be the *regulated vehicle* (4.35) *operator* (4.31) or the *driver* (4.17)].

10.2.1.4 Where a *DRD* (4.18) is used, the *IVS* (4.22) also records the *driver's* (4.17) records to the 'driver records device' (*DRD*). This device can be accessed by an agent of the *jurisdiction* (4.25) (inspector, enforcement officer etc.), and provides a long term evidence record of the *drivers* (4.17) *driver work records* (4.19) history.

NOTE If the daily record is kept to about 100kb or less, a year's records are therefore below 0.04 GB, so a 2GB/4GB memory stick will hold nearly 50/100 years of work records, in the event of 200kb per day, that is 25/50 years work records.

10.2.1.5 The objective of this part of ISO 15638 is to provide the data required for the *application service provider (4.4)* to be able to design and run its *application service* (4.3), and provide data to populate the *DRD* (4.18), and for a *jurisdiction* (4.25) to be able to monitor and enforce.

The sequence of operations using *TARV* is defined; the data requirement and format are defined. The format of data stored in the *DRD* (4.18) is also defined.

10.2.2 Statement of the concept of the TARV DWR system

The concepts for TARV DWR are as follows:

The use case for TARV DWR (or its substitute) with the roles, tasks, and entities combined in one diagram, is shown in Figure 2.

The *prime service provider (4.32)* or an entity appointed by the *jurisdiction (4.25)* [driver records device issuer in the case where *DRDs (4.18)* are used] supplies drivers *(4.17)* with *driver record devices (DRD),* or in the case where *DRDs* are not used provides instruction for access and authentication, and where appropriate, reports the issuance (tying together the *DRD* identity and the driver identity) to the jurisdiction or its appointed agent. A 'Drivers Work Record' number to a scheme devised by the *jurisdiction* can be used to provide a unique reference, or the drivers licence number, or the ID number of the first *DRD* device issued to the *driver (4.17)* can be used, at the discretion of the *jurisdiction*. Where *DRDs* are used, it is the responsibility of the jurisdiction to ensure that there is only one *DRD* device per driver if the jurisdiction is relying on this device to monitor/evidence driver conformance.

The *in-vehicle system (4.22)* (IVS) and, where appropriate, the driver records device (*DRD*) *(4.18)* are the technical components of the TARV DWR system out in the field and shall be used by drivers to meet the requirements of the jurisdiction and the *operator (4.31).*

The *prime service provider (4.32)/application service provider (4.4)* collects records and provides services in reporting, as required, to all approved entities in the chain of responsibility who, for TARV DWR, are the jurisdictions or their appointed agents, and *users (4.42)* [which in this case are both *vehicle operators* (4.31) and *drivers* (4.17)].

The *application service provider* (4.4) is responsible to report to the *approval authority (regulatory)* (4.8) of the jurisdiction concerning the overall TARV DWR system in the discharge of responsibilities related to *approval* (4.6) and auditing (4.10).

Where used, the driver records device *(DRD)* (4.18) shall use standard equipment such as USB2/USB3 and data storage in a consistent format, and as a result, is interoperable across TARV *IVSs* (4.22) that are equipped to interface to a *DRD*.

The core of any management system for DWR shall rest within a system operated by an ASP to meet the requirements of its *jurisdiction* (4.25). That system, its processes, accessibility to drivers, and the jurisdiction, shall be to meet local requirements determined by the *jurisdiction.* However, there are two approaches that are embraced by ISO 15638-11:

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A system where the driver is issued with a secure electronic storage medium [such as a USB2, USB3, or similar, etc.), which contains WORM (write once read many) (times)] data regarding the *Driver (4.17)* and his license, and maintains a copy of the driving record in WORM memory as it is updated.

A system where the *driver (4.17)* identifies and authenticates himself to the system by a means determined by the *jurisdiction (4.25),* where he does not have an electronic copy of his driving record held in a *DRD (4.18)*, but has a means to access that record directly from the *ASP (4.4)* in conditions determined and controlled by the *jurisdiction*.

10.2.3 Strategies, tactics, policies, and constraints affecting the TARV DWR system

The first strategic decision in order to claim compliance to this part of ISO 15638 is that the issuer of the *DRD (4.18)* [*jurisdiction (4.25), prime service provider (4.32),* or *application service provider (4.4),* according to the regime of the *jurisdiction*] creates a permanent 'Driver Work Record' in the system of the *ASP (4.4).* The record held by the *ASP* shall be considered as the prime 'Driver Work Record'.

In the case that the system does not utilize an electronic *DRD (4.18)*, the *ASP (4.4)/jurisdiction (4.25),* shall make arrangements to provide the driver with a means to identify himself/herself to the vehicle and to the *ASP* system, in order to gain legitimate access to his/her records.

Where a *DRD (4.18)* is used, that system shall copy into a WORM (write once read many) file on the *DRD* the full details of the drivers (4.17) licence as they would be stored in any eDriving licence. If the detail of the driving licence changes, the driver shall be issued with a new *DRD* with a new WORM driving licence detail file, and the application service provider shall upload the drivers work record history to date onto the new *DRD*.

NOTE This avoids the need for the *TARV DWR* system to require an automatic driver licence reader to be connected to the *IVS (4.22)*, and it simplifies the process in practical terms for the *driver (4.17).* When the *driver* takes control of the *regulated vehicle (4.35)*, he/she plugs in their *DRD (4.18)*; that both enables the *TARV DWR* system and identifies the *driver.*

Other principal issues that affect this system, over and above any general *TARV* issues, are threefold.

a) First, whether the DWR system is based on a *driver records device (DRD) (4.18)* or an alternative means, designated by a *jurisdiction (4.22),* to achieve the same result. (See 10.2.1.1).

   This part of ISO 15638 recognizes that the *DRD (4.18)* provides an interoperable mechanism for driver record transfer and display and review at the roadside. However, the *DRD* is only one such way to achieve this. Instantiations of this part of ISO 15638 can use other means designated by a *jurisdiction (4.22).* Any such alternative means shall be specified and declared by the jurisdiction.

   This part of ISO 15638 specifies how a *DRD (4.18),* if used, shall be used, and provides an example of the general requirements for interoperability in the event that other means are designated by a jurisdiction.

b) Second, the choice of medium for any *driver records device* (*DRD*) *(4.18).* This shall be a secure electronic storage medium (such as a USB2, USB3, or similar, etc.), which contains WORM (write once read many) data regarding the *Driver (4.17)* and his license, and maintains a copy of the driving record in WORM memory as it is updated. There are many formats of portable memory available that would be suitable; but there needs to be one type of device selected within a jurisdiction, otherwise it can be difficult for a *driver* to move from one vehicle to another. The selected device type needs to be reasonably robust, and of a size format which is easy to use even wearing gloves, or with dirty hands. It is relatively impervious to ingress of dust etc.

c) The third, and more difficult issue, is about the recording of non-driving hours and rest hours. A *driver (4.17)* can spend time on other activities than driving (for example loading/unloading, waiting time) that counts towards the number of hours that he/she is allowed to work. Means have to be provided to enable this recording to take place. At some point in the future, it might be possible to standardize on a single means to achieve this. At the time of developing this deliverable, this has to be left to a marketplace solution and a requirement solely based on what has to be provided, and not the means by which it is provided. It can be in-vehicle, it can be that in-vehicle processes

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