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Intelligent transport systems — Electronic information exchange to facilitate the movement of freight and its intermodal transfer —

Part 2: Common reporting system

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems.*

This first edition cancels and replaces the first edition (ISO/TS 24533:2012), which has been technically revised.

The main changes are as follows:

— removal of information on the interoperability of freight data exchange standards (intended to be the subject of ISO/AWI 24533-1:—[1]);

— inclusion of information on a common reporting system allowing industry and government to communicate on freight data requirements and needs in an interoperable manner.

A list of all parts in the ISO 24533 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

1) Under development. Stage at the time of publication: ISO/AWI 24533-1:2022.

Introduction

The seamless exchange of accurate, complete and timely data communication at transportation hand-offs has always been important for efficiency and accountability. Hand-offs with a universal method of exchange that allows data interoperability between all parties in the supply chain is critically important for maximizing efficiency and accountability. The efficient exchange of data also provides for security of transport information and for transfer of information related to security against terrorism as well as theft and traditional contraband. It is imperative for standards development organizations to address and facilitate the handling of these needs.

Consequently, Technical Committee ISO/TC 204, *Intelligent transport systems*, seeks to fill a role focusing on data exchange needs for the international supply chain, relating specifically to haulier transportation. This includes data needs for the interface with all modes of transportation, since freight movement normally includes interfaces with other modes of transportation. Those needs are essential for transport information and control systems. Additionally, the need for a standard method of interoperability between data exchange standards is critical for seamless movement within and between modes of transportation, the businesses those modes represent and the authorities requiring specific regulatory information. Some international shipments are carried out entirely by road conveyances, but most begin and end with haulier service and travel by other modes during the shipment. This document focuses on haulier transport interfaces through the supply chain, or those data items that deal specifically with the key transport information critical for getting the goods to the marketplace without delays related to data sharing.

The data structure and formats of interfacing modes need to accommodate each other to ensure efficiency and security from end to end. Truck, rail, air and ocean transport are vital components of intermodal, international shipping. It is recognized that a robust intermodal standard needs to include interface connections to these modes; this has been proven through demonstration tests. Research and tests carried out in the US motivated the use of a truck-air-truck supply chain, for example.

Preliminary investigations suggest that there is no single organization responsible for transport data standards through the intermodal supply chain. To achieve a coherent set of transport standards requires coordination among the various international organizations working on component parts of these international standards.

The vision expressed in this document is to allow electronic data sharing through many-to-many relationships between supply chain partners which can help ensure sustaining legacy standards as needed. This includes B2B (business to business) relationships as well as B2G (business to government) relationships, G2G (government to government) relationships, and G2B (government to business) relationships. Government relationships are also known as administrative relationships. One-to-one relationships require only two partners to have standard data relationships with each other and can require other partners to adopt the standards of the original two. Alternatively, they can require third-party translators, which increases costs in the transport of goods. Relationships that allow all parties in the supply chain to share data equally, for business as well as regulatory purposes, is the focus of this document.

This document builds on ISO 24533-1:—[2)], which focuses on road transport information exchange methodology and interoperability. ISO 24533-2 (this document) is designed to help implement the transport features of ISO/IEC 19845, but it lacks the details of a common reporting system like the single window (SW, a trade facilitation concept including standardized information elements, operating nation by nation) or the common reporting system (CRS).

The common reporting system (CRS) was initially developed as one of the European Union's freight demonstration projects under E-Freight. As such it only had applicability to the EU Member States. Under this document it provides a single, 'standardized' data model for reporting to authorities in compliance with international regulations across all transport modes. It was designed from first principles and therefore does not inherit the inefficiencies of transferring paper systems or mode-specific practices to an electronic system and has no modal or sectoral biases.

2) Under development. Stage at the time of publication: ISO/AWI 24533-1:2022.

Intelligent transport systems — Electronic information exchange to facilitate the movement of freight and its intermodal transfer —

Part 2: Common reporting system

1 Scope

This document specifies the data communication concepts applicable to the data requirements of the transport community. It also includes the regulatory authorities related to freight and its intermodal transfer to participate in common reporting.

Data communication concepts include information entities (data elements), aggregated/associated information entities (groups of data elements) and messages that comprise information exchanges at transport interfaces along the chain of participants responsible for the delivery of goods from the point of origin through to the final recipient. This includes all transport entities carrying the cargo as well as the documents and information required to facilitate the cargo movement.

This document focuses on a single "thread" of the overall end-to-end supply chain. It includes motor transport data needs within the international supply chain to satisfy the requirements of both businesses and governmental organizations on business to business (B2B), business to government (B2G), government to business (G2B) and government to government (G2G) relationships. This document is applicable to shipments that originate in one country and terminate in another. It can also be applied to shipments that originate and terminate in a single country. This document is applicable to freight movements that interface with other modes and incorporates interface requirements set for those other modes.

This document is also designed to incorporate the elements of the Govcbr message (a message developed by the World Customs organization, WCO, that can facilitate data exchange but can potentially not apply to all parties throughout the supply chain) and have them apply across the whole supply-chain, on a global basis.

This document does not constrain the requirements of customs, regulatory and safety bodies at border crossings but does include the data elements likely to be required by customs authorities and other governmental bodies within a single window environment or within a port community system environment.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
access point
business document exchange through intermediary gateway services

3.2
administration to administration
A2A
G2G
information exchange pattern in which an administration (i.e. governance body) wishes to communicate with another administration

Note 1 to entry: This is also known as “authority to authority” (A2A) or "government to government" (G2G).

3.3
administration to business
A2B
G2B
information exchange pattern in which an administration (i.e. governance body) wishes to communicate with a business (i.e. economic operator)

Note 1 to entry: This is also known as “authority to business” (A2B) or G2B "government to business" (G2B).

3.4
agent
name and address of a person or organization authorized to act for or on behalf of another party

3.5
air carrier
carrier using aircraft to transport goods

3.6
authority
statutory body existing within a jurisdiction and a specific area of responsibility that administers legislation to regulate trade and/or monitors compliance with existing legislation

3.7
business to business
B2B
information exchange pattern in which a business (i.e. economic operator) wishes to communicate with another business

3.8
business to administration
B2A
B2G
information exchange pattern in which a business (i.e. economic operator) wishes to communicate with an administration (i.e. governance body)

Note 1 to entry: This is also known as “business to authority” (B2A) or "business to government" (B2G).

3.9
buyer
customer
ultimate consignee
individual or entity purchasing goods or services

3.10
carrier
person or organization that owns and/or operates a transport means engaged in the transportation of passengers or property by land, rail, air or water

3.11
childconsignment
one of the consignments within a consolidated consignment

3.12
common reporting system
CRS
single, standardized document which contains data fields for all the information which is required for reporting to authorities or non-government organizations across all modes and in all Member States

3.13
common intermodal transport framework
CITF
decision support framework for intermodal transport policy

Note 1 to entry: See Reference [63].

3.14
conformance
adherence of a candidate's implementation to a standard

3.15
consignee
receiver
person or company to whom goods are shipped

3.16
consignment
separately identifiable number of goods items (available to be) transported from one consignor to one consignee via one or more modes of transport and specified in one single transport document

3.17
consignor
shipper
party which, by contract with a carrier, consigns or sends goods with the carrier, or has them conveyed by the carrier

3.18
consolidated shipment
the result of combining less than full load shipments from various shippers into one full transport unit (container)

3.19
consolidation
service of consolidating multiple consignments into one shipment

[SOURCE: United Nations, Special Service Description Code, definition 7161 Code ADC][64]

3.20
container
receptacle for the transport of goods, especially one readily transferable from one form of transport to another

Note 1 to entry: This can also include crates and pallets.

3.21
customs
government organization dealing with the levying of duties and taxes on imported goods from foreign countries and the control over the export and import of goods

Note 1 to entry: See Reference [59].

3.22
delivery terms
class for describing the terms and conditions applying to the delivery of goods

3.23
freight forwarder
party arranging the carriage of goods, including connected services and/or associated formalities, on behalf of a consignor or consignee

3.24
governance
system by which organizations are directed and controlled

3.25
Govcbr
message, developed by WCO, incorporating information on goods, cargo, transport equipment, conveyance and crew that is legally required for cross-border transactions to be sent to cross-border regulatory agencies, allowing these agencies to respond to a declaration

Note 1 to entry: It can also be used for sending this information from one cross-border regulatory agency to another.

3.26
intermediary
commercial party who provides services to customers, suppliers or authorities within the supply chain

Note 1 to entry: This includes, but is not limited to, freight transport.

3.27
intermodal transport
movement of goods in one and the same loading unit (e.g. intermodal container) or vehicle which uses successively several modes of transport without handling of the goods themselves when changing modes

3.28
intermodal freight
movement of cargo containers interchangeably between transport modes (i.e., motor, rail, water and air carriers) and where equipment is compatible within multiple systems

3.29
journey
physical movement of goods from the supplier to the consignee

3.30
manifest
document which specifies all cargo on board the transportation unit

Note 1 to entry: The manifest contains details of contents, shipper, consignee and other details that can potentially be required by customs or consular authorities. Copies of manifests are provided for the country of export and country of import customs authorities.

3.31
haulier
carrier using for-hire or private motorized transport on roads to transport goods

3.32
multimodal transport
carriage of goods by at least two different modes of transport

Note 1 to entry: In contrast, intermodal transport implies the change from one mode to another using the same form of loading unit. Multimodal transport implies that either there is more than one modal shift, or that loads may be broken into partial loads as part of a modal change.

[SOURCE: ISO 17261:2012, 3.33]

3.33
OASIS
not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society

3.34
seller
name and address of party selling merchandise to a buyer

3.35
shipment
identifiable collection of one or more goods items, available to be transported together from the original shipper to the ultimate consignee

Note 1 to entry: More than one shipment can be combined into one consignment.

3.36
shipment stage
stage containing information about the transport leg(s) (locations, timings, etc.) and associated non-goods related information, such as crew and passenger lists

Note 1 to entry: There are mainly three shipment stages; during main carriage, during pre-carriage, and during on-carriage.

3.37
single window
facility that allows parties involved in trade and transport to lodge standardized information and documents with a single-entry point to fulfil all import, export and transit related-related regulatory requirements

3.38
original consignor
party that provides goods

Note 1 to entry: This also can be the same entity as the consignor/shipper. The supply chain physically begins with the supplier.

3.39
tracing
function of retrieving status information concerning goods, goods items, consignments or equipment

3.40
transport means
vehicle used for the transport of goods

EXAMPLE A vessel, train or truck.

3.41
transport equipment seal
mechanical or electronic device applied to a container, unit load device, trailer, etc. to guarantee authenticity or security

3.42
Universal Business Language
UBL
OASIS committee with the aim of defining a common XML library of business documents and information elements for transport and procurement

3.43
waybill
non-negotiable document evidencing the contract for the transport of cargo

[SOURCE: UN/EDIFACT, 1001 Document name code, definition 700][62]

4 Symbols and abbreviated terms

ABIE	aggregate business information entity
BBIE	basic business information entity
BCC	basic core component
BIE	business information entity
BII	business interoperability interface
BPAWG	business process analysis working group
CC	core component
CCTS	core component technical specification
CEN	European Committee for Standardization
EAP	electronic access points
ebXML	electronic business extensible markup language
EDI	electronic data interchange
EFM	electronic freight management
FSI	freight services integrator
GII	goods item itinerary
GPS	global positioning system
IMO FAL	International Maritime Organization's Convention on Facilitation of International Maritime Traffic (IMO FAL Convention)
INF	irradiated nuclear fuel
ISSC	international ship security certificate
LSC	logistic service client
LSP	logistics services provider
MWB	multimodal eWaybill
NDR	naming and design rules
NSW	national single window
OECD	organization of economic cooperation and development
PEPPOL	Pan-European Public Procurement Online

SME	small and medium enterprises
SSP	ship security plan
TEP	transport execution plan
TNM	transport network manager
TPS	transport progress status
TR	transport regulator
TS	transportation status
TSD	transport service description
UML	unified modelling language
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNECE	United Nations Economic Commission for Europe
UN/LOCODE	United Nations Code for Trade and Transport Locations
UNTDED	United Nations Trade Data Element Directory
URI	uniform resource identifier
URL	uniform resource locator
WCO	World Customs Organization

5 Intermodal freight context

5.1 General

This document addresses an interoperable methodology for using standard messages and tools that will maximize the efficiencies for transporting goods from a seller (or "original consignor") to a buyer (or "original consignee"), using intermodal transport that includes haulier, marine, air and rail links, while satisfying governmental regulatory requirements. It is appropriate for supporting operational freight movements that occur worldwide, whether that freight travels from point of origin to destination domestically or internationally. While this document is not focused on unimodal movements, and any unique requirements therein, it is considered complementary to standards of unimodal freight movement. The intent is to allow data to move securely and freely between all entities that need the freight information in connection with their areas of responsibility whether for non-governmental purposes or for governmental purposes.

This document includes surface transport data needs as well as all modes connecting with surface transportation within the international supply chain to satisfy the requirements of both businesses and governmental organizations, on B2B, B2G, G2G as well as G2B relationships. It may also be applied to consignments that originate and terminate in a single country. This document is applicable to freight movements that interface with other modes and incorporates requirements set for those other modes.

5.2 Intermodal vs. multimodal relationship

The terms "intermodal" and "multimodal" can be confusing when discussing freight that moves between more than one mode to reach its destination. Figure 1 shows the difference between those terms while incorporating the concept of interoperability.

As defined in this document, intermodal freight transport consists of the intermodal movement of goods in one and the same loading unit (e.g. intermodal transport equipment) or vehicle which uses several modes of transport successively without handling the goods themselves when changing modes, and it may involve several contracts of carriage. Transport modes include motor, rail, water, and air carriers.

On the other hand, multimodal transport consists of the carriage of goods by at least two different modes of transport. Multimodal transport implies that either there is more than one modal shift or that loads are broken into partial loads as part of a modal change. In multimodal transport there is one contract.

Since multimodal movements use one contract, interoperability is not as critical in those situations since there is no need for data sharing from origin to destination. However, intermodal movements involve several contracts and many different parties engaged with the movement of freight. Therefore, data transfer becomes more prevalent and the need for data streamlining becomes more important to avoid any disruption in the movement of the freight.

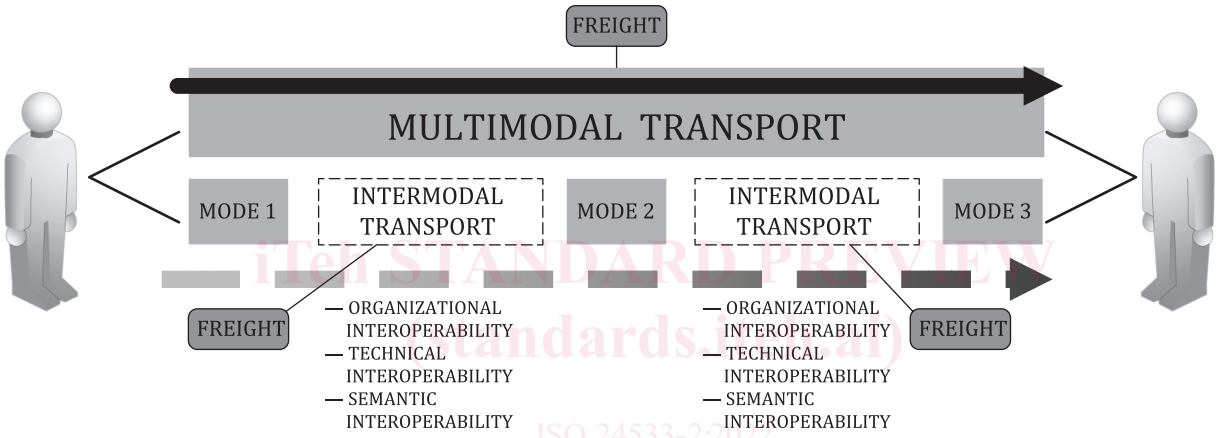

Figure 1 — Intermodal/multimodal relationships

Organizational interoperability is about being able to identify the players and organizational processes involved in the delivery of a specific eGovernment service and achieving agreement among them on how to structure their interactions, i.e. defining their “business interfaces”.

Technical interoperability is about knitting together IT systems and software, defining, and using open interfaces, standards and protocols in order to build reliable, effective and efficient information systems.

Semantic interoperability is about ensuring that the meaning of the information exchanged is not lost in the process, that it is retained and understood by the people, application and institutions involved.

5.3 Common intermodal transport framework

The common intermodal transport framework (CITF) is designed to facilitate improved interoperability between the information systems used by all stakeholders in transport and logistics. It was developed as part of ISO/IEC 19845.

Since the stakeholders have been divided into a set of roles, the CITF defines the information within "electronic documents" that need to be exchanged between the roles such that each one is able to perform the functions associated with the roles as efficiently and effectively as possible. These documents (as well as business processes involved in their exchange) were developed based on requirements collected from freight industry actors in the European projects Freightwise, e-Freight and iCargo primarily, but also receiving requirements and other input from associated European projects and a US project called Electronic Freight Management (EFM). All are related to improving freight management operations.

The standardization process started in 2008 through cooperation with the technical committee in OASIS that was developing version 2.1 of Universal Business Language (UBL). Much work was involved in adapting the ideas of the CITF to the principles of UBL and to provide the required backwards compatibility. Eventually key elements of the CITF became part of the official version of UBL 2.1. After making UBL 2.1 complete and official, OASIS started a process of having this standard accepted by ISO. This process was completed late 2015, and elements of the Common (e-Freight) Framework are now part of ISO/IEC 19845.

The development of the framework started by defining the roles that were involved in transport and logistics:

— Logistic service client (LSC) = Logistic services buyer — defined as the party ordering the logistics services from the logistic service provider and can be either the consignor or the consignee depending on the business scenario.

— Logistics services provider (LSP) — associated with the logistics supply domain, which responds to the demands from LSCs.

— Transport network manager (TNM) — associated with the transport network management domain and responsible for providing information about availability and status for the transport and logistics infrastructure.

— Transport regulator (TR) — associated with the regulation enforcement domain and responsible for ensuring that transport and logistics operations are being conducted according to the relevant rules and regulations.

The scope for the framework was all transport modes and combinations of modes into multimodal services. It was also realized that the role previously called freight services integrator (FSI) is not a separate role in relation to the ones described in the list above. The FSI characterizes an organization or person that combines the roles of logistics services client and logistics services provider in order to conduct business. From an information exchange point of view, the FSI does not have any special requirements.

The reference model described in Figure 2 illustrates the domains and a minimum set of electronic documents that are required for operators in the different domains to do their jobs effectively.

These electronic documents are:

— Transport service description (TSD)

— Transport execution plan (TEP)

— Goods item itinerary (GII)

— Transportation status (TS)

— Multimodal eWaybill (MWB)

— Transport progress status (TPS)

— Common reporting system (CRS)