DRAFT INTERNATIONAL STANDARD
ISO/DIS 18495-1.2

ISO/TC **204**

Voting begins on:
2015-08-17

Secretariat: **ANSI**

Voting terminates on:
2015-10-17

Intelligent transport systems — Commercial freight — Automotive visibility in the distribution supply chain —

Part 1:
Architecture and data definitions

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ICS: 03.220.01; 35.240.60

Reference number ISO/DIS
18495-1.2:2015(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO DIS 18495-1 was prepared by Technical Committee ISO/TC 204, Intelligent transport systems, working Group 7, *Commercial freight and fleet*.

ISO 18495-1 is the first of potentially several parts of this family of Standards deliverables relating to automotive visibility in the distribution supply chain. Subsequent Parts will provide specifications for particular aspects within this architecture.

Introduction

The *automotive* [4.2] *distribution supply chain* [4.8], which includes newly manufactured *vehicles* [4.14], second hand *vehicles*, industrial machines, construction machines and agricultural equipment (but particularly that for the supply of newly manufactured *vehicles*] and machines), can be defined as a logistics chain from *point of origin* [4.11] to an intended *destination* [4.6]. The related parties are many, consisting of *automotive* manufactures, dealers, truckers, terminal operators, shipping lines, tally body, customs authorities, *automotive* dealers and other logistic related companies such as labelling, forwarding, stevedoring among others, and this complexity makes the *distribution chain* [4.7] difficult to control and financially inefficient. Most of the logistics process occurs at land transport and parks of new manufactured and used *automotive* terminals, both prior to international shipping and post international shipping.

Most *distribution supply chain* [4.8] operations that manage the movement of *automobiles* [4.2] through the *distribution supply chain* are currently handled manually, on a company by company basis, and generate a very significant amount of paperwork, which is duplicated at each stage throughout the *distribution chain* [4.7], causing duplication of un harmonised data and difficulty in matching these different *data concepts* [4.4] associated with a single item in shipment.

Transport movements are made by international shippers and forwarders, and not on a single company basis. Inconsistent availability and format of data creates problems in the management of the *distribution chain* [4.7].

The many parties involved in the *distribution supply chain* [4.8], and lack of data or inconsistency in its format and presentation, causes inefficient land transport, and highly labour intensive and complicated operations in terminals, and increases the required minimum stock levels required to assure contingency of supply in order to avoid stock-out situations.

Further, it is very common for dealers to request changes of finished *vehicle* [4.14] options and *destination* [4.6] based on final customers request in an actual business environment, this is complex and difficult to achieve without visibility throughout the *distribution supply chain* [4.8].

Improving the efficiency of the *automotive* [4.2] *distribution supply chain* [4.8] will make a significant contribution to reducing pollution, reducing waste of finite resources, and reduction of environmental problems.

Considerable work and effort has already been undertaken to formalise, harmonise and standardise the documentation and the formal business processes associated with the documentation management of the automotive *supply chain* [4.13] for finished *vehicles* [4.14], and these processes and *data concepts* [4.4] are acknowledged and accepted with regards to the formal documentation processing and management of such systems. The existing (and standardised) *supply chain* documentation and data processing are not affected by this International Standard, which is complementary to those processes, and designed mostly for use by logistics operators. However, unlike many items in *supply chains*, *automotives* [4.2] can be, and are, informally physically moved around car parks and holding centres during the logistics of operations.

As there are many existing practices within the process of *automotive* [4.2] fabrication, and very local practices within dealers, it is recognised that these aspects of *vehicle* [4.14] build and delivery will have their own domestic *architectures* [4.1]; similarly there are established practices and procedures on the maritime leg of the journey. However, if the manufacturer, dealer, shipper or dealer wishes, at their option, to extend this *architecture* and data definitions into their domains, this *architecture* enables them to do so, should they so elect to do.

This International Standard establishes a *framework* [4.9] and *architecture* [4.1] for data collection of the physical movement of *vehicles* [4.14], construction machinery, and agricultural equipment, in the *distribution chain* [4.7] between a *point of origin* [4.11] (start of logistics movement) and an intended *destination* [4.6], and provides a means to monitor their actual physical movement at and between various stages of the

distribution supply chain [4.8], including informal movements within any of these stages/locations, and provides consistent data *architecture*, harmonized *data concepts* [4.4] and presentation for such data.

Intelligent transport systems - Commercial freight - Automotive visibility in the distribution supply chain - Part 1 Architecture and data definitions

1   Scope

This International Standard establishes a *framework* [4.9] and *architecture* [4.1] for data collection and to provide data definitions for visibility of *vehicles* [4.14], self-propelled construction machinery, and agricultural equipment, (hereinafter referred to as '*automotives*' or 'automobiles'[4.2]) in the *distribution supply chain* [4.8] between a *point of origin* [4.11] (start of logistics movement) and an intended *destination* [4.6].

This architecture [4.1] is designed to cover any undocumented movements at any location. The scope of this International Standard is to

- a) Enable dynamic location within a storage area/compound
- b) Provide consistent use of the ISO 3779/3780 VIN (where available) as the prime identifier
- c) Where a VIN is not available, provide consistent and standardised identification throughout the distribution chain [4.7] movement

NOTE 1: The scope of this part does not standardise the data carriers or their interrogation means.

NOTE 2: This International Standard is expected to be the first part of multipart standard relating to this subject.

NOTE 3: This specification is complementary to, and does not replace any *supply chain* [4.13] documentation standardised and in use by JAIF or ODETTE in the new *vehicle* [4.14] supply chain, nor does it impose any specification or change on the representation, nor exchange of, their *data concepts* [4.4] nor documentation.

NOTE 4: The movement of automobiles within containers is outside of the scope of this International Standard.

2   Conformance

No specific conformance requirements are specified in this International Standard.

3 Normative references

The following referenced documents are indispensable for the application 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 3779   Road vehicles -- Vehicle identification number (VIN) -- Content and structure

ISO 3780   Road vehicles -- World manufacturer identifier (WMI) code

ISO 6709   Standard representation of latitude, longitude and altitude for geographic point locations

ISO 8601   Data elements and interchange formats -- Information interchange -- Representation of dates and times

ISO 14816   Road transport and traffic telematics – Automatic vehicle and equipment identification – Numbering and data structure

ISO 14817-1 Intelligent transport systems -- ITS central data registry -- Part 1: Requirements for an ITS central data registry

ISO 14817-2 Intelligent transport systems -- ITS central data registry -- Part 2: Governance of the Central ITS Data Concept Registry

ISO 14817-3 Intelligent transport systems -- ITS central data registry and data dictionaries -- Part 3: Object identifier assignments for ITS data concepts

ISO/IEC 15459 Information technology -- Unique identifiers (multiple parts)

ISO/TS 15000-5:2005 Electronic Business Extensible Markup Language (ebXML)— Part 5: ebXML Core Components Technical Specification, Version 2.0

ISO 17262   Intelligent transport systems -- Automatic vehicle and equipment identification -- Numbering and data structures

ITU E.164   The international public telecommunication numbering plan

UNECE Rec .24   Recommendation No. 24 Trade And Transport Status Codes

4 Terms and definitions

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

4.1
architecture
fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and its *framework* [4.9]

4.2
automobile/automotive
any self propelling motorized *vehicle* [4.14]; including cars, vans, trucks, self propelling construction machinery, and self propelling agricultural equipment. See also *vehicle* [4.14].

4.3
current location
physical position at the time of the enquiry

4.4
data concept
characterisation which describes and defines the essential features of a distinct entity such as a *data element* [4.5], group of data entities or metadata, normally described by defining all or some of its object class, properties, value domain, *data element* concept, *data element*, data frame, message, interface dialogue, associations, but does not define the specific value domain.

NOTE   *Data concepts* [4.4] can be classified into the following categories: object class, value domain, *data element*, aggregate domain, data frame, message, interface dialogue, dictionary document, term, symbol, or module

4.5
data element
The union of a specific *data concept* [4.4] with a specific value domain creates a *data element*; for example the *Person-date of birth* can be combined with the *Date DDMMYYYY* value domain to create the *data element*: *Person-date of birth, DDMMYYYY*; alternatively the *data element* could formed using the *Date YYYY* value domain making a distinct *data element Person"*

4.6
destination, destination location
most recently updated end point of the journey

4.7
distribution chain
the series of businesses or organizations that are involved in transporting, storing, and selling goods to customers (Cambridge ED) (see also *distribution supply chain* [4.8] and *supply chain* [4.13])

4.8
distribution supply chain
process of transportation and distribution (of vehicles and mobile plant and equipment) through a *distribution chain* [4.7]

4.9
framework
particular set of beliefs or ideas referred to in order to describe a scenario or solve a problem

4.10
location type
function of the facility/point where the data was collected

4.11
point of origin
start point of a logistical movement of an *automotive* [4.2] to a *destination* [4.6]

4.12
status definition
identifier indicating whether the *automotive* [4.2] is 'Not Ready' or 'Ready' for the next function of the facility or the next READ POINT of the journey.

4.13
supply chain
the system of organizations, people, activities, information, and resources involved in moving a (new) product or service from supplier to customer (OED): see also *distribution chain* [4.7] and *distribution supply chain* [4.8]

4.14
vehicle
automobile [4.2] such as automotive, van, truck, tractor unit, self-driven agricultural equipment, self-driven construction equipment; the term vehicle within the context of this international Standard, embraces all forms of self-driven automotive.

4.15
VIN
structured combination of characters assigned to a vehicle [4.12] by the manufacturer for identification purposes as defined in ISO 3779 and ISO 3780 (See Annex B)

5   Symbols (and abbreviated terms)

For the purposes of this document, the following symbols and abbreviated terms apply:

ASN.1	Abstract Syntax Notation One
DD	Delivery to Destination
DFE?	Destination Final Egress
DPT	Despatching Port Terminal
DVP	Dealer Vehicle Park
FVP	Finished Vehicle Park**M** mandatory
MT	Marine Transport
O	optional
PoO	Point of Origin
RPT	Receiving Port Terminal
UML	Unified Modelling Language
VIN	vehicle identification number (ISO 3779/3780)
XML	Extensible Markup Language

6 General requirement

6.1 Business modelling and core use cases

A high level Unified Modelling Language (UML) view of the business process actors and their data dependencies is shown in Figure 1.
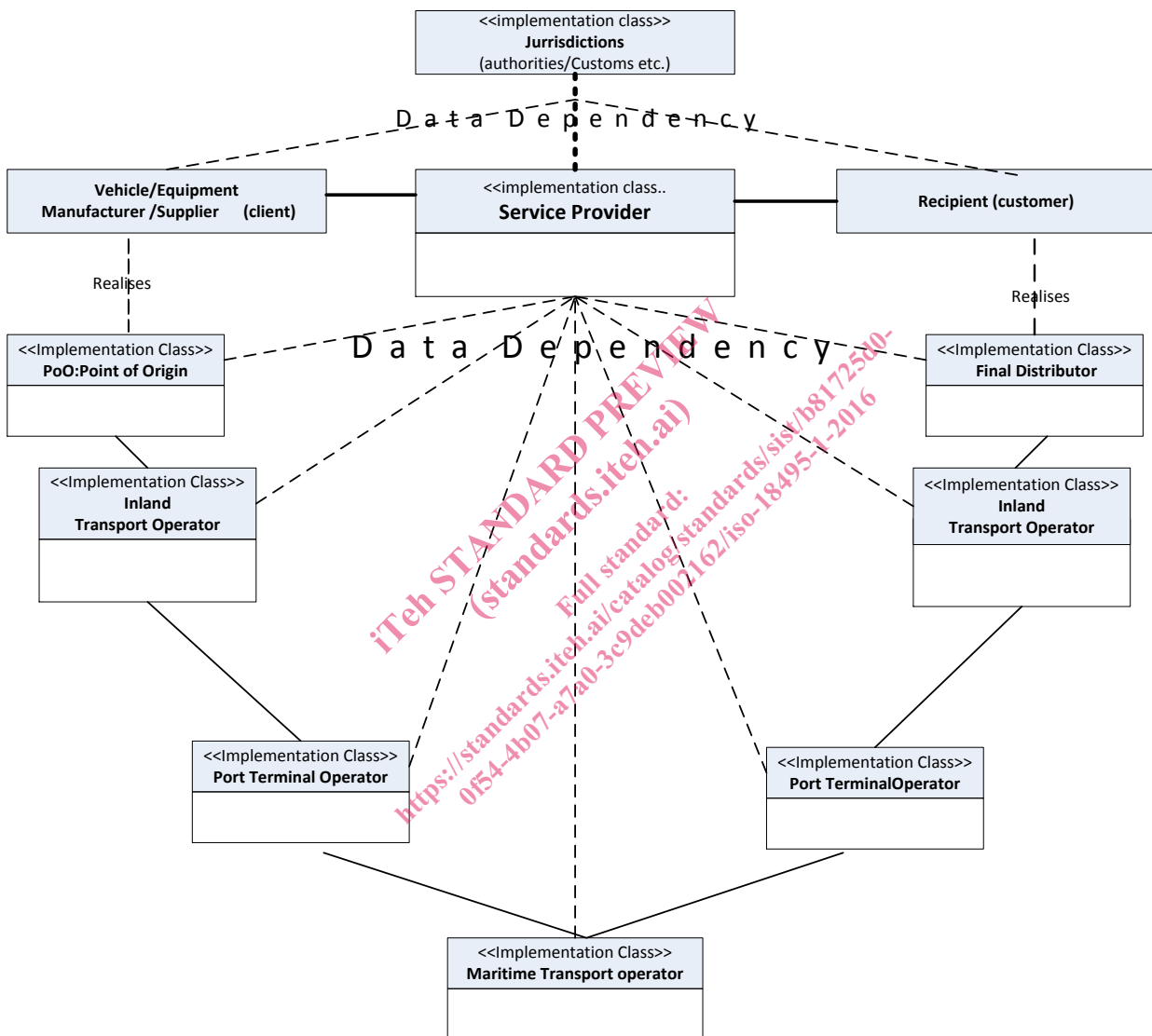

Figure 1: UML high level view of international automotive distribution actors and their data dependency

6.2 Business process overview

6.2.1 Distribution supply chains liable to 'informal' movements of automotives

Vehicle [4.14] and self-powered construction and agricultural machinery manufacture (*automotive* [4.2] production) is a global business. Specific models of *vehicles* [4.14] are made at one or more assembly plants, then shipped to customers in all countries of the world. An *automotive* [4.2] manufacturer of one

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