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DSCA Data & Interface Standards.

Information Model 2.0

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Preface

DCSA envisions a digitally interconnected container shipping industry. Our mission is to be the de facto standards body for the industry, setting the technological foundation for interoperable IT solutions. Together with our member carriers, DCSA creates vendor-neutral, technology-agnostic standards for IT and non-competitive business practices. By working towards the widespread adoption of these standards, our aim is to move the industry forward in terms of customer experience, efficiency, collaboration, innovation and respect for the environment.

The objective of the DCSA Data and Interface Standard project workstream is to strengthen the container shipping industry's ability to send and receive data across all parties in the industry. Furthermore, it aims at to enhance inter-carrier cooperation based on shared requirements and to ensure interoperability by using a shared data language. Ideally, this language will be inspired by existing standards and aligned with the industry process definitions put forth in the DCSA Industry Blueprint.

The standards published by DCSA are technology agnostic. DCSA does not point to the use of specific vendors' technologies or systems but relies on open-source, shared requirements for the industry that can be used by all parties, regardless of their choice of technology.

This document

The DCSA Information Model has been created to organise and catalogue the information being generated or consumed in connection with the processes described in the DCSA Industry Blueprint. The information model is also used as a collective term to describe all products that model data needed to meet the interface requirements. The information model includes a diagrammatic representation of selected data entities and their relationships with one another.

This document is supported by a range of supplementary publications by the DCSA, which will be referenced in the relevant sections. The supporting publications are:

- **DCSA Glossary of Terms 2.0**
This document promotes alignment of terms across all DCSA stakeholders in the container shipping industry. The glossary was published on the DCSA website in the context of the DCSA Industry Blueprint 2.0.
- **DCSA Industry Blueprint 2.0**
This document provides insights into as-is carrier processes. The DCSA Industry Blueprint comprises processes related to the movement of a container/equipment from one location to another, processes that are linked to a shipment/booking, processes that are considered critical for industry digitisation and standardisation efforts, and finally processes that are not considered commercially sensitive or of competitive advantage.
- **DCSA Event Naming Convention 1.0, and Event Structure Definitions 1.0**
Throughout the years, track and trace solutions have become a commonly seen service in the container shipping industry. However, due to misalignment of terminology and ways of working, each carrier has designed its own events that have been published on the carriers' websites. To align this across the industry, this document provides a naming convention that sets the standard for naming as well as understanding customer-facing track and trace events.
- **DCSA Schedule Definitions 1.0**
This document aims at standardising the terminology and definitions with respect to communication of operational deep-sea (inter-regional) vessel schedules between Vessel Sharing Agreement (VSA) partners. The purpose is to facilitate standardisation and accuracy in partner communication and hence reduce the pain-points that carriers raised in this area. It is understood that not all VSA's (or carriers) apply ALL processes, but for the sake of completeness, the full process definitions are shared with all members. The purpose is to standardise what and when partners communicate (and to whom) with respect to operational vessel schedules and related exception-management. The definitions and time specifications add context to the vessel schedule process maps that have been circulated separately to members.
- **DCSA Information Model 2.0 Reading Guide**
This document helps to set the context for DCSA initiatives. The reading guide provides insight into the different concepts and methods utilised in the production of the Information Model and suggests ways in which the document can be used.
- **DCSA Interface Standard for Operational Vessel Schedule 1.0 and respective Reading Guide**
The DCSA Interface Standard for Operational Vessel Schedule has been created to simplify the exchange of vessel schedule-related information between vessel operators, and to support the standardisation of the fundamental information provided across the vessel operator liner domain. The reading guide provides insight into the different concepts and methods utilised in the production of the OVS Interface Standard and suggests ways in which the document can be used as a foundation for future implementations.
- **DCSA Interface Standard for Track and Trace 1.2 and respective Reading Guide**
The DCSA Interface Standard for Track and Trace 1.2 has been created to standardise the fundamental information provided across the carrier liner domain through track and trace interfaces. The reading guide provides insight into the different concepts and methods utilised in the production of the Track and Trace Interface Standard and suggests ways in which the document can be used as a foundation for future implementations.

Document ID and version history

Name	Description
Document	DCSA Information Model
Date created	2020-02-13
Last updated date	2020-07-03
Document author	Digital Container Shipping Association (DCSA)
Version 1.0	First publication based on the track and trace business requirements
Version 2.0	Second publication to also address the operational vessel schedule domain

Table 1. Document information

Referenced documents

- DCSA Glossary of Terms 2.0
- DCSA Industry Blueprint 2.0
- DCSA Event Naming Convention 1.0 and Event Structure Definitions 1.0
- DCSA Schedule Definitions 1.0
- DCSA Information Model 2.0 Reading Guide
- DCSA Interface Standard for Operational Vessel Schedule 1.0 and respective Reading Guide
- DCSA Interface Standard for Track and Trace 1.2 and respective Reading Guide

The above-mentioned documents can be found on [DCSA.org website](https://dcsa.org).

1 Introduction

1.1 Objective

The DCSA Information Model 2.0 has been created to provide a holistic overview of the information agreed upon as part of the process standards defined in the DCSA Industry Blueprint 2.0 and in line with the definitions documented in the DCSA Glossary of Terms 2.0.

By standardising the terms used and documenting the related data, the DCSA Information Model aims to provide a foundation that can be used in the current interface standardisation work and for future initiatives. DCSA recognises that there is a variety of standards that exist today and endeavours to reuse these resources where appropriate within the context of the container shipping industry. Some of these existing standards are more widely adopted than others, such as the UN/CEFACT Multimodal Transport Reference Data Model (MMT RDM). It is the intention of DCSA to constantly evaluate the DCSA Information Model against this and other standards.

1.2 Overview

The DCSA Information Model has been designed to act as a translator between the information requirements identified by the business processes mapped in the DCSA Industry Blueprint and the existing standards for describing reference data relevant to the industry. This helps identify what is already available and where any potential gaps exist that need further investigation. This is depicted in Figure 1 along with how the DCSA Information Model interacts with the different elements.

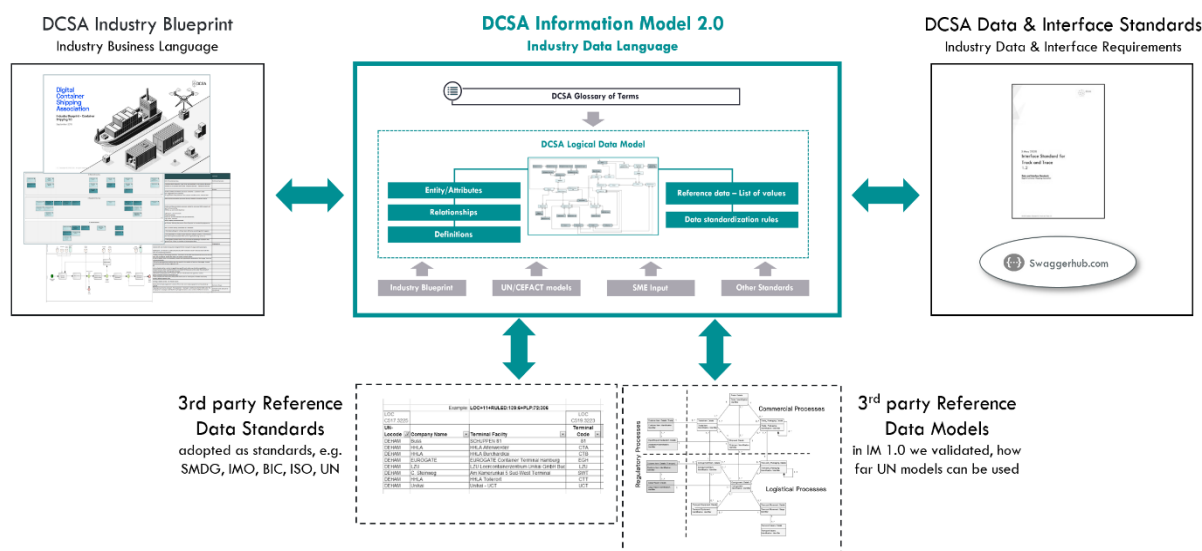


Figure 1. The DCSA Information Model as a translator

1.3 Conformance

All parties in the container shipping industry are encouraged to implement and follow the data and interface requirements outlined and specified in this document. The requirements are linked to the UML version 2.0 diagrams for design requirements as well as the Logical Data Model and data definitions for information requirements, which must be implemented in order to conform to the agreed standards within the DCSA framework.

1.4 Normative references

The documents listed below constitute the normative references for publication 2.0 of the DCSA Information Model:

- DCSA Industry Blueprint
- DCSA Glossary of Terms
- DCSA Information Model Reading Guide
- DCSA Interface for Operational Vessel Schedule
- DCSA Interface for Operational Vessel Schedule Reading Guide
- DCSA Interface for Track and Trace
- DCSA Interface for Track and Trace Reading Guide
- DCSA Event Naming Convention
- DCSA Event Structure Definitions

2 DCSA Information Model 2.0

2.1 Introduction

The DCSA Information Model 2.0 refers to the collection of artefacts and products that document and define the reviewed and agreed data standards that must be followed within the DCSA framework. The adoption of the industry standards in the DCSA Information Model 2.0 will help ensure the ongoing standardisation and optimisation of interoperability and data exchange between the parties in the container shipping industry as well as other stakeholders working within the industry.

As depicted in the diagram below (Figure 2), the DCSA Information Model 2.0 consists of the following artefacts and products:

- **Logical data model:** A diagrammatic representation of:
 - Data entities and the data attributes that store details about the entities
 - The relationships that exist between data entities
 - Standardised names of data entities and data attributes, for example, *equipment* versus *container*; definitions of the entities and attributes are stored as part of the metadata for the model.
- **Standardised lists of data:** This is particularly relevant for reference data entities, through which a controlled list of values is recommended to help ensure that the same data are being used within and between organisations.
- **Data standardisation rules:** When a predetermined data value cannot be offered, the data standardisation rules can help with the generation of consistent data values that can be used.

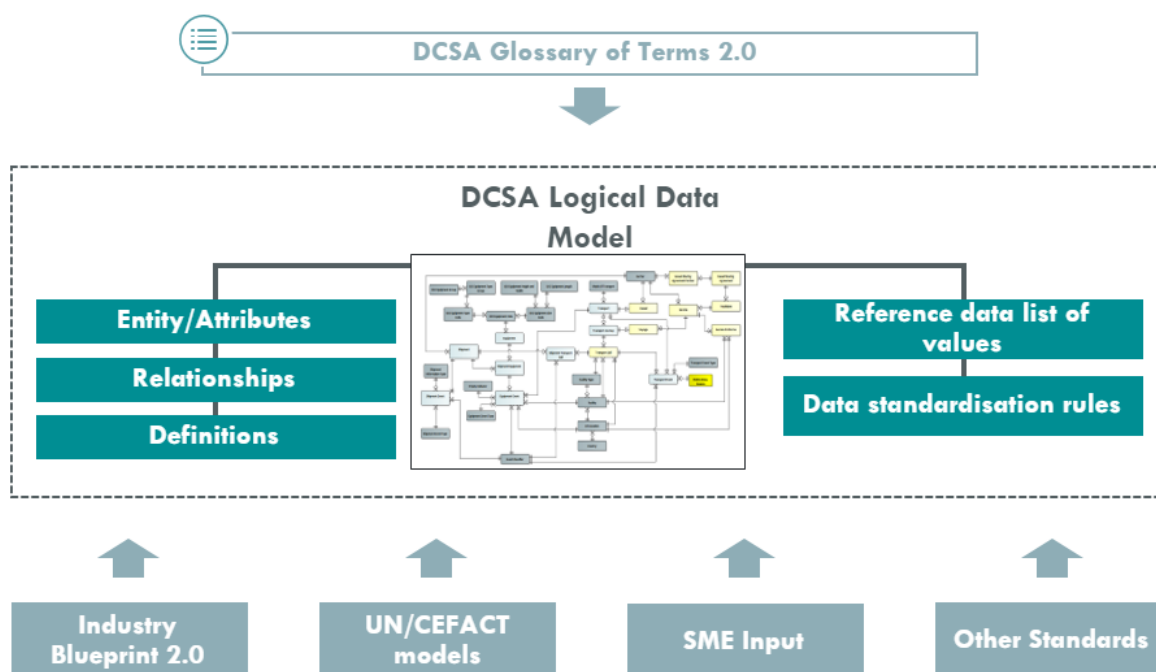


Figure 2. Overview of the contents of the DCSA Information Model

The DCSA Information Model 2.0 has been designed to support a shared understanding of concepts, terms, and rules within the shipping industry. The principles behind the creation of the model have been to look to the current standards used within the industry and to reuse these standards where appropriate, or, propose new ones where a usable standard could not be found. The key input for the DCSA Information Model 2.0 includes:

- **DCSA Industry Blueprint 2.0:** comprises recommended current-state standards for the processes used in container shipping. The terminology used in the Information Model has primarily been aligned with the DCSA Industry Blueprint terminology.
- **DCSA Glossary of Terms 2.0:** Definitions of terms used across the DCSA in an industry-specific language.
- **UN/CEFACT models:** The Multimodal Transport (MMT) Reference Data Model (RDM) has been used as a key resource to help define and standardise entities within the Logical Data Model.
- **SME input:** Input from the appointed subject matter experts (SMEs) among the DCSA members.
- **Other Standards:** The DCSA regularly checks which other relevant standards are being used and where possible, will re-use proven standards. An example is the ISO standard 3166 for defining country codes.

As the model deals with industry data at logical and conceptual levels rather than applying physical naming conventions configured in, for example, physical databases, the DCSA Information Model must be considered the container shipping industry's reference data model, helping the users of the model to understand how data are generated/consumed as a result of the execution of industry processes and how these data can be mapped in a logical way.

2.2 Selected data modelling terms defined

The table below provides a definition of selected terms used throughout this document and provides the reader with insight into the meaning of the term and the origin of the definition. Specific terms and definitions that are indispensable for this document may include alternative or reproduced definitions from existing standards, or they may be referenced as a shared understanding within the DCSA.

Term	Definition
Data Entity	An object in a data model (e.g. in The Logical Data Model, <i>Equipment</i> is a data entity).
Information Model	The information model refers to a collection of artefacts and products that help define the information that is relevant to the container shipping industry.
Logical Data Model	A graphical way of representing data architecture without any regard to the physical implementation or the database management system technology involved in storing the data, providing information about the various entities, and the relationships between the entities.
Reference Data	Reference data is data that defines the set of permissible values to be used by the data entities. Reference data is typically a class of data commonly referred to as code tables or look-up tables generally consisting of three attributes: a code, a name and a description. Reference data may be described as any kind of data that is used to categorise other data.

Table 2. Selected data modelling terms

2.3 The DCSA Information Model data types and formats

For each data attribute, which the Logical Data Model points to, a particular data type has been selected to provide additional details that have already been identified. An overview of the different data types utilised is presented in Table 3. When the data type is selected, the reasoning below is applicable throughout this document.

Data type	Usage rule
Text	The Text data type stores strings in a variable-length field. Data can consist of letters, numbers, and symbols. In cases where there is a maximum number of characters allowed, this will be stated by capturing the maximum numbers of characters allowed, in brackets, e.g. Text(100) is used when the length of the data field can vary, up to a maximum of 100 characters.
Number	The Number data type represents a number, potentially decimal, i.e. with digits after the decimal point.
DateTime	A DateTime is only meaningful in relation to a specific location. The DateTime attribute should always be specified as UTC or with a UTC Offset to provide context as to which time zone (location) the DateTime relates to. If no UTC-related offset is given, the time is assumed to be in local time. However, this might result in ambiguity and confusion when used across time zones or even within the same time zone if the region observes daylight saving time (DST). If the time is provided in UTC, append a Z directly after the time. Z (also "Zulu" time zone) is the zone designator for UTC±00:00: 'YYYY-MM-DDThh:mm:ssZ'. Negative UTC offsets describe a time zone west of UTC±00:00, where the time is behind UTC. For example, Quito is five hours behind UTC so the time zone designator is "-05:00". The DateTime '2019-12-31T12:00:00-05:00' and '2019-12-31T17:00:00Z' describe the same point in time in Quito. Positive UTC offsets describe a time zone east of UTC±00:00, where the time is ahead of UTC. For example, Luanda is one hour ahead of UTC so the time zone designator is "+01:00". The DateTime '2019-12-31T12:00:00+01:00' and '2019-12-31T11:00:00Z' describe the same point in time in Luanda. The plus sign must be used for a positive or zero UTC offset, and a minus sign for a negative UTC offset. Hence the UTC offset -00:00 is not permitted. For London, the time zone designator would be +00:00 (not -00:00), and +01:00 during daylight saving time. DateTime format without UTC-related offset (local time): 'YYYY-MM-DDThh:mm:ss'. DateTime format with UTC Offset: 'YYYY-MM-DDThh:mm:ss±hh:mm'. DateTime format in UTC: 'YYYY-MM-DDThh:mm:ssZ'.

Table 3. Data type overview

Attribute naming conventions

To maintain consistency in the Logical Data Model, certain labels are used repeatedly to make the meaning of these attributes a bit clearer.

As a general rule, for entities that hold reference data, the following suffixes will be used:

- Code
- Name
- Description

Table 4 below shows a selection of the labels that certain types of attributes use consistently.

Format	Format usage rule
Code	(For reference data entities) A business code used to uniquely identify each row. These codes may be recognisable by the business community and therefore have a business meaning.
Name	(For reference data entities) A short description of what the reference data value is; this is the value that will usually be used in reporting.
Description	(For reference data entities) In cases where an addition explanation may be beneficial, a description may be included.
ID	An internal DCSA identifier used to make the model easier to understand and preserve relationships. These are not real-world business keys and are not intended to be referenced by the interface standards.
DateTime	In the current version of the model, the DateTime suffix and data type is used to denote instances where only a date needs to be captured and also where both the date and the time needs to be captured. This is to allow for flexibility, given the variances in how data may be stored by different organisations. If only the date is captured, the time part will consist of zeros for HH:MM:SS (00:00:00). Note: A UTC-related offset should not be specified because these are only meaningful in combination with a time. The date is assumed to be local in relation to the location the date is referring to.

Table 4. Data attribute naming conventions

3 Logical Data Model

The Logical Data Model of the DCSA Information Model 2.0 is presented at an entity level in Figure 3 below.

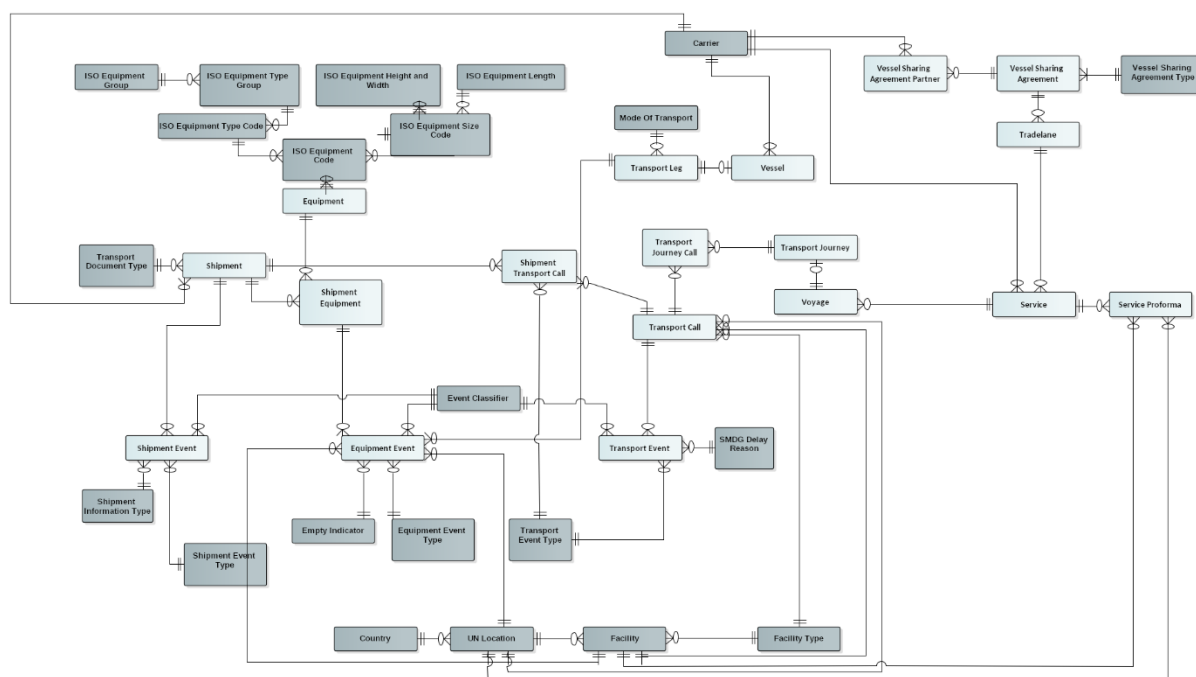


Figure 3. The Logical Data Model: Overview of data entities

The entities in the Logical Data Model can be split into the following two categories:

- 1) Entities (light grey)
- 2) Reference data entities (dark grey).

The Logical Data Model details the entities and their relationships with one another. An entity is an object that can have information stored about it, for example, Shipment, Equipment, and Transport. A relation describes the industry data-related rules between two entities.

In many cases, entity data is generated as unique transactional records, for example, a booking whose data cannot be predetermined in the same way that reference data can. However, it is important for DCSA to point to specific formats or conventions that can be followed to avoid duplicated information (for example, two unique instances of equipment with the same reference number) or incompatible data formats (for example, conflicting date formats such as 2 March 2010 written as 02/03/2010 versus 2010-03-02). Regarding reference data, a holistic dataset (list of values) will be described to ensure that the data is accurate and will yield the same results no matter who uses them. Within each subject area in the subsequent sections, the reference data, which DCSA recommends, will be cited. In cases where a standard already exists, and it has been agreed within DCSA to utilise the standard, it will be referenced; otherwise it will be specified where a new dataset is created.

In general, the Logical Data Model is a work-in-progress model, limited in size by the scope of each release. Therefore, the model will transform and grow over time and, for example, cover more breadth per relevant subject area in subsequent releases.

4 Subject areas in the Logical Data Model

The Logical Data Model is split into subject areas to provide a more focused overview of each part of the model, as illustrated in Figure 4. Each subject area consists of one or more data entities and the related reference data.

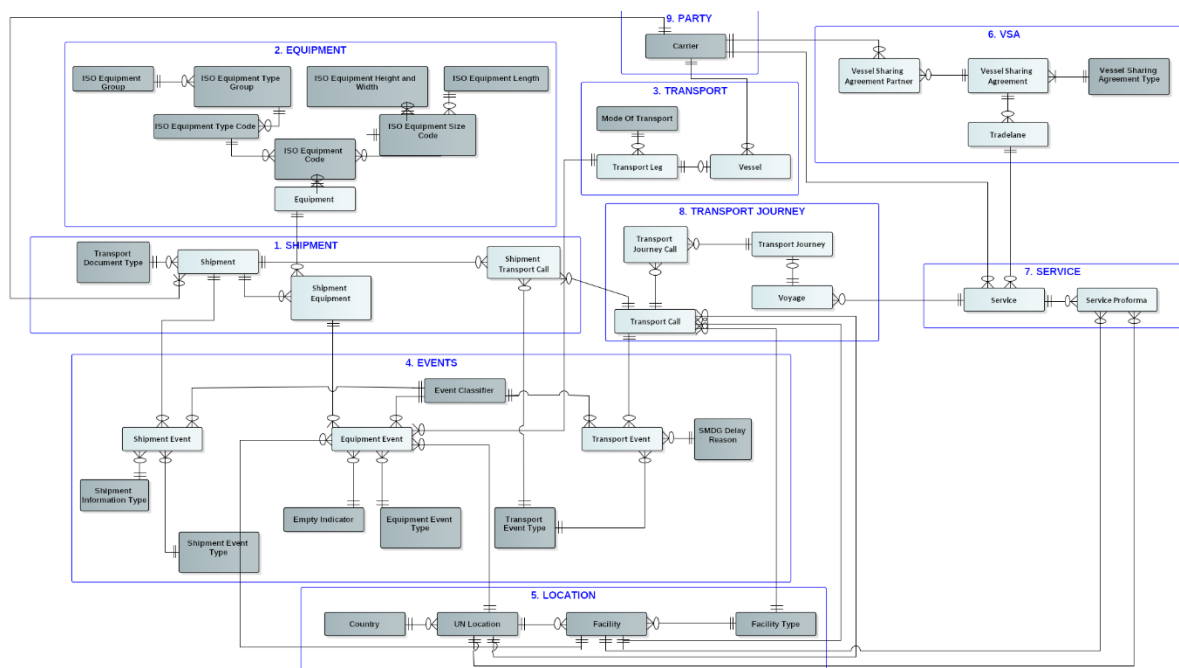


Figure 4. Subject areas in the Logical Data Model

In the following sections, each of the subject areas and their relating data entities and data attributes will be described in the following order:

- 1) Shipment
- 2) Equipment
- 3) Transport
- 4) Events
- 5) Location
- 6) Vessel Sharing Agreement (VSA)
- 7) Service
- 8) Transport Journey
- 9) Party

Within each subject area, an overview of and insight into the reference data values are provided. Where an existing reference data standard is reused, the source will be stated. Otherwise, an alternative will be specified. All reference data entities will be described in relation to the subject areas that they are part of.

4.1 Shipment

The subject area of Shipment contains three entities: Shipment, Shipment Equipment and Shipment Transport Call. The term shipment has been defined in accordance with the DCSA Industry Blueprint 2.0. Other organisations may refer to a Consignment in a similar context as DCSA uses the term Shipment, as the preferred term in the container shipping industry. For example, the UN/CEFACT MMT reference data model defines a *shipment* and a *consignment* as distinct, but related, entities.

The Shipment subject area and its entities will allow for the identification of the shipment that a user may want to track, along with all of the instances of Equipment that have been used to fulfil the shipment and all of the locations that are called at, by the specific instances of transport involved in the delivery of that shipment. The Shipment entity is shown in Figure 5, and all shipments will be stored in this entity. The relationship between the Shipment entity and the relevant parties is that a shipment must be assigned to one and only one carrier (as defined by the Carrier Code), and in addition, a consignee and a shipper may be captured as optional text (the shipper and the consignee can be the same unit/individual).

This version of the information model assumes that a Shipment is uniquely identified by the carrier-specific booking reference, and thus, is unique per carrier only. The current model works with the limited scope of a 1:1 relationship between shipment and bill of lading.

The Shipment Event entity is linked to the Shipment entity to gather the events related to the shipment. This is documented in the Event subject area, in a later section of this document.

The relationship between each shipment and an equipment is held in the Shipment Equipment entity. The details of all of the different locations where the instances of transport involved in the shipment called at, is held in the Shipment Transport Call entity.

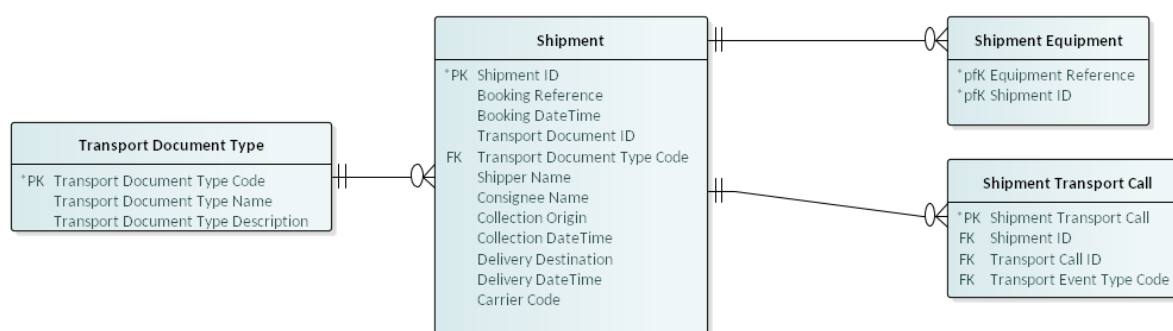


Figure 5. Shipment subject area

The entities within the Shipment subject area are defined and detailed in in Table 5, Table 6, Table 7 and Table 8.

Entity: Shipment		
A shipment is the realisation of a customer booking for which all containers have a common routing and details of scheduling.		
Attribute	Definition	Data type
Shipment ID	The unique identifier for a shipment. The uniqueness of each row is based on: - Booking Reference - Carrier Code	Number
Booking Reference	The identifier for a shipment, which is issued by and unique within each of the carriers.	Text(35)
Booking DateTime	The date and time of the booking request.	DateTime
Transport Document ID	The Transport Document ID is an identifier that links to a shipment, i.e. a Bill of Lading or a Sea Waybill	Text(20)
Transport Document Type Code	The type of the transport document (i.e. a Bill of Lading or a Sea Waybill)	Text(20)
Shipper Name	The name of the shipper, who requested the booking.	Text(50)
Consignee Name	The name of the consignee.	Text(50)
Collection Origin	The location through which the shipment originates. It can be defined as a UN Location Code value or an address. The customer (shipper) needs to place a booking in order to ship the cargo (commodity) from an origin to destination. This attribute specifies the location of the origin.	Text(250)
Collection DateTime	The date and the time that the shipment items need to be collected from the origin.	DateTime
Delivery Destination	The location to which the shipment is destined. It can be defined as a UN Location Code value or an address. The customer (shipper) needs to place a booking in order to ship the cargo (commodity) from an origin to destination. This attribute specifies the location of the destination. Also known as 'place of carrier delivery'.	Text(250)
Delivery DateTime	The date and, when possible, time that the shipment items need to be delivered to the destination.	DateTime
Carrier Code	Identifies the carrier who is responsible for the shipment	Text(10)

Table 5. Shipment entity

Entity: Shipment Equipment		
A shipment may be fulfilled using part or all of an equipment, or may be transported using multiple pieces of equipment. This entity captures how the shipment will be fulfilled/split using one or more pieces of equipment.		
Attribute	Definition	Data type
Shipment ID	Identifies the shipment which is being fulfilled	Number
Equipment Reference	Identifies the equipment involved in the shipment	Text(15)

Table 6. Shipment Equipment entity

Entity: Shipment Transport Call		
A list of all Transport Calls that have been involved in order to complete a shipment. This will include planned calls that may be changed at a later stage and also additional calls that were not originally planned.		

Entity: Shipment Transport Call		
Attribute	Definition	Data type
Shipment Transport Call ID	The unique identifier of a shipment transport call. The uniqueness of each row is based on: • Shipment ID • Transport call ID • Transport Event Type Code	Number
Shipment ID	Identifies the shipment which is being fulfilled	Number
Transport Event Type Code	Specifies whether the transport call is an arrival or a departure	Text(3)
Transport Call ID	Identifies the specific transport call involved	Number

Table 7. Shipment Transport Call entity

Entity: Transport Document Type		
An entity containing the reference data for the different transport document types.		
	Definition	Data type
Transport Document Type Code	The type of the transport document (i.e. a Bill of Lading or a Sea Waybill)	Text(20)
Transport Document Type Name	The full names of the document types (Bill of Lading or Sea Waybill)	Text(20)
Transport Document Type Description	A description of the different document types	Text(200)

Table 8. Transport Document Type

4.1.1 Shipment reference data

Figure 6 shows the reference data entity in the Shipment subject area.



Figure 6. Shipment reference data entity

4.1.1.1 Transport document type

Table 9 contains the transport document type codes and names defined by DCSA.

Transport Document Type Code	Transport Document Type Name	Transport Document Type Description
BOL	Bill of Lading	A Bill of Lading acts as the contract of carriage and receipt of the goods, while also serving as a document of title affording ownership
SWB	Sea Waybill	A Sea Waybill is evidence of a contract of carriage and receipt of the goods being transported

Table 9. Transport Document Type Code

4.2 Equipment

As shown in Figure 7, the equipment subject area is modelled to ensure that a specific equipment can be identified and detailed appropriately in terms of type and size in accordance with ISO 6346:1995 *Freight containers –*

Coding, identification and marking and amendment 3 (2012) to ISO 6346:1995. Whenever ISO 6346:1995 is mentioned as a reference in this document, this includes amendment 3. The entity Equipment stores all instances of equipment that can be used to fulfil a shipment. Each piece of equipment can be categorised according to its type and size, and this information is contained in a hierarchy of reference tables based on ISO 6346. The ISO Equipment Code entity brings together reference data regarding equipment size (via the ISO Equipment Size Code entity) and reference data regarding equipment type (via the ISO Equipment Type entity).

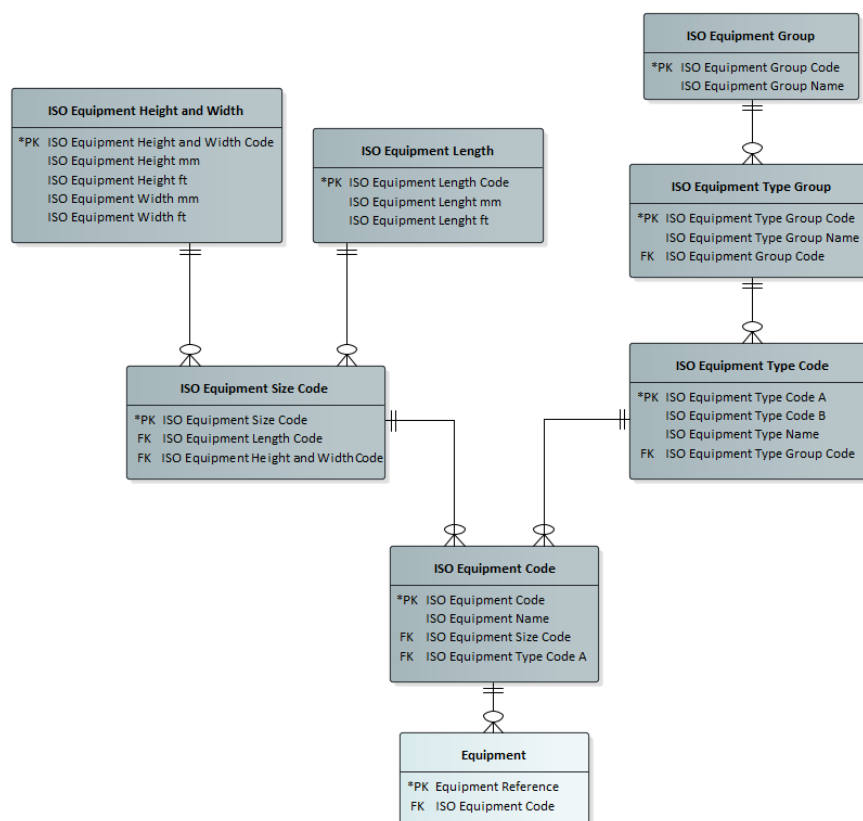


Figure 7. Equipment subject area

The equipment entities within the Equipment subject area are defined and detailed in Table 10, Table 11, Table 12, Table 13, Table 14, Table 15, Table 16 and Table 17.

Entity: Equipment		
Used for storing cargo in/on during transport. The equipment size/type is defined by the ISO 6346 code. The most common equipment size/type is 20'/40'/45' Dry Freight Container, but several different versions exists.		
Attribute	Definition	Data type
Equipment Reference	The unique identifier for the equipment, which should follow the BIC ISO Container Identification Number where possible. According to ISO 6346, a container identification code consists of a 4-letter prefix and a 7-digit number (composed of a 3-letter owner code, a category identifier, a serial number and a check-digit). If a container does not comply with ISO 6346, it is suggested to follow Recommendation #2 "Container with non-ISO identification" from SMDG.	Text(15)
ISO Equipment Code	Unique code for the different equipment size/type used for transporting commodities. The code is a concatenation of ISO Equipment Size Code and ISO Equipment Type Code A and follows the ISO 6346 standard.	Text(4)

Table 10. Equipment entity

Entity: ISO Equipment Length		
Identifies the unique length of a piece of equipment based on ISO standard 6346 terms.		
Attribute	Definition	Data type
ISO Equipment Length Code	ISO first size code character that represents the length of a piece of equipment; follows the ISO 6346 standard.	Text(1)
ISO Equipment Length mm	ISO equipment length in millimetres; follows the ISO 6346 standard.	Text(10)
ISO Equipment Length ft	ISO equipment length in feet and inches; follows the ISO 6346 standard.	Text(10)

Table 11. ISO Equipment Length entity

Entity: ISO Equipment Height and Width		
Identifies the unique height and the width of an equipment in ISO 6346 standard terms.		
Attribute	Definition	Data type
ISO Equipment Height and Width Code	ISO code to uniquely identify the height and width of an equipment; follows the ISO 6346 standard.	Text(1)
ISO Equipment Height mm	ISO equipment height in millimetres; follows the ISO 6346 standard.	Number
ISO Equipment Height ft	ISO equipment height in feet and inches; follows the ISO 6346 standard.	Text(5)
ISO Equipment Width mm	ISO equipment width in millimetres; follows the ISO 6346 standard.	Number
ISO Equipment Width ft	ISO equipment width in feet and inches; follows the ISO 6346 standard.	Text(05)

Table 12. ISO Equipment Height and Width entity

Entity: ISO Equipment Size Code		
Uniquely identifies the length and height/width of a piece of equipment in ISO 6346 standard terms.		
Attribute	Definition	Data type
ISO Equipment Size Code	ISO size code designation; two alphanumeric characters used to designate the size code of a piece of equipment. - The first character represents the length - The second character represents the width and the height The size code follows the ISO 6346 standard.	Text(2)
ISO Equipment Length Code	ISO first size code character that represents the length of a piece of equipment; follows the ISO 6346 standard.	Text(1)
ISO Equipment Height and Width Code	ISO second size code character representing the height and width of a piece of equipment; follows the ISO 6346 standard.	Text(1)

Table 13. ISO Equipment Size Code entity

Entity: ISO Equipment Group		
The highest level of ISO grouping for equipment according to the ISO 6346 standard.		
Attribute	Definition	Data type
ISO Equipment Group Code	A code for the equipment group as defined by the ISO 6346 standard.	Text(1)
ISO Equipment Group Name	A name defined by the ISO 6346 standard that describes the equipment group.	Text(100)

Table 14. ISO Equipment Group entity

Entity: ISO Equipment Type Group		
Entity used to group the different ISO equipment types according to the ISO 6346 standard.		
Attribute	Definition	Data type
ISO Equipment Type Group Code	Unique code for the different type groups defined by the ISO 6346 standard.	Text(2)
ISO Equipment Type Group Name	A name that describes the type group code; follows the ISO 6346 standard.	Text(100)
ISO Equipment Group Code	A code for the equipment group as defined by the ISO 6346 standard.	Text(1)

Table 15. ISO Equipment Type Group entity

Entity: ISO Equipment Type Code		
Identifies all the different types of equipment based on the different sizes, types, and purpose of the equipment, for example <i>20-foot reefer container</i> , and follows the ISO 6346 standard.		
Attribute	Definition	Data type
ISO Equipment Type Code A	Code for the different equipment types used for transporting commodities. For equipment designed and tested with full stacking (minimum superimposed mass of 192,000 kilos) and racking (minimum transverse force of 150 kN) capabilities. Superimposed mass is as defined in ISO 1496-1:1990; The code follows the ISO 6346 standard.	Text(2)
ISO Equipment Type Code B	Code for equipment designed and tested with reduced stacking and/or racking capabilities, but not equipment that is approved or operated with one door off or otherwise operated with a temporary reduced capability; The code follows the ISO 6346 standard.	Text (2)
ISO Equipment Type Name	Textual description of the size and type as detailed by the ISO 6346 standard.	Text(200)
ISO Equipment Type Group Code	Unique code for the different type groups defined by the ISO 6346 standard.	Text (2)

Table 16. ISO Equipment Type Code entity

Entity: ISO Equipment Code		
Identifies all the different types and sizes of equipment based on the different sizes, types, and purpose of the equipment, for example <i>20-foot reefer container</i> , based on the ISO 6346 standard.		
Attribute	Definition	Data type
ISO Equipment Code	Unique code for the different equipment size/type used for transporting commodities. The code is a concatenation of ISO Equipment Size Code and ISO Equipment Type Code A and follows the ISO 6346 standard.	Text (4)
ISO Equipment Name	Textual description for the equipment; follows the ISO 6346 standard.	Text(100)
ISO Equipment Size Code	ISO size code designation; two alphanumeric characters used to designate the size code of a piece of equipment. - The first character represents the length - The second character represents the width and the height The size code follows the ISO 6346 standard.	Text (2)
ISO Equipment Type Code A	Code for the different container types used for transporting commodities. For containers designed and tested with full stacking (minimum superimposed mass of 192,000 kilos) and racking (minimum transverse force of 150 kN) capabilities. Superimposed mass is as defined in ISO 1496-1:1990. The code follows the ISO 6346 standard.	Text (2)

Table 17. ISO Equipment Code entity

4.2.1 Equipment reference data

The accepted standard for defining the different types of equipment is ISO 6346. The reference data published as part of ISO 6346 have been modelled into a structure of six reference data entities in the Logical Data Model as shown in Figure 8, and examples, corresponding to the standards included in ISO 6346, are listed for each of the entities below.

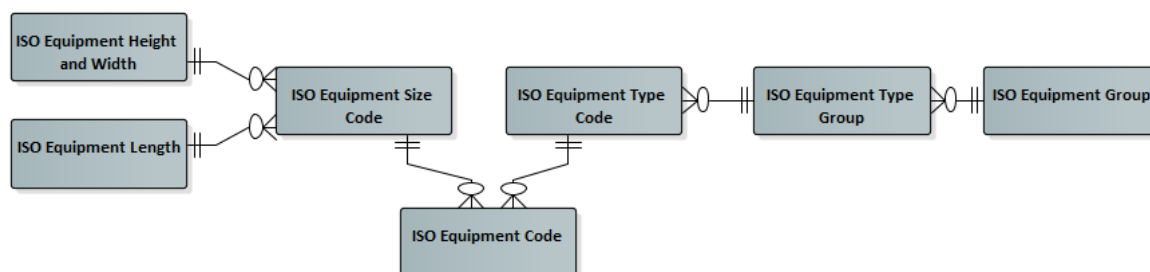


Figure 8. Equipment reference data entities

4.2.1.1 ISO equipment code

Table 18 contains examples of ISO 6346 equipment codes.¹ This list is a small part of the full list of ISO 6346 equipment codes and names. There are more than 15,000 unique equipment code combinations (not including ISO equipment type code B).

ISO Equipment Code	ISO Equipment Name
10G0	10ft General purpose container Without ventilation Opening(s) at one end or both ends
25R2	20ft Thermal container Self-powered refrigerated/heated Mechanically refrigerated
45P7	40ft Platform (container) Platform-based container for named cargo Car carrier

Table 18. ISO Equipment Code, examples

4.2.1.2 ISO equipment type code

Table 19 contains examples of ISO 6346 equipment type codes (ISO equipment code A is the last two characters of the ISO equipment code as shown in Table 18). This list is only a part of the full list of ISO 6346 equipment codes (A and B), type names, and type group codes. There are 62 type codes.

ISO Equipment Code A	ISO Equipment Code B	ISO Equipment Type Name	ISO Equipment Type Group Code
G0	GA	Opening(s) at one end or both ends	GP
R2	RD	Mechanically refrigerated	RS
P7	PW	Car carrier	PT

Table 19. ISO Equipment Type Code, examples

4.2.1.3 ISO equipment type group

Table 20 contains examples of ISO 6346 equipment type group codes. This list is only a part of the full range of ISO 6346 equipment type group codes, names, and group codes. There are 21 type group codes.

¹ NEN Standards Products & Services has granted the DCSA the permission to use the ISO 6346 equipment code examples in this publication.

ISO Equipment Type Group Code	ISO Equipment Type Group Name	ISO Equipment Group Code
GP	Without ventilation	G
RT	Refrigerated and heated	R
PT	Platform-based container for named cargo	P

Table 20. ISO Equipment Type Group, examples

4.2.1.4 ISO equipment group

Table 21 contains examples of ISO 6346 equipment group codes and names. This list is only a sample of the full list. There are 11 group codes.

ISO Equipment Group Code	ISO Equipment Group Name
G	General purpose container
R	Thermal container
P	Platform (container)

Table 21. ISO Equipment Group, examples

4.2.1.5 ISO equipment size code

Table 22 contains examples of ISO 6346 equipment size codes (the ISO equipment size code is the first two characters of the ISO equipment code). This list is only a sample of the full list. There are 255 equipment size codes.

ISO Equipment Size Code	ISO Equipment Length Code	ISO Equipment Height and Width Code
10	1	0
25	2	5
45	4	5

Table 22. ISO Equipment Size Code, examples

4.2.1.6 ISO equipment height and width

Table 23 contains examples of ISO 6346 height width codes. This list is only a sample of the full list. There are 15 height and width codes.

ISO Equipment Height and Width Code	ISO Equipment Height mm	ISO Equipment Height ft in	ISO Equipment Width mm	ISO Equipment Width ft
0	2438 mm	8ft	2438 mm	8ft
5	2895 mm	9ft 6in	2438 mm	8ft
F	> 2895 mm	> 9ft 6in	> 2438 mm and < 2500 mm	

Table 23. ISO Equipment Height and Width, examples

4.2.1.7 ISO equipment length

Table 24 contains examples of ISO 6346 equipment length codes. This list is only a sample of the full list. There are 23 different length codes of which six are currently unassigned.

ISO Equipment Length Code	ISO Equipment Length mm	ISO Equipment Length ft
2	6,096 mm	20ft
4	12,192 mm	40ft
L	13,716 mm	45ft

Table 24. ISO Equipment Length, examples

4.3 Transport

The Transport subject area consists of three entities for storing different details of transport related information, with one entity covering a reference data set. The subject area is modelled around the key entity of Transport for storing specific instances of transport and a subtype (Vessel), which captures vessel-specific details. The Transport entity is linked to the Mode of Transport entity, describing the possible modes of transport. An additional attribute has been added to this reference data entity, i.e. the DCSA Transport Type, to provide shipping industry specific terminology rather than more generic terms as defined by the UN/CEFACT.

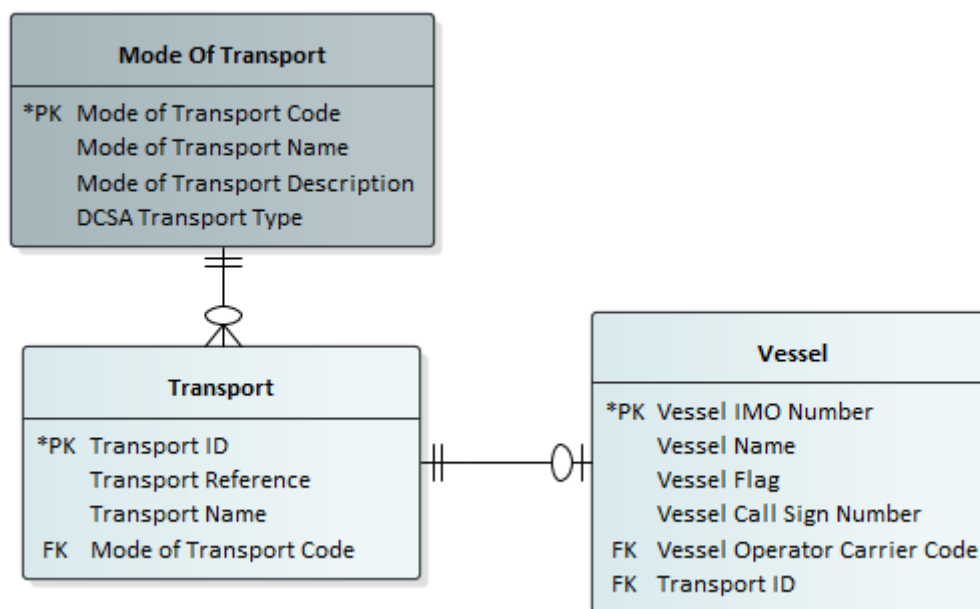


Figure 9. Transport subject area

The transport related entities within the Transport subject area have been defined and detailed in the tables below.

Entity: Mode of Transport		
The code specifying the transport mode for the logistic transport movement, following the UN/CEFACT Recommendation 19 - Codes for Modes of Transport mapped to the transport types as defined in the DCSA Glossary of Terms.		
Attribute	Definition	Data type
Mode of TransportCode	The code specifying the mode (e.g. transport by rail) for the transport. The code follows UN/CEFACT Recommendation 19 - Codes for Modes of Transport.	Number
Mode of Transport Name	The name of the mode of transport. The code follows UN/CEFACT Recommendation 19 - Codes for Modes of Transport.	Text(100)
Mode of Transport Description	The description of the mode of transport as detailed by UN/CEFACT Recommendation 19 - Codes for Modes of Transport.	Text(250)
DCSA Transport Type	The DCSA defined types of transport as used in events mapped to the Mode of Transport Code.	Text(50)

Table 25. Mode of Transport entity

Entity: Transport		
The transport instance used to convey goods or other objects from place to place during logistics cargo movements.		
Attribute	Definition	Data type
Transport ID	The unique identifier for the transport. The uniqueness of each row is based on: - Transport Reference - Mode of Transport Code	Number
Transport Reference	The reference for the transport, e.g. when the mode of transport is a vessel, the Transport Reference will be the vessel IMO number.	Text(50)
Transport Name	The name of the particular transport instance, e.g. for a vessel, this is the vessel name.	Text(100)
Mode of Transport Code	The code specifying the mode (e.g. transport by rail) for the transport. The code follows UN/CEFACT Recommendation 19 - Codes for Modes of Transport.	Number

Table 26. Transport entity

Entity: Vessel		
A floating structure with either internal mode of propulsion designed for the transport of cargo and/or passengers. Vessels are sea going but can be either mother vessels (deep sea/ocean) or feeder vessels (short sea).		
Attribute	Definition	Data type
Vessel IMO Number	The unique reference for a registered Vessel. The reference is the International Maritime Organisation (IMO) number, also sometimes known as the Lloyd's register code, which does not change during the lifetime of the vessel.	Text(7)
Vessel Name	The name of the Vessel given by the Vessel Operator.	Text(35)
Vessel Flag	The flag of the nation whose laws the vessel is registered under. This is the ISO 3166 two-letter country code.	Text (2)
Vessel Call Sign	A unique alphanumeric identity that belongs to the vessel and is assigned by the International Telecommunication Union (ITU). It consists of a three-letter alphanumeric prefix that indicates nationality, followed by one to four characters to identify the individual vessel. For instance, vessels registered under Denmark are assigned the prefix ranges 5PA-5QZ, OUA-OZZ, and XPA-XPZ. The Call Sign changes whenever a vessel changes its flag.	Text(10)
Vessel Operator Carrier Code	The carrier who is in charge of the vessel operation.	Text(10)
Transport ID	The link back to the Transport entity	Text(50)

Table 27. Vessel entity

4.3.1 Transport reference data

The Mode of Transport reference data entity contains the different modes of transport available to complete a shipment as shown in Figure 10.

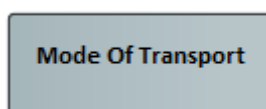


Figure 10. Transport reference data entity

4.3.1.1 Mode of Transport

Table 28 contains the overview of mode of transport codes and names as published by the UN/CEFACT.² In the below overview, these are linked to the DCSA-defined transport types.

Mode of Transport Code	Mode of Transport Name	Mode of Transport Description	DCSA Transport Type
0	Transport mode not specified	Transport mode has not been specified	
1	Maritime transport	Transport of goods and/or persons is by sea	Vessel
2	Rail transport	Transport of goods and/or persons is by rail	Rail
3	Road transport	Transport of goods and/or persons is by road	Truck
4	Air transport	Transport of goods and/or persons is by air	
5	Mail	Method to convey goods is by mail	
6	Multimodal transport	Method to convey goods and/or persons is by multimodal transport	
7	Fixed Transport installation	Transport of item is via a fixed transport installation	
8	Inland water Transport	Transport of goods and/or persons is by inland water	Barge
9	Transport mode not applicable	The mode of transport is not applicable	

Table 28. Mode of Transport

4.4 Event

The Event subject area as shown in Figure 11 covers the three key entities of Equipment Event, Transport Event, and Shipment Event, which relate to specific journeys in the track and trace and the operational vessel schedules domain.

4.4.1 Event structure and naming convention

The model design relating to the Equipment, Transport and Shipment Events is based on the Event Structure work that has been published by the DCSA. Please refer to the DCSA Event Naming Convention and Event Structure Definitions to get more information about the definitions, syntax, parameters, and values for the events.

An event occurs with relation to the central entities of Shipment (for example, Shipment Release Message Issued), Transport (for example, Actual Vessel Departure from Port Terminal), and Equipment (for example, Actual Gate in of Laden Equipment at Port Terminal). These events have been documented by the DCSA Event Naming Convention and Event Structure Definitions supported with the DCSA reference data. The Shipment, Transport, and Equipment events have been modelled separately to keep the logical association of what the specific event relates to, for example:

- All types of events relating to shipment to be captured in the Shipment Event Type
- All types of events relating to transport to be captured in the Transport Event Type
- All types of events relating to equipment to be captured in the Equipment Event Type.

Each of the above event types can further be related to the estimated, planned, or actual state captured in the Event Classifier entity, and each Event also has specific entities that only relate to those types of events, e.g. Equipment Event is related to the Empty Indicator. The entities involved in the Events subject area can be found in the figure below:

² https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec19/rec19_ecetr138.pdf accessed September 2, 2019.

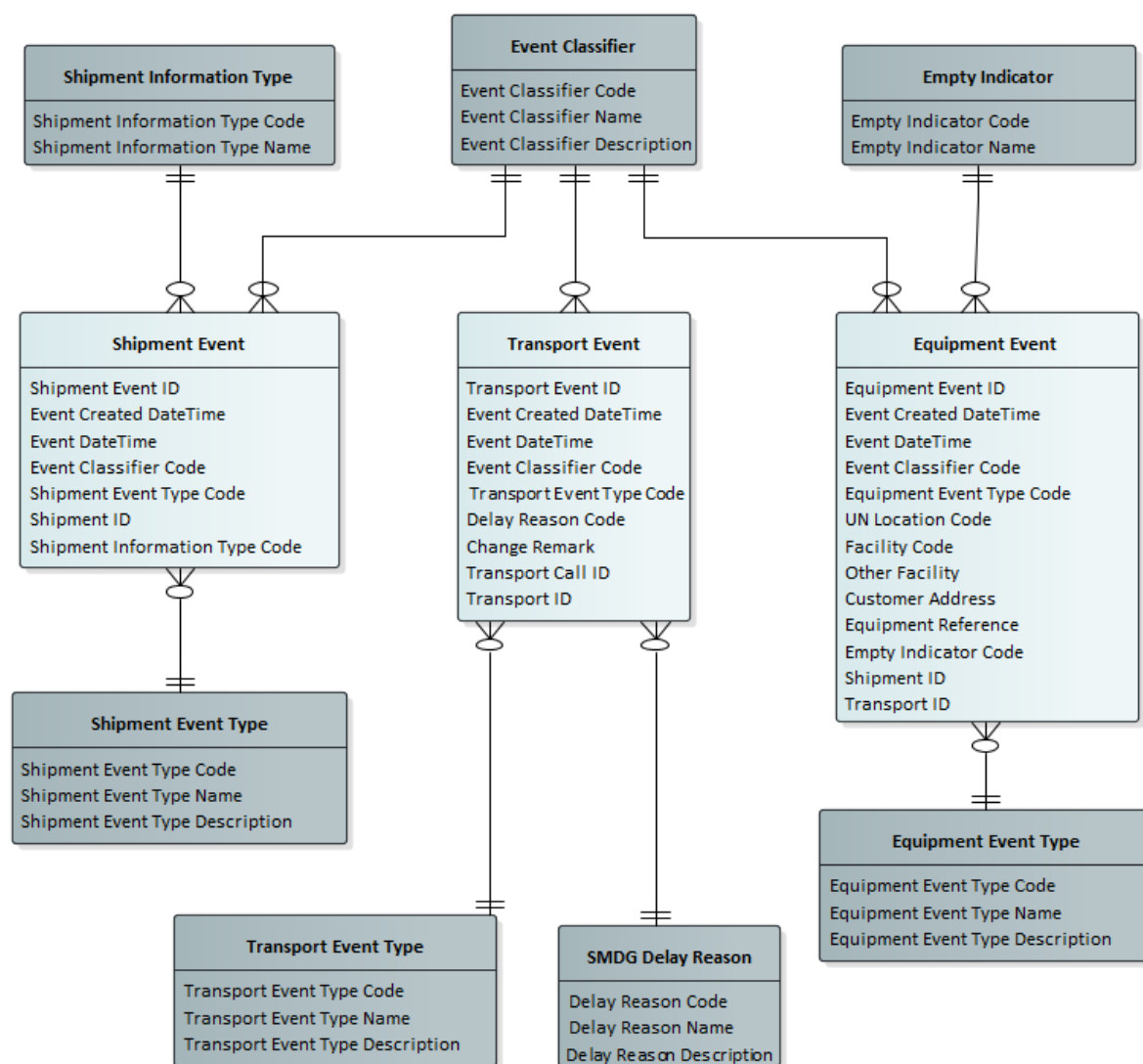


Figure 11. Event subject area

Each entity within the Event subject area is defined in Table 29, Table 30, Table 31, Table 32, Table 33, Table 34, Table 35, Table 36, Table 37 and Table 38 together with descriptions of the data attributes needed and the data type for each data attribute.

Entity: Event Classifier		
Classifier denoting whether the event is planned, estimated or actual.		
Attribute	Definition	Data type
Event Classifier Code	Code for the event classifier, either PLN, ACT or EST.	Text (3)
Event Classifier Name	Name of the classifier.	Text(100)
Event Classifier Description	The description of the event classifier.	Text(250)

Table 29. Event Classifier entity

Entity: Empty Indicator		
The Status of the equipment as to whether it is empty or laden. These are the two values that are currently tracked.		
Attribute	Definition	Data type
Empty Indicator Code	Code to denote whether the equipment is empty or laden. The values are EMPTY or LADEN.	Text (5)
Empty Indicator Name	Name to denote whether the equipment is empty or laden. The values are EMPTY or LADEN.	Text(100)

Table 30. Empty Indicator entity

Entity: Shipment Information Type		
Identifies the specific information type that a shipment event relates to.		
Attribute	Definition	Data type
Shipment Information Type Code	The code to identify the type of information that is related to the shipment.	Text (3)
Shipment Information Type Name	The description of the event that is related to the type of information related to the shipment, e.g. Booking, Arrival Notice or Transportation document.	Text(100)

Table 31. Shipment Information Type entity

Entity: Shipment Event Type		
This describes the types events that can relate to a shipment e.g. Booking <u>confirmed</u> .		
Attribute	Definition	Data type
Shipment Event Type Code	The code to identify the event that is related to the Shipment.	Text (4)
Shipment Event Type Name	The description of the event that is related to the Shipment, e.g. Booking confirmed.	Text(100)
Shipment Event Type Description	The description of each event type.	Text(250)

Table 32. Shipment Event Type entity

Entity: Equipment Event Type		
This describes the types events that can relate to an equipment e.g. Equipment <u>loaded</u> onto vessel.		
Attribute	Definition	Data type
Equipment Event Type Code	The code to identify the event that is related to the equipment.	Text (4)
Equipment Event Type Name	The name of the event that is related to the equipment, e.g. loaded.	Text(100)
Equipment Event Type Description	The description of the event that is related to the equipment.	Text(250)

Table 33. Equipment Event Type entity

Entity: Transport Event Type		
This describes the types events that can relate to a transport. e.g. Vessel <u>departed</u> .		
Attribute	Definition	Data type
Transport Event Type Code	The code to identify the type of event that is related to the transport.	Text (4)
Transport Event Type Name	The name of the event type for the Transport Event Code, e.g. Vessel departed.	Text(100)
Transport Event Type Description	The description of the event type.	Text(250)

Table 34. Transport Event Type entity

Entity: Shipment Event		
An event that happens to a shipment		
Attribute	Definition	Data type
Shipment Event ID	Unique identifier for the shipment event captured. The uniqueness of each row is based on: • Shipment ID • Shipment Information Type Code • Shipment Event Type Code • Event Classifier Code • Event Created DateTime	Text(50)
Event Created DateTime	The date and time when the event entry was created.	DateTime
Event DateTime	Indicating the date and time of when the event occurred or will occur.	DateTime
Event Classifier Code	Code for the event classifier, either PLN, ACT or EST.	Text (3)
Shipment Event Type Code	The code to identify the event that is related to the shipment.	Text (4)
Shipment Information Type Code	The code to identify the type of information that is related to the shipment.	Text (3)
Shipment ID	Unique identifier for the shipment.	Number

Table 35. Shipment Event entity

Entity: Equipment Event		
An event that happens to an equipment item, e.g. a container loaded onto vessel at port terminal.		
Attribute	Definition	Data type
Equipment Event ID	Unique identifier for the equipment event captured. The uniqueness of each row is based on: • Shipment ID • Equipment Reference • Equipment Event Type Code • Event Classifier Code • Event Created DateTime	Text(50)
Shipment ID	Unique identifier for the shipment.	Number
Event Created DateTime	The date and time when the event entry was created.	DateTime
Event DateTime	Indicating the date and time of when the event occurred or will occur.	DateTime
Event Classifier Code	Specifies the code for the classifier of the event, e.g. Actual	Text (3)
Equipment Event Type Code	The code to identify the type of event that is related to the equipment.	Text (4)
Transport ID	Specifies the transport involved in the event, where applicable. E.g. in the case of a load event, this specifies which transport the equipment has been loaded on to.	Text(50)
UN Location Code	The UN Location where the event occurs	Text (5)
Facility Code	The specific facility where the event occurs	Text(11)
Other Facility	An alternative way to capture the facility, when no standardised DCSA facility code can be found.	Text(50)
Customer Address	An address such as business address or home address.	Text(50)
Equipment Reference	Reference that uniquely identifies the equipment involved in the event	Text(15)
Empty Indicator Code	Code to denote whether the equipment is empty or laden	Text (5)

Table 36. Equipment Event entity

Entity: Transport event		
An event that happens to a transport instance, e.g. Vessel departed.		
Attribute	Definition	Data type
Transport Event ID	Unique identifier for the transport event captured. The uniqueness of each row is based on: - Transport Call ID - Transport ID - Transport Event Type Code - Event Classifier Code - Event Created DateTime	Text(50)
Event Created DateTime	The date and time when the event entry was created.	DateTime
Event DateTime	Indicating the date and time of when the event occurred or will occur.	DateTime
Event Classifier Code	Specifies the code for the classifier of the event, e.g. Actual	Text (3)
Transport Event Type Code	The code to identify the type of event that is related to transport.	Text (4)
Transport ID	Specifies the transport involved in the event	Text(50)
Transport Call ID	Specifies the transport call involved in the event	Text(50)
Delay Reason Code	Code for the delay reason as provided by SMDG.	Text (3)
Change Remark	Free text description of the reason for the change in schedule.	Text(250)

Table 37. Transport event entity

Entity: SMDG Delay Reason		
Delay reasons as provided by SMDG.		
Attribute	Definition	Data type
Delay Reason Code	Code for the delay reason as provided by SMDG.	Text (3)
Delay Reason Name	Name of the delay reason as provided by SMDG.	Text(100)
Delay Reason Description	The description the delay reason as provided by SMDG.	Text(250)

Table 38. SMDG Delay Reason entity

4.4.2 Event reference data

The dark grey entities in Figure 12 below, show which entities store reference data.

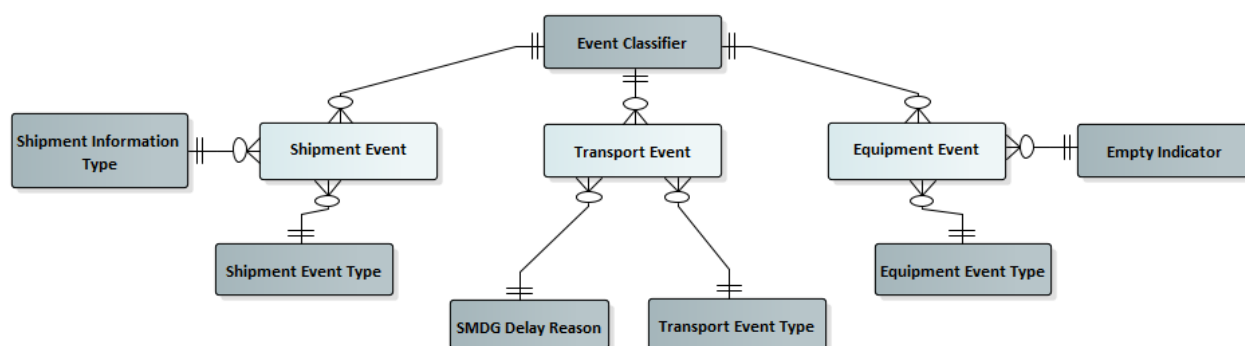


Figure 12. Event reference data entities

4.4.2.1 Event Classifier

Table 39 contains the code and name for the event classifier.

Event Classifier Code	Event Classifier Name
EST	Estimated
ACT	Actual
PLA	Planned

Table 39. Event Classifier

4.4.3 SMDG Delay Reason reference data

This table contains the different Delay Reason codes and the description of them as defined by SMDG³.

Entity: SMDG Delay Reason Reference Data	
This table contains a sample of Delay Reason Codes from SMDG.	
Delay Reason Code	Name
1 – Ship Related	
ACC	Accident involving personnel
DEV	Deviation to avoid bad weather
STW	Stowage adjustment
VGR	Vessel Gear Breakdown
2 – Shore related	
AIP	Accident involving personnel
ANA	Authorities not available
BUN	Bunkering delays
CGS	Arr OFF Proforma - Berth congestion
PRD	Low Productivity
QUA	Quarantine Inspection
YRD	Yard congestion
OTS	Others – Shore related
3 – Cargo related	
CAE	Cargo - Awaiting Exports
CIN	Cargo inspection by Authorities
DIN	Deficient or inadequate information

Table 40. Delay Reason Codes

4.4.3.1 Empty Indicator

Table 41 contains the Empty Indicator code and name.

Empty Indicator Code	Empty Indicator Name
EMPTY	Empty
LADEN	Laden

Table 41. Empty Indicator

4.4.3.2 Equipment Event Type

Equipment Event Type Code	Equipment Event Type Name
LOAD	Load
DISC	Discharge
GTIN	Gate in
GTOT	Gate out
STUF	Stuffing
STRP	Stripping

Table 42. Equipment Event Type

4.4.3.3 Transport Event Type

³ The full list is available at <http://www.smdg.org/smdg-code-lists/>

Transport Event Type Code	Transport Event Type Name
ARRI	Arrival
DEPA	Departure

Table 43. Transport Event Type

4.4.3.4 Shipment Event Type

Shipment Event Type Code	Shipment Event Type Name
RECE	Received
CONF	Confirmed
ISSU	Issued
APPR	Approved
SUBM	Submitted
SURR	Surrendered
REJE	Rejected
PENA	Pending approval

Table 44. Shipment Event Type

4.4.3.5 Shipment Information Type

Shipment Information Type code	Shipment Information Type Name
BOK	Booking
SHI	Shipping Instruction
VGM	Verified Gross Mass
SRM	Shipment Release Message
TRD	Transport Document
ARN	Arrival Notice

Table 45. Shipment Information Type

4.5 Location

The modelling of the Location subject area as shown in Figure 13, consists of the four reference data entities of Country, UN Location, Facility, and Facility Type. Location, as identified within the UN Location Code entity, is at a more granular level than the one identified within the Country entity (the Country Code). The location identifier within the Facility entity (the Facility Code), is at an even more granular level than the location provided by the UN Location Code. Also, each Facility must have a Facility Type Code. To make it possible to track the location of an event, the Facility entity is also linked to each of the Event entities for Equipment and Transport. These entities are described in the Event subject area.

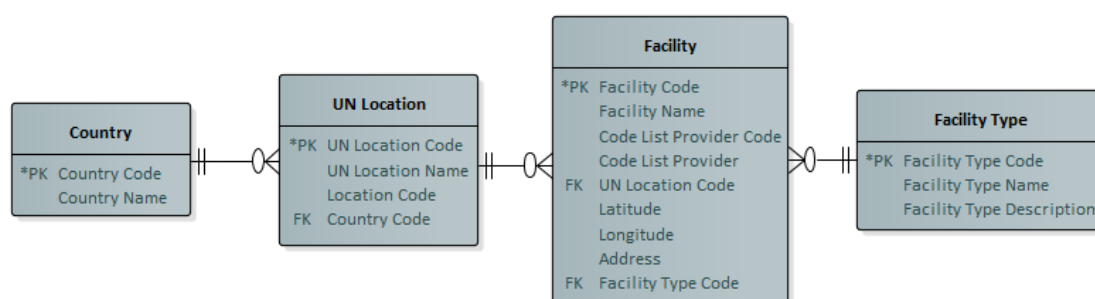


Figure 13. Location subject area

In Table 46, Table 47, Table 48, and Table 49 below, the definitions of the entities Country, UN Location Code, Facility, and Facility Type and the appertaining attributes are listed.

Entity: Country		
Country name as defined by the ISO 3166 standard published by ISO. The standard defines codes for the names of countries, dependent territories, and special areas of geographical interest.		
Attribute	Definition	Data type
Country Code	The two-letter ISO 3166 country code. E.g. BE for Belgium.	Text (2)
Country Name	The full name for the country as defined by ISO 3166-1.	Text(75)

Table 46. Country entity

Entity: UN Location		
A location as defined by UNECE and commonly known as "UN/LOCODE" ("United Nations Code for Trade and Transport Locations"). The UN Location identifies a location in the sense of a city/a town/a village, being the smaller administrative area existing as defined by the competent national authority in each country.		
Attribute	Definition	Data type
UN Location Code	The UN Location Code identifies a location in the sense of a city/a town/a village, being the smaller administrative area existing as defined by the competent national authority in each country. A complete UN Location Code is a combination of a two-character country code and a three-character city/town/area Location Code, e.g. BEANR is known as the city of Antwerp (ANR), which is located in Belgium (BE).	Text (5)
UN Location Name	The name of the location as defined by the UNECE.	Text(100)
Location Code	Location Code identifies a location in the sense of a city/a town/a village, being the smaller administrative area existing as defined by the competent national authority in each country. Location Code is a three-character code e.g. ANR for Antwerp.	Text (3)
Country Code	The country that the UN Location belongs to.	Text (2)

Table 47. UN Location entity

Entity: Facility		
The facility is a location entity at sub-level to UN Location Code and provides the locational context to the event, which is being reported on, as defined by the DCSA.		
Attribute	Definition	Data type
Facility Code	The code used for identifying the specific facility. Up to eleven characters, including the five characters from the UN Location Code.	Text(11)
Facility Name	The name of the facility.	Text(100)
Code List Provider Code	The code provided for the Facility by the code list provider. This code does not need to be unique on its own. It is used together with the UN Location Code to create the unique attribute Facility Code.	Text(6)
Code List Provider	The organisation providing the code list, e.g. SMDG or BIC.	Text(8)
UN Location Code	The UN Location code specifying where the Facility is located	Text(5)
Latitude	The latitude for the specific facility. A geographic location identifier following ISO 6709.	Number
Longitude	The longitude for the specific facility. A geographic location identifier following ISO 6709.	Number
Address	The address of the facility.	Text(250)
Facility Type Code	Code that identifies the type of the facility	Text(4)

Table 48. Facility entity

Entity: Facility Type		
The Facility Type entity provides the locational context to the event, which is being reported on. The facility types are defined as unique types of areas, where equipment and/or a transport type can be located for a specified period. Defined by the DCSA.		
Attribute	Definition	Data type
Facility Type Code	Four-character code to identify the specific type of facility.	Text (4)
Facility Type Name	The name of the facility type.	Text(100)
Facility Type Description	The description of the facility type.	Text(250)

Table 49. Facility Type entity

4.5.1 Location reference data

There are four sets of reference data in the Location subject area as shown in Figure 14. Examples of each of these are listed in the tables below.

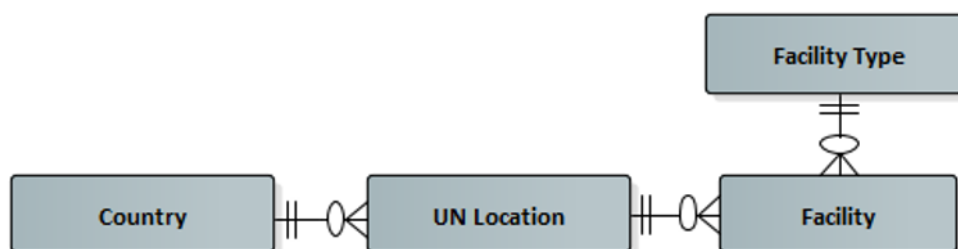


Figure 14. Location reference data entities

4.5.1.1 Country

Table 50 contains examples of country names and codes as published by ISO. The full country list (ISO 3166-1) can be procured via the ISO Online Browsing Platform (OBP).⁴

⁴ <https://www.iso.org/obp/ui/#search> accessed on September 2, 2019.

Country Code	Country Name
AL	Albania
BR	Brazil
HR	Croatia
DK	Denmark
SV	El Salvador

Table 50. Country

4.5.1.2 UN Location

The first two characters of the UN Location Code are the ISO 3166-1 alpha-2 Country Code, which are followed by a three-character code representing a city/a town area location within the country. An area containing several functions (port, train station, airport, etc.) should still only have one UN Location Code assigned.

Table 51 contains examples of location names and codes as provided by the UN/ECE linked to the Country Code. Combining the Country Code and the Location Code constitutes the UN Location Code.

UN Location Code	Country Code	Location Code	UN Location Name
ALMIL	AL	MIL	Milot
BRAGS	BR	AGS	Alagoinhas
HRVUK	HR	VUK	Vukovar
DKAAR	DK	AAR	Aarhus
SVSMG	SV	SMG	San Miguel

Table 51. UN Location

4.5.1.3 Facility

Table 52 contains examples of facility codes and their appertaining attributes. Note: latitude and longitude are displayed in DMS (degree-minutes-seconds) format in the table below for display purposes only.

Facility Code	Facility Name	Code List Provider Code	Code List Provider	UN Location Code	Latitude	Longitude	Address	Facility Type Code
AEAUH ADT	KHALIFA PORT CONTAIN ER TERMINAL	ADT	SMDG	AEAUH	N 24° 48' 37"	E 054° 38' 46"	Khalifa Port Container Terminal Building 70 Taweelah - Abu Dhabi - U.A.E.	POTE
AUBNE DPBNE	DP WORLD BRISBANE FISHERMA N ISLANDS	DPBNE	SMDG	AUBNE	S 27° 22' 23"	E 153° 10' 14"	Wharf 4, Port Drive, Fisherman Islands, Port of Brisbane, QLD 4178, Australia	POTE
INNSA GTICI	GATEWA Y TERMINAL S INDIA (GTI)	GTICI	SMDG	INNSA	N 18° 56' 54"	E 072° 56' 29"	APM Terminals Mumbai, Gateway Terminals India Pvt. Ltd., GTI House, JNPT, Sheva, Navi Mumbai 400707, India	POTE

Table 52. Facility

4.5.1.4 Facility Type

Table 53 contains the different Facility Type codes, their names, and the description of them as defined by the DCSA.

Facility Type Code	Facility Type Name	Facility Type Description
BOCR	Border crossing	Border crossing is the point at a border between two countries where people, transports or goods can cross. This may or may not include a customs checkpoint.
CLOC	Customer location	Customer location is the premise of the customer, who can be either the shipper or the consignee.
COFS	Container freight station	Container freight station is a facility where LCL (Less Than Container Load) shipments are consolidated or dispersed, cargo is stuffed into containers prior to shipment, or cargo is stripped from containers prior to release to the consignee.
COYA	Container yard	Container yard is a facility in relative proximity to a port or inland terminal for intermediate storage of equipment. This facility, as an alternative to storing equipment at the port or inland terminal, provides intermediate storage of equipment until loading for the next transport leg can commence. This is also known as off-dock storage.
DEPO	Depot	Depot is a designated area where empty equipment is stored between use.
INTE	Inland terminal	Inland terminal is a facility where containers are loaded, moved or discharged. The inland terminal can be serviced by trucks, rail and barges (at river terminals).
POTE	Port terminal	Port terminal is a facility located adjacent to a waterway where containers are loaded, moved or discharged onto/from sea-going vessels and barges.
PBST	Pilot boarding station	The place where a pilot boards the vessel upon arrival at the port boundaries.

Table 53. Facility Type

4.6 Vessel Sharing Agreement

The Vessel Sharing Agreement subject area is modelled below in Figure 15 and consists of the four entities: Vessel Sharing Agreement, Vessel Sharing Agreement Type, Vessel Sharing Agreement Partner and Tradelane. Vessel sharing agreement is used as an umbrella term to cover the different agreement types which carriers can agree on.

The Vessel Sharing Agreement subject area and its entities will allow for the identification of the partners in a vessel sharing agreement and which Tradelane the agreement relates to. The Vessel Sharing Agreement Type entity defines the different types of agreements, and the Vessel Sharing Agreement is used to outline the specific agreement. The Vessel Sharing Agreement Partner entity shows who the involved partners are in the agreement. The Tradelane entity indicates which directional trade the agreement relates to and is linked to the Service entity (described in the Service subject area) to enable the ability to specify which services are covered in the Tradelane.

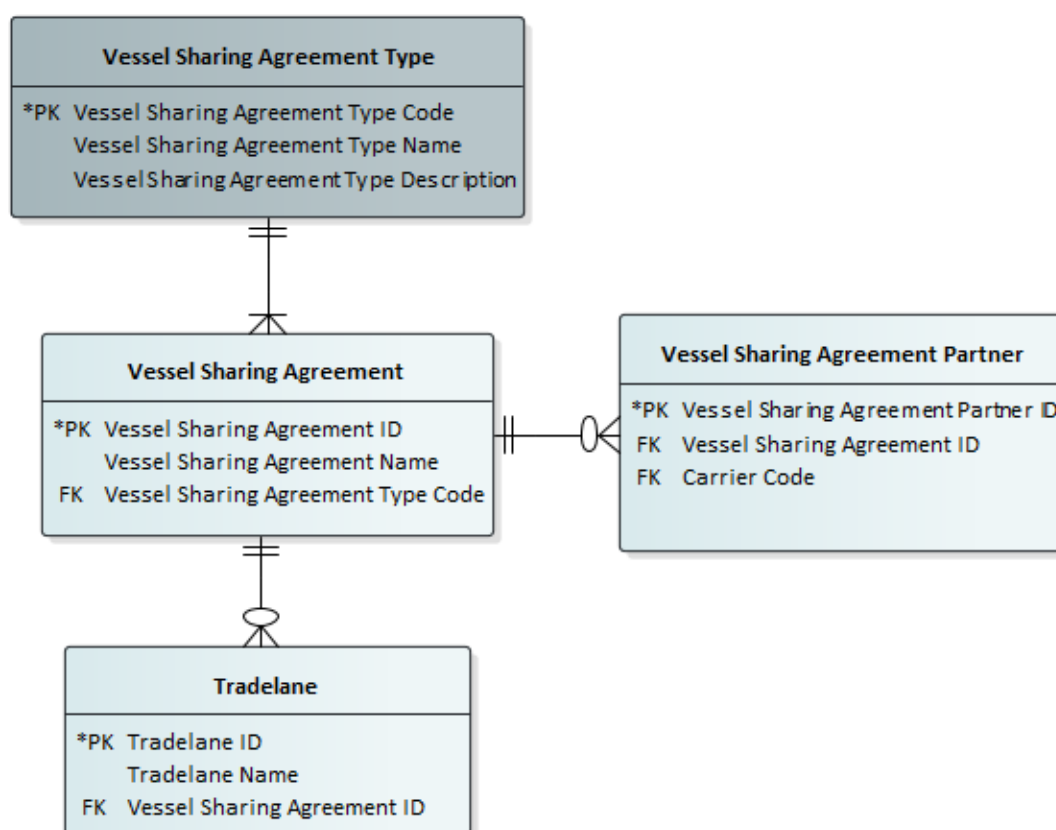


Figure 15. Vessel Sharing Agreement subject area

The agreement-related entities within the Vessel Sharing Agreement subject area are defined and detailed in Table 54, Table 55, Table 56 and Table 57.

Entity: Vessel Sharing Agreement		
An agreement between two or more shipping lines to share vessel capacity on specific trades to increase asset utilisation.		
Attribute	Definition	Data type
Vessel Sharing Agreement ID	The identifier for the agreement.	Number
Vessel Sharing Agreement Name	The name of the vessel sharing agreement.	Text(50)
Vessel Sharing Agreement Type Code	The code to identify the specific type of vessel sharing agreement.	Text (3)

Table 54. Vessel Sharing Agreement entity

Entity: Vessel Sharing Agreement Partner		
A participant in a vessel sharing agreement.		
Attribute	Definition	Data type
Vessel Sharing Agreement Partner ID	The unique identifier for the VSA and its partners. The uniqueness of each row is based on: - Carrier Code - Vessel Sharing Agreement ID	Number
Carrier Code	Identifies the carrier involved in the VSA	Text (10)
Vessel Sharing Agreement ID	Identifies the VSA.	Number

Table 55. Vessel Sharing Agreement Partner entity

Entity: Vessel Sharing Agreement Type		
A specific type of vessel sharing agreement.		
Attribute	Definition	Data type
Vessel Sharing Agreement Type Code	The code to identify the specific type of vessel sharing agreement.	Text (3)
Vessel Sharing Agreement Type Name	The name of the specific type of vessel sharing agreement.	Text(50)
Vessel Sharing Agreement Type Description	A description for a specific type of VSA, as detailed by the DCSA.	Text(250)

Table 56. Vessel Sharing Agreement Type entity

Entity: Tradelane		
An East/West or North/South directional trade indicator identifying the geographic area being covered by a specific carrier or service. A Tradelane can have many Services (E.g. Transpacific East-bound).		
Attribute	Definition	Data type
Tradelane ID	The unique identifier for the Tradelane.	Text(8)
Tradelane Name	The name of the Tradelane.	Text(150)
Vessel Sharing Agreement ID	The identifier for the vessel sharing agreement.	Number

Table 57. Tradelane entity

4.6.1 Vessel Sharing Agreement reference data

The reference data entity in the Vessel Sharing Agreement subject area, indicates which type of agreement the partners are involved in.

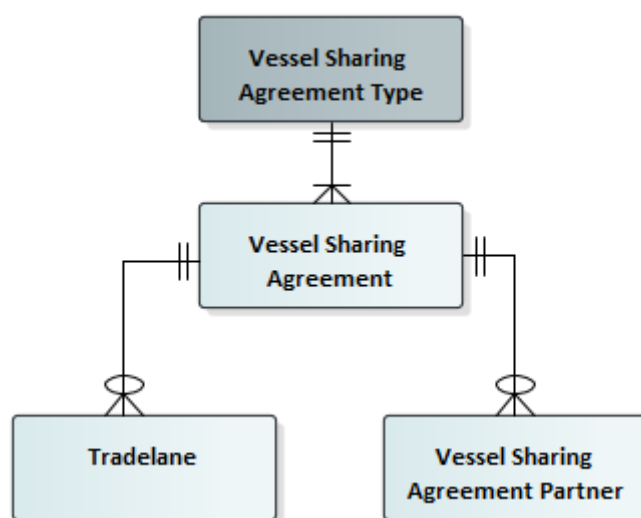


Figure 16. Vessel Sharing Agreement reference data entities

Table 58 contains the Vessel Sharing Agreement Type Code, Name and Descriptions.

Vessel Sharing Agreement Type Code	Vessel Sharing Agreement Type Name	Vessel Sharing Agreement Type Description
VSA	Vessel Sharing Agreement	An agreement between two or more carriers agreeing to share vessel capacity in specific trades using a specified number of vessels.
SCA	Slot Charter Agreement	An agreement between two carriers to sell or exchange a specific number of TEU slots in one or more trades.

Table 58. Vessel Sharing Agreement reference data

4.7 Service

The modelling of the Service subject area as shown in Figure 17 consists of the two entities: Service and Service Proforma.

Services are the central constituents of each carrier's network. They are typically operated on a weekly schedule. The Service Proforma entity has been modelled on a reduced scope and only caters for storing one version (latest) at any point in time, with a limited amount of details being captured.

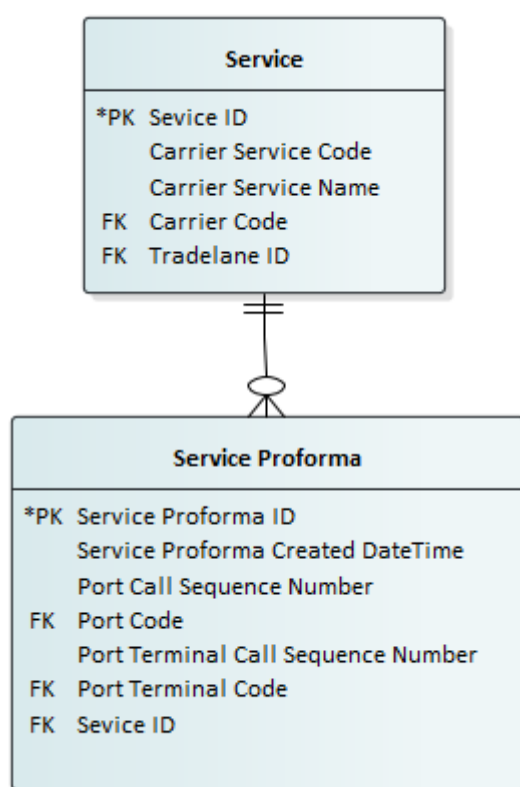


Figure 17. Service subject area

The related entities within the Service subject area are defined and detailed in Table 59 and Table 60.

Entity: Service		
The roundtrip sequence of ports being served by a vessel on a specific Proforma (schedule).		
Attribute	Definition	Data type
Service ID	The unique identifier of the Service. The uniqueness of each row is based on: - Carrier Service Code - Carrier Code	Number
Carrier Service Code	The code for the service. This is unique for each carrier.	Text (5)
Carrier Service Name	The name of the service as provided by the carrier operating the vessel.	Text(50)
Carrier Code	Code identifying the carrier who provides the Code and name for the service	Text(10)
Tradelane ID	The Tradelane that the service is based upon	Number

Table 59. Service entity

Entity: Service Proforma		
The Proforma, which the VSA Partners have agreed to.		
Attribute	Definition	Data type
Service Proforma ID	The unique identifier for a Service Proforma. The uniqueness of each row is based on: - Service ID - Service Proforma Created DateTime	Number
Service Proforma Created DateTime	The date when all vessel sharing agreement partners have agreed to the new Proforma.	DateTime
Transport Call Number	The port number in the sequence of ports that are or will be called on a voyage, as it is defined in the proforma prior to the voyage. This is useful to identify a unique call, when calls are made to the same port more than once.	Number
Port Terminal Call Sequence Number	The Port Terminal number in the sequence of port terminals that are or will be called on a specific port call (as identified by the Port Call Sequence Number). This is useful to identify a unique port terminal call when calls are made to the same terminal more than once.	Number
Service ID	The identifier of the Service	Number
Port Code	Identifies the port being called as a UN Location code	Text (5)
Port Terminal Code	Identifies the port terminal being called as an SMDG port terminal code	Text(11)

Table 60. Service Proforma entity

4.8 Transport Journey

The Transport Journey subject area, as shown in Figure 18, consists of the four entities: Transport Journey, Voyage, Transport Journey Call and Transport Call. The Transport Journey entity stores each journey of a specific instance of transport. The Voyage entity is a subtype of Transport Journey, specific to where the Mode of Transport is a Vessel.

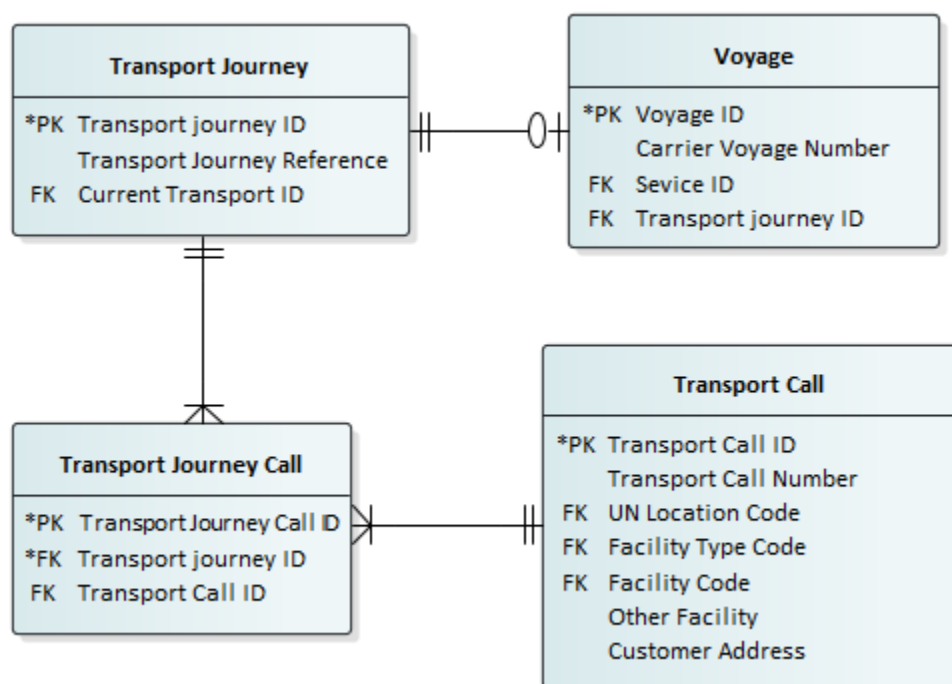


Figure 18. Voyage and Event subject area

The related entities within the Transport Journey subject area are defined and detailed in Table 61, Table 62, Table 63 and Table 64.

Entity: Transport Journey		
This is a journey embarked on by a specific transport instance with a start and end point.		
Attribute	Definition	Data type
Transport Journey ID	The unique identifier of the Transport Journey. The uniqueness of each row is based on: • Transport ID • Transport Journey Reference	Number
Current Transport ID	Identifies the transport instance embarking on the journey	Text(50)
Transport journey reference	The transport journey reference will be specific per mode of transport: • Vessel: Voyage number • Truck: Not yet specified • Rail: Not yet specified • Barge: Not yet specified	Text(50)

Table 61. Transport Journey entity

Entity: Transport Journey Call		
A list of all the locations involved in a transport journey.		
Attribute	Definition	Data type
Transport Journey Call ID	The unique identifier for a Transport Journey Call. The uniqueness of each row is based on: • Transport Journey ID • Transport Call ID	Number
Transport Journey ID	The transport journey that relates to the transport call	Number
Transport Call ID	The transport call that relates to the transport journey	Text(50)

Table 62. Transport Journey Call entity

Entity: Transport Call		
A list of all the locations involved in a transport journey.		
Attribute	Definition	Data type
Transport Call ID	The unique identifier for a Transport Call. The uniqueness of each row is based on: - Transport Journey ID - Transport Call Sequence Number	Text(50)
Transport Call Number	A number to identify a unique transport call. This is not necessarily the actual sequence in which the calls were made, e.g. an ad-hoc call may be added as the last sequence number for a journey, but may actually take place before other planned calls, which have a lower number	Number
UN Location Code	The location of the call, expressed as a UN Location Code	Text(5)
Facility Type Code	Code that identifies the type of the facility	Text(4)
Facility Code	The facility where the call occurs	Text(11)
Other Facility	An alternative way to capture the facility details, when no standardised DCSA facility code can be found.	Text(50)
Customer Address	Free text to capture the customer address, where applicable	Text(250)

Table 63. Shipment Transport entity

Entity: Voyage		
A part of a service roundtrip that normally changes at the geographical “end-point” of a vessel rotation. As such, that specific port call can have two voyage numbers: one for the discharge of final shipments on the “current” voyage, and one that identifies the commencement of loading shipments (for allocation purposes). One rotation will normally have 2 voyages, one on each haul.		
Attribute	Definition	Data type
Voyage ID	The identifier of the Voyage. The uniqueness of each row is based on: - Service ID - Carrier Voyage Number	Number
Carrier Voyage Number	The vessel operator specific identifier of the Voyage	Text(50)
Service ID	The identifier of the Service	Number
Transport Journey ID	Identifies the Transport Journey	Text(50)

Table 64. Voyage entity

4.9 Party

In the Party subject area, there is currently only one entity – Carrier. This reference data entity captures all possible codes that uniquely define a carrier.

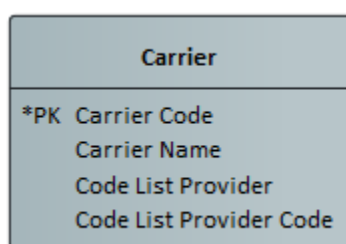


Figure 19. Party subject area

The related entity within the Party subject area is defined and detailed in Table 65.

Entity: Carrier		
Carrier means any person, organisation or government undertaking the transport of goods by any means of transport. The term includes both carriers for hire or reward (known as common or contract carriers in some countries) and carriers on own account (known as private carriers in some countries).		
Attribute	Definition	Datatype
Carrier Code	The Carrier Code represents a concatenation of the Code List Provider Code and the Code List Provider. A hyphen is used between the two codes. The unique carrier identifier is sourced from either the NMFTA SCAC codes list or the SMDG Liner Code List.	Text(10)
Code List Provider Code	The code provided for the Carrier by the code list provider.	Text(4)
Carrier Name	The name of the carrier.	Text(100)
Code List Provider	The organisation providing the code list, i.e. SMDG or NMFTA.	Text(8)

Table 65. Carrier entity

4.9.1 Party reference data and usage

The reference data for the Party subject area is focused on the carrier, as shown in the below Figure 20, and also provides some context as to where the carrier codes are needed. More details on each of the connected entities can be found in previous sections.

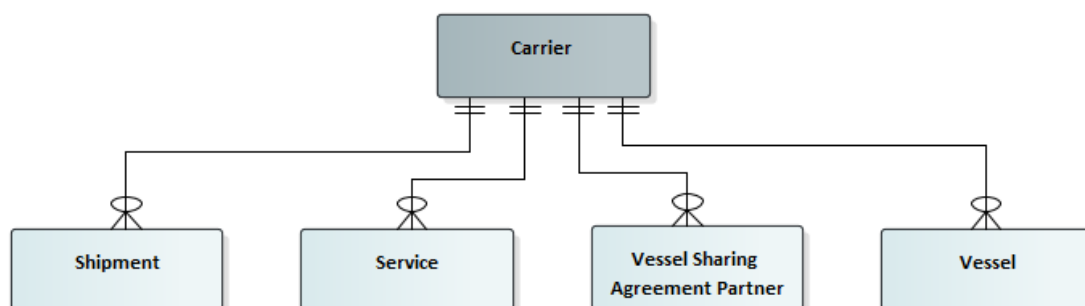


Figure 20. Party reference data entity

Table 66 contains examples of the unique Carrier Codes, Carrier Names and the carrier codes provided by the Code List Provider and the Code List Provider.

Carrier Code	Carrier Name	Code List Provider Code	Code List Provider
SMDG-CMA	CMA CGM	CMA	SMDG
SMDG-EMC	Evergreen Marine Corporation	EMC	SMDG
SMDG-HLC	Hapag Lloyd	HLC	SMDG
SMDG-HMM	Hyundai	HMM	SMDG
SMDG-MSK	Maersk	MSK	SMDG
SMDG-MSC	Mediterranean Shipping Company	MSC	SMDG
SMDG-ONE	Ocean Network Express Pte. Ltd.	ONE	SMDG
SMDG-YML	Yang Ming Line	YML	SMDG
SMDG-ZIM	Zim Israel Navigation Company	ZIM	SMDG

Table 66. Carrier examples

The Carrier entity has been designed to accommodate reference data from two separately maintained data sets: the SMDG Liner Code List (where the Code List Provider value will be set to “SMDG”) and the NMFTA SCAC code list (where the Code List Provider value will be set to “NMFTA”). In above, examples from the SMDG Liner Code List are shown. In order to enforce uniqueness, the codes provided by the SMDG and the NMFTA will be prefixed with the value in the Code List Provider attribute.

5 Logical Data Model Usage

5.1 The overall model

The DCSA Information Model 2.0 has been designed to act as a translator between the information requirements identified by the **business processes** mapped in the DCSA Industry Blueprint 2.0, and the existing standards for describing reference data relevant to the industry. The model has been built iteratively, with focus being given to certain parts of the model that are relevant to fulfil track and trace and operational vessel schedule interface requirements. Therefore, although the model as a whole has, and will continue to evolve over time, certain sections of the model will be more advanced than others. The aim of this section is to highlight the relevant parts of the model that have been developed for specific requirements.

The DCSA Information Model was originally constructed around the requirements for the ability to track and trace a shipment and has more recently undergone another iteration, to support an interface to share Operational Vessel Schedules (OVS) between VSA partners. Both areas will be described further in their own sections.

5.2 Track and trace

The entities that are needed to fulfil the requirements to be able to track and trace a shipment are shown in the figure below:

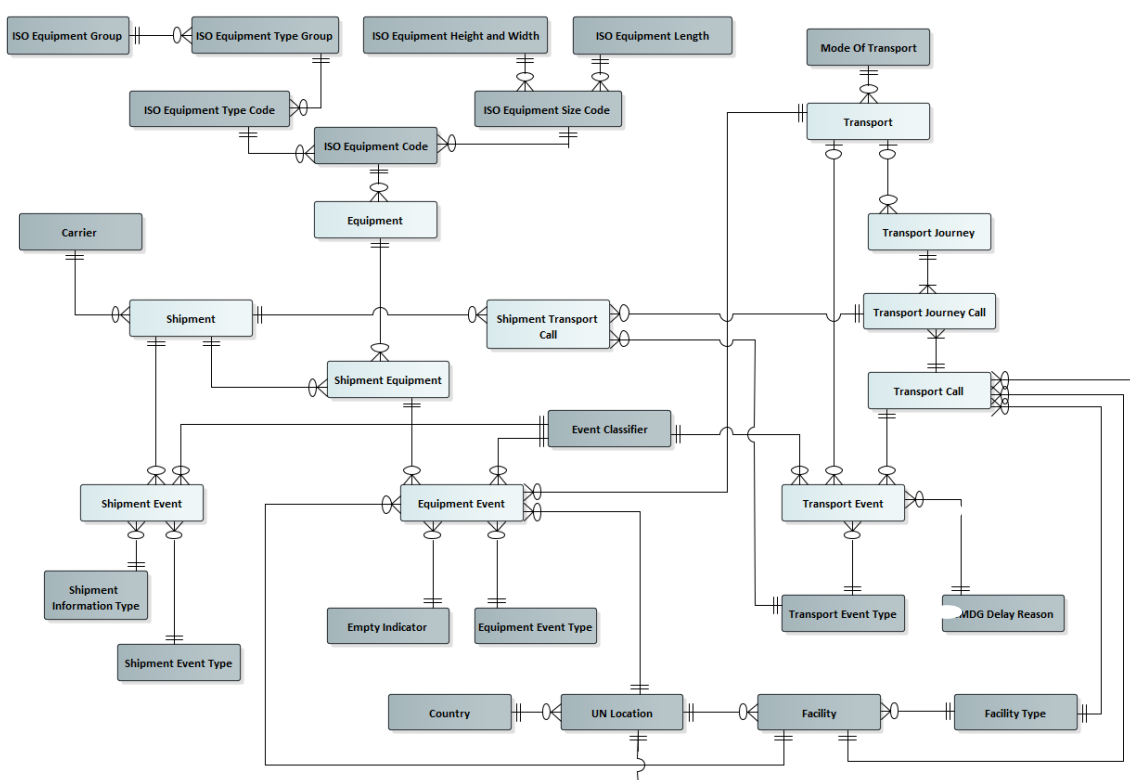


Figure 21. Logical Data Model for track and trace

The objective behind the use case of tracking and tracing a shipment is to identify the equipment and the transportation modes used for moving goods, rather than tracking and tracing the goods themselves or the contents of the equipment used in fulfilling the shipment.

The key entities are:

- Shipment – to uniquely identify the shipment that needs to be tracked and traced

- Equipment – which identifies the equipment(s) used to transport the goods belonging to the shipment
- Transport – which identifies which modes of transport (truck, rail, vessel or barge) are involved in the shipment
- The three Event (Transport/Shipment/Equipment) entities – ‘Shipment events’ describe actions that occurred or are planned to occur in relation to a booking or transport document, such as the issuance of the booking confirmation document. ‘Transport events’ describe the movements of the transport instances that are associated with the particular shipment or equipment item. ‘Equipment events’ describe the movements of an equipment item as part of the freight transportation. The previous sections in this document have outlined these elements.

For tracking and tracing, the **primary parties** are:

- The sender/receiver (shipper/consignee) of goods wanting to maintain information about the goods being transported. The details of these parties are stored in the Shipment entity.
- The main party contracting the movement of the goods, which, from DCSA’s point of view, is the ocean carrier. The Carrier entity stores the details of this party.

5.3 Operational vessel schedules (OVS)

The entities that are needed to fulfil the requirements of sharing operational vessel schedules are shown in the figure below:

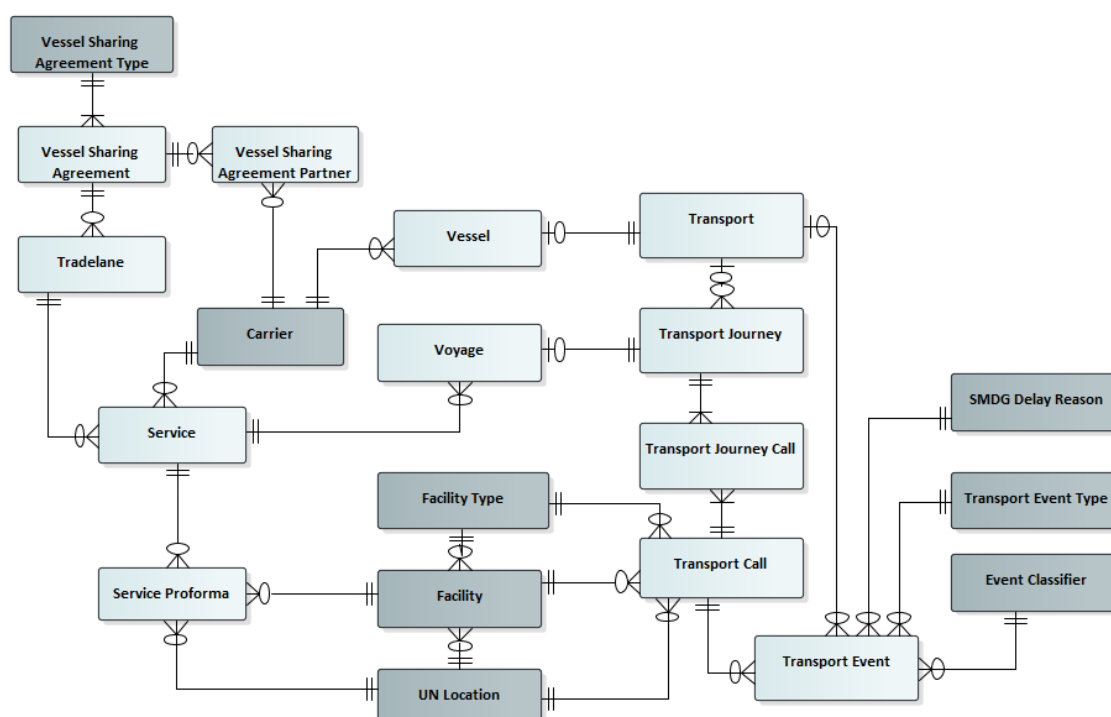


Figure 22. Logical Data Model for Operational Vessel Schedules

In addition to track and trace, the Logical Data Model (LDM) includes a standard of information relevant for operational vessel schedules. The focus is on container liner long-term and coastal schedules, i.e. schedules that have a named vessel assigned to them. Although proforma schedules are not covered by the current release, the LDM has modelled the Service and Service Proforma entities for completeness and additional context, with the expectation that these will be further developed in the future. Hence, the Service Proforma entity simply

represents the latest version of the proforma, not accounting for historical amendments. Likewise, VSAs have been modelled with minimal details to simply provide the context for how the operational vessel schedules are ultimately related to existing vessel sharing agreements.

The following are currently not in scope:

- Commercial schedules
- Feeder schedules
- Liner schedules that are not part of VSAs

The model for OVS revolves around vessel-related events. It mainly concerns the vessel operator (how is the shipment in practice transported from origin to destination). This customer-provider relationship is naturally expressed through products.

Products and their respective transport plans are currently not explicitly part of the information model, but appear through the Transport Call entity which, with the Transport Event entity, describe the details of how the shipment is routed through the liner network.

The OVS requirements heavily focus on the transport and transport journey subject areas. Although for the track and trace requirements, the generic transport entities were sufficient, OVS needs additional details which have been modelled as sub-type entities of Vessel and Voyage. The Transport Journey Call as an entity, was specifically included to deal with the scenario of overlapping voyages, i.e. where two voyages share the same transport calls.

6 Appendix

Bureau International des Containers et du Transport Intermodal (BIC) – Container Identification Number (2019):
<https://www.bic-code.org/identification-number/>

International Organisation for Standardisation (ISO) 6346:1995 – Freight containers -- Coding, identification and marking:
<https://www.iso.org/standard/20453.html>

International Maritime Organisation (IMO) – Identification number schemes (2019):
<http://www.imo.org/en/OurWork/MSAS/Pages/IMO-identification-number-scheme.aspx>

International Telecommunication Union (ITU) – Table of International Call Sign Series (Appendix 42 to the RR):
https://www.itu.int/en/ITU-R/terrestrial/fmd/Pages/call_sign_series.aspx

ISO 6346:1995 – Freight containers — Coding, identification and marking — Amendment 3:2012:
<https://www.iso.org/standard/59778.html>

National Motor Freight Traffic Association (NMFTA) - Standard Carrier Alpha Codes (SCAC) 2019:
<http://www.nmfta.org/pages/scac>

Republic of the Marshall Islands - Vessel Registration and Mortgage Recording Procedures (MI-100, 2018):
<https://www.register-iri.com/wp-content/uploads/MI-100.pdf>

Ship-planning Message Development Group (SMDG) – Terminal Code List, Liner Code List, Delay Reason Codes, and SMDG Recommendations:
<http://www.smdg.org/smdg-master-codes-lists/>
<http://www.smdg.org/documents/smdg-recommendations/>

United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Recommendation no. 19 (2000, first version):
https://www.unece.org/fileadmin/DAM/cefact/recommendations/rec19/rec19_ecetrd138.pdf

UN/CEFACT – UNLOCODE (2019):
<https://www.unece.org/cefact/locode/service/location.html>

UN/Trade Data Element Directory (TDED) (2005):
<https://www.unece.org/fileadmin/DAM/trade/untdd/UNTDED2005.pdf>

UN/CEFACT Core Component Library (CCL) (2019):
https://www.unece.org/cefact/codesfortrade/unccl/ccl_index.html

UN/Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT):
<https://www.unece.org/cefact/edifact/welcome.html>
and (accessed 2019)
<https://www.unece.org/tradewelcome/un-centre-for-trade-facilitation-and-e-business-unecefact/outputs/standards/unedifact/tradeedifactrules/part-4-edifact-rules-for-electronic-data-interchange-for-administration-commerce-and-transport/part-4-unedifact-rules-chapter-22-syntax-rules.html>

UN/CEFACT BUY/SHIP/PAY Reference Data Model (BSP RDM) (version 1, 2019)
https://www.unece.org/fileadmin/DAM/cefact/brs/BuyShipPay_BRS_v1.0.pdf

UN/CEFACT Multi-Modal Transport Reference Data Model (MMT RDM) (v1.0, 2018)
https://www.unece.org/cefact/brs/brs_index.html

