

# INFORMATION TECHNOLOGIES FOR SHIFT TO RAIL

## D3.7 Booking & Ticketing Ontology document (FREL)

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## **EXECUTIVE SUMMARY**

This document presents the part of IT2Rail ontology that concerns the Booking & Ticketing module. After a brief introduction, the document presents the ontology development process. Then, the ontology concepts are explained in detail, grouped by subjects (perspectives).

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	4
LIST OF FIGURES .....	7
1. INTRODUCTION.....	8
2. ONTOLOGY DEVELOPMENT PROCESS.....	9
3. INFRASTRUCTURE PERSPECTIVE.....	12
3.1 STOP PLACE.....	12
3.2 TOPOLOGY .....	12
4. TRAVEL PERSPECTIVE .....	13
4.1 DESTINATION .....	13
4.2 ORIGIN .....	13
4.3 ITINERARY .....	13
4.4 TRAVEL EPISODE .....	14
4.5 TRAVEL EPISODE END POINT .....	14
4.6 TRAVEL EPISODE START POINT .....	14
4.7 ARRIVAL DATE TIME.....	15
4.8 DEPARTURE DATE TIME .....	15
4.9 TRAVELLER PREFERENCES.....	15
4.10 VALIDATION TRANSACTION .....	16
5. COMMERCIAL PERSPECTIVE .....	17
5.1 AFTER SALES.....	17
5.2 ANCILLARY SERVICE.....	17
5.3 PRODUCT AVAILABILITY .....	18
5.4 PRODUCT AVAILABILITY LOCK.....	18
5.5 BOOKING .....	18
5.6 BOOKING ELEMENTS .....	19
5.7 GUARANTEED PRICE BOOKING .....	19
5.8 CONFIRMED BOOKING .....	19
5.9 PROOF OF PAYMENT .....	20
5.10 PAYMENT MEAN .....	20
5.11 PAYMENT DETAILS.....	20
5.12 EMBODIMENT.....	20
5.13 ENTITLEMENT .....	21
5.14 FARE PRODUCT .....	21
5.15 FARE RULE .....	21
5.16 ITINERARY OFFER.....	22

5.17	ITINERARY OFFER ITEM .....	22
5.18	PASSENGER .....	22
5.19	PRICE .....	23
5.20	OFFER ITEM PRICE .....	23
5.21	OFFER ITEM PRICE ITEM.....	23
5.22	PRODUCT.....	24
5.23	TOKEN.....	24
6.	ROLES PERSPECTIVE .....	25
6.1	BOOKING PROVIDER.....	25
6.2	CUSTOMER .....	25
6.3	TRAVELLER.....	26
6.4	TRANSPORT SERVICE PROVIDER .....	26
6.5	RETAILER .....	27
7.	SERVICES PERSPECTIVE .....	28
7.1	ACCESS SYSTEM.....	28
7.2	INSPECTION DEVICE .....	28
8.	ABBREVIATIONS .....	29

## LIST OF FIGURES

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Figure 1: Proposed procedure .....	9
Figure 2: Annotation Concept for Word Document .....	11
Figure 3: Stylesheet for remaining text elements .....	11

## 1. INTRODUCTION

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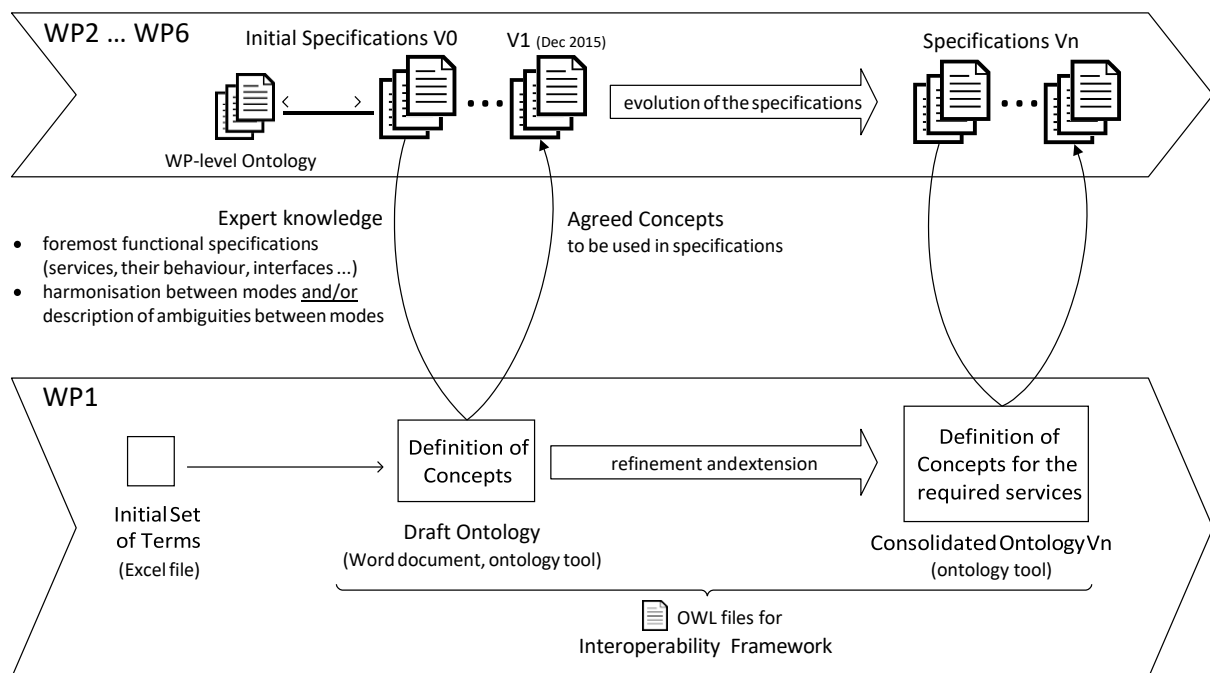
This document presents the fragment of the IT2Rail ontology that concerns Travel Booking & Ticketing (BT) module. In more detail, the BT ontology introduces the concepts necessary to describe and semantically annotate the data that the BT module receives and exports from and towards the other IT2Rail functional areas and the external world.

The document describes in Section 2 the ontology development process. The following sections provide a formal description of the concepts included in the ontology, grouped by perspective: Infrastructure, Travel, Commercial, Roles and Service.



## 2. ONTOLOGY DEVELOPMENT PROCESS

The following diagram illustrates an iterative ontology development process designed to coordinate and control the development of Specifications developed in Travel Shopping functional area (WP2) to Business Analytics functional area (WP6) with the ontology engineering activities in the Interoperability Framework functional area (WP1).



**Figure 1: Proposed procedure**

Within each functional area, the Ontology and Specification activities must be tightly coupled: the Ontology task should identify concepts needed or handled by the Specifications, particularly the interface specifications, and the Specifications task should use terms defined by Ontology task. The result of both activities is the functional area Specifications document. An important aspect of the identification of concepts at functional area level is the need to harmonize them across transportation modes: when this is not possible, i.e. no common abstraction can be found, differences or ambiguities must be explicitly described.

Specifications documents from the functional areas are used by Interoperability Framework to infer the common/shared ontology, and to refine and extend it generating additional input, i.e. concepts and relationship to the subsequent versions of the functional area Specifications.

In the following section, a methodology based upon table templates shall be used to work out all the concepts required. Emphasis shall be put on those concepts that describe interfaces between components. Each table is structured alike and consists of a table header harboring structural information and a table body representing the concept description.

Concepts are grouped by “perspective”, i.e. Infrastructure, Operations, Travel, Commercial, described in the chapter of each perspective chapter of this document.

We note that the grouping is not by work package, as in general each work package will use concepts from all perspectives at the interfaces. The organization by perspective is necessary to formalize concepts unambiguously, i.e. amenable to automation in Interoperability Framework services.

Each individual concept table contains a ‘header’ with the following metadata:

#### Header

**KEYWORD:** A chosen keyword shall be agreed between involved partners. Keyword uniqueness is not required in case the same keyword represents different concepts in distinct domains.

**DOMAIN:** The domain in which the current concept exists.

**SIMILAR TO:** In this field keywords of other concepts shall be enumerated which are in some respect similar but not necessarily identical.

**RELATED TO:** In this field keywords of other concepts shall be enumerated which bear arbitrary relations to the concept in focus.

**COMMENT:** This field shall be used to annotate the current status of the concept (draft or agreed) in the very beginning. In addition any Information that does not add to the concept itself but may be relevant for reference shall be put in this field. (e.g. “This keyword is drawn from standard ...”).

**RESPONSIBLE:** Field containing a list of abbreviations of persons, organizations or workgroups responsible for this concept. The abbreviations shall be introduced in section 8.

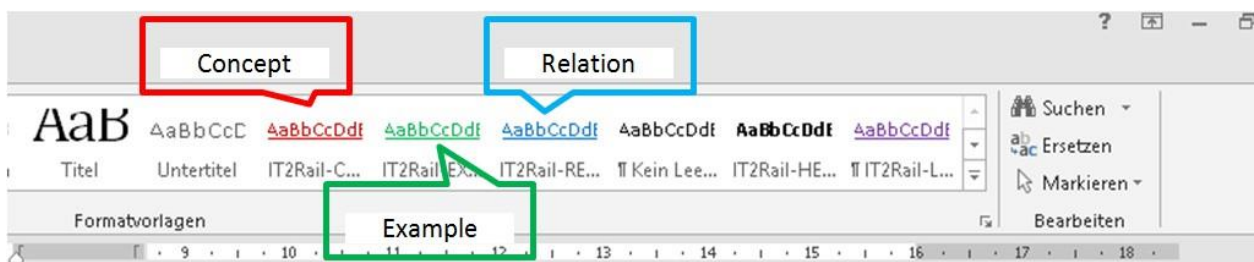
If the concept in focus is known to be a service, the contents of the table body slightly differ. Otherwise Concepts and Services are considered to be similar to the purpose of the tables. For example, on how completed tables may look like in the case of a service, please refer to the “Access System” in section 7. The free text ‘body’ of each table should be filled in with the following information:

#### Body

For Concepts	For Services
<ul style="list-style-type: none"> <li><i>Self-description:</i> What is it?</li> <li><i>Who employs it, what for, in which context?:</i> Who/What are the Actors? How do they interact?</li> <li><i>Where does it originate from, how long is it valid?:</i> Description of its Lifecycle.</li> <li><i>Additional Notes:</i> Any further information which may turn out to be</li> </ul>	<ul style="list-style-type: none"> <li><i>Self-description:</i> What does it do?</li> <li><i>Input to the Service, pre-conditions:</i> What does the Service need to be functional?</li> <li><i>Other actors to invoke:</i> Which other Service might need to be called to generate an answer?</li> <li><i>Who requests it:</i> Who will probably call</li> </ul>

<p>relevant but does not fit in the above fields.</p> <ul style="list-style-type: none"> <li>• <i>Example</i></li> </ul>	<p>the Service and what output will be expected?</p> <ul style="list-style-type: none"> <li>• (Of which subservices is it composed?)</li> <li>• <i>Additional Notes:</i> Any further information which may turn out to be relevant but does not fit in the above fields.</li> <li>• Examples</li> </ul>
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Inside the table body (Word) stylesheets (as shown below, concept in red, Relation in blue and Example in green) shall be employed to reference additional Concepts, Relation and Examples. Those stylesheets are already included in the document (see Illustration 2). For an example on how an annotated table body may look like please refer to “Access System” in section 7.



### Figure 2: Annotation Concept for Word Document

Any textual elements that are neither Concepts and Relation nor Examples shall have a plain stylesheet applied e.g. “IT2Rail-Text” as displayed in Illustration 3.



### Figure 3: Stylesheet for remaining text elements

The following sections are ordered to represent different perspectives (Infrastructure, Travel, Commercial).

### 3. INFRASTRUCTURE PERSPECTIVE

This chapter groups concepts and/or services related to the infrastructure, i.e. the physical and/or logical organization of the transportation network, as it exists regardless of the actual operation of transportation services over it. It describes an infrastructure on which there are vehicles running. Infrastructures may be different by mode, e.g. an airport is different from a bus station.

#### 3.1 STOP PLACE

<b>KEYWORD</b>	StopPlace
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	<a href="#">TransportInfrastructure</a> , <a href="#">Vehicle</a> , <a href="#">Traveller</a> , <a href="#">Location</a> , <a href="#">Quay</a> , <a href="#">VehicleStoppingPlace</a> , <a href="#">LocationCode</a> , <a href="#">RouteLink</a> , <a href="#">TransportMode</a> , <a href="#">StopPlace</a> , <a href="#">AirTransport</a> , <a href="#">BusTransport</a> , <a href="#">CoachTransport</a> , <a href="#">RailTransport</a> , <a href="#">Airport</a> , <a href="#">BusStation</a> , <a href="#">CoachStation</a> , <a href="#">RailStation</a> , <a href="#">Terminal</a> , <a href="#">Topology</a> , <a href="#">LocationCode</a> , <a href="#">Hub</a> , <a href="#">TravelEpisodeStartPoint</a> , <a href="#">TravelEpisodeEndPoint</a> , <a href="#">OpenProduct</a> , <a href="#">Equipment</a>
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><a href="#">Is an element of</a> the <a href="#">TransportInfrastructure</a> where <a href="#">Vehicle(s)</a> <a href="#">may stop</a> and where <a href="#">Traveller(s)</a> <a href="#">may board or leave Vehicle(s)</a>.</p> <p><i>Additional Notes:</i> A <a href="#">StopPlace</a> <a href="#">has</a> one or more <a href="#">Quay(s)</a> and <a href="#">has</a> one or more <a href="#">VehicleStoppingPlace(s)</a>. A <a href="#">StopPlace</a> <a href="#">is located at a Location</a> and <a href="#">has</a> a <a href="#">Name</a> and <a href="#">has</a> one or more <a href="#">LocationCode(s)</a>. A <a href="#">StopPlace</a> <a href="#">is connected by RouteLink(s) to</a> one or more other <a href="#">StopPlace(s)</a> <a href="#">at the level of VehicleStoppingPlace(s)</a>. A <a href="#">StopPlace</a> <a href="#">may be qualified by TransportMode</a>. <a href="#">StopPlace(s)</a> <a href="#">can be organized</a> in a structural hierarchy. A <a href="#">StopPlace</a> <a href="#">can be composed of StopPlace(s)</a>. For example, <a href="#">London Heathrow</a> is a <a href="#">StopPlace</a>, <a href="#">Terminal 5</a> of London Heathrow is a child <a href="#">StopPlace</a> of London Heathrow.</p>	
The definition is based on IFOPT.	

#### 3.2 TOPOLOGY

<b>KEYWORD</b>	Topology
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	<a href="#">RouteLink</a> , <a href="#">StopPlace</a> , <a href="#">TransportInfrastructure</a>
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
The way in which constituent parts are interrelated or arranged.	
<i>Additional Notes:</i> A Topology can have a physical and logical representation.	

## 4. TRAVEL PERSPECTIVE

This perspective describes concepts and/or services related to people in a travel instance realized through the use of travel related services over an infrastructure, i.e. regardless of mode of transportation.

### 4.1 DESTINATION

<b>KEYWORD</b>	Destination
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Itinerary, TravelEpisodeEndPoint, TravelEpisode, Traveller, Trip, Multimodal, JourneyPlanner
<b>COMMENT</b>	(draft/agreed)
<b>RESPONSIBLE</b>	
Is the <a href="#">TravelEpisodeEndPoint</a> of the last <a href="#">TravelEpisode</a> of the <a href="#">Traveller's Itinerary</a> .	
<i>Additional Notes:</i> For example, <a href="#">Musée d'Orsay</a> , <a href="#">Paris Gare de Lyon</a> , <a href="#">via Focilide 29 Roma</a> , are <a href="#">Destination(s)</a> .	

### 4.2 ORIGIN

<b>KEYWORD</b>	Origin
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Itinerary, TravelEpisodeStartPoint, TravelEpisode, Traveller, Trip, Multimodal, JourneyPlanner
<b>COMMENT</b>	(draft/agreed)
<b>RESPONSIBLE</b>	
Is the <a href="#">TravelEpisodeStartPoint</a> of the first <a href="#">TravelEpisode</a> of the <a href="#">Traveller's Itinerary</a> .	
<i>Additional Notes:</i> For example, <a href="#">Wembley Stadium</a> , <a href="#">Waterloo Station</a> , <a href="#">3 Abbey Road London</a> , are <a href="#">Origin(s)</a> .	

### 4.3 ITINERARY

<b>KEYWORD</b>	Itinerary
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Origin, Destination, Journey, PointOfViewing, MobilityRequest, StopOver, Trip, Comodal, Monomodal, Multimodal, Intermodal, ItineraryOffer, TravelCompanionApplication, TravellerWallet, CustomerWallet
<b>COMMENT</b>	(draft/agreed)
<b>RESPONSIBLE</b>	
Is a <a href="#">sequence</a> of consecutive <a href="#">Journey(s)</a> . It is also a <a href="#">sequence</a> of consecutive <a href="#">TravelEpisode(s)</a> .	
<i>Additional Notes:</i> An <a href="#">Itinerary</a> has an <a href="#">Origin</a> and has a <a href="#">Destination</a> .	

## 4.4 TRAVEL EPISODE

<b>KEYWORD</b>	TravelEpisode
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Traveller, Vehicle, VehicleStoppingPlace, TravelEpisodeStartPoint, TravelEpisodeEndPoint, Arrival, Departure, Origin, Destination, Itinerary, Journey, Segment, BaggageAllowance, ProductConsumption, DisruptiveTransportEvent, Travel
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is the representation of</u> the movement of the <u>Traveller</u> between two <u>TravelEpisodeEndPoint(s)</u> (<u>respectively start and end</u>).</p> <p><u>Is the movement of</u> the <u>Traveller</u> which is experienced as homogeneous in the sense that the <u>Traveller is using either one and the same</u> commercial <u>Vehicle throughout</u> the <u>TravelEpisode</u> or a non-commercial way to cover a distance such as walking or cycling.</p> <p><i>Additional Notes:</i> It also <u>may include</u> the transfer of the <u>Traveller to and from</u> a <u>VehicleStoppingPlace</u> if this is mandatory to the <u>Traveller</u> and <u>cannot be influenced</u> in any way <u>by</u> the <u>Traveller</u> himself. An Example is the bus transfer from the apron position of a plane to the <u>BoardingGate</u>. In contrast, using a sky train to <u>Travel</u> between two airport terminals is a <u>TravelEpisode</u> on its own, as the <u>Traveller</u> can decide whether to use a sky train or e.g. to walk to cover the distance. A <u>TravelEpisode</u> <u>has</u> a <u>TravelEpisodeStartPoint</u> which <u>marks the beginning of</u> a <u>TravelEpisode</u> and <u>has</u> a <u>TravelEpisodeEndPoint</u> which <u>marks the end of</u> a <u>TravelEpisode</u>.</p>	

## 4.5 TRAVEL EPISODE END POINT

<b>KEYWORD</b>	TravelEpisodeEndPoint
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	TravelEpisode, POI, StopPlace, VehicleStoppingPlace, Arrival, Destination, StopOver
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is the spatial end of</u> a <u>TravelEpisode</u>.</p> <p><i>Additional Notes:</i> A <u>TravelEpisodeEndPoint</u> <u>can be</u> a <u>StopPlace or any other Location at which</u> a <u>TravelEpisode ends</u>.</p>	

## 4.6 TRAVEL EPISODE START POINT

<b>KEYWORD</b>	TravelEpisodeStartPoint
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	TravelEpisode, POI, StopPlace, VehicleStoppingPlace, Departure, Origin
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is the spatial beginning of</u> a <u>TravelEpisode</u>.</p> <p><i>Additional Notes:</i> A <u>TravelEpisodeStartPoint</u> <u>can be</u> a <u>StopPlace or any other Location at which</u> a <u>TravelEpisode starts</u>.</p>	

## 4.7 ARRIVAL DATE TIME

<b>KEYWORD</b>	ArrivalDatetime
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Arrival, OpenProduct
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<a href="#">Are the date and time values associated</a> with the <a href="#">Arrival</a> (as <a href="#">TravelEpisodeEndPoint</a> ).	
<i>Additional Notes:</i>	

## 4.8 DEPARTURE DATE TIME

<b>KEYWORD</b>	DepartureDatetime
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Departure, OpenProduct, BookingTimeLimit
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<a href="#">Are the date and time values associated</a> with the <a href="#">Departure</a> (as <a href="#">TravelEpisodeStartPoint</a> ).	
<i>Additional Notes:</i>	

## 4.9 TRAVELLER PREFERENCES

<b>KEYWORD</b>	TravellerPreferences
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Traveller, Service, Good, LoyaltyProgram, PRM, TransportServiceProvider, TransportMode, AncillaryService, Passenger, TravellerWallet, CustomerWallet, TravelServiceProvider
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<a href="#">Is</a> the <a href="#">Traveller</a> -related information that represents its travel-related needs and choices.	
<i>Additional Notes:</i> <a href="#">Service</a> (s) and <a href="#">Good</a> (s) which <a href="#">are offered to</a> the <a href="#">Traveller</a> , <a href="#">should correspond to</a> its <a href="#">TravellerPreferences</a> . <a href="#">TravellerPreferences can comprise</a> the participation in a <a href="#">LoyaltyProgram</a> , being a <a href="#">PRM</a> , the preferred <a href="#">TransportServiceProvider</a> , the preferred <a href="#">TransportMode</a> among others, the location of a seat, meal preferences...	

## 4.10 VALIDATION TRANSACTION

<b>KEYWORD</b>	ValidationTransaction
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Token, AccessSystem
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><a href="#">Is</a> the data describing a <a href="#">Token</a> alteration by an <a href="#">AccessSystem</a> at a date and time.</p> <p><a href="#">Guarantees</a> non-repudiation.</p> <p><i>Additional Notes:</i> A ValidationTransaction is emitted at validation time by the action of the AccessSystem and the Token/embodiment. It can be used as a proof of passage for the Traveller or the ticketing system.</p>	



## 5. COMMERCIAL PERSPECTIVE

This perspective describes concept and/or services related to the commercial aspects of travel, i.e. how services and products are searched, selected, purchased, paid for, etc.

### 5.1 AFTER SALES

<b>KEYWORD</b>	AfterSales
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	Post-sales processes
<b>RELATED TO</b>	Entitlement, Cancellation
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is a collection of</u> business processes that <u>can only be performed on</u> issued <u>Entitlement</u>(s).</p> <p><i>Additional Notes:</i> <u>AfterSales can include Cancellation</u>, exchange, modification, revalidation among other business processes (for example re-routing and compensation).</p>	

### 5.2 ANCILLARY SERVICE

<b>KEYWORD</b>	AncillaryService
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Service, Product, Traveller, TravellerPreferences, Reservation, Organisation, TransportServiceProvider, ProductOwner, BaggageAllowance, TravelClass, ServiceProvider
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><u>Is a Service enhancing the value of</u> a <u>Product</u> and therefore <u>cannot be purchased without reference to</u> such a <u>Product</u>.</p> <p><i>Additional Notes:</i> <u>AncillaryService(s) are proposed</u> for the use by the <u>Traveller</u>. The usage of <u>AncillaryService(s)</u> <u>can depend on TravellerPreferences</u>. <u>AncillaryService(s) can contribute</u> to make the travel experience tailored to the <u>Traveller</u>. Examples of <u>AncillaryService(s)</u> are <u>on-board meals</u>, <u>special assistance</u>, <u>Wi-Fi</u> among others. A <u>Reservation may also be modelled and sold as</u> an <u>AncillaryService</u>. <u>AncillaryService(s) may be supplied by</u> a different <u>Organisation</u> than the <u>TransportServiceProvider</u>. The binding business rules are owned by the <u>ProductOwner</u>.</p>	

## 5.3 PRODUCT AVAILABILITY

<b>KEYWORD</b>	ProductAvailability
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Product, Booking, Facility, Vehicle, UnlimitedSupplyProduct, UrbanTransport, ProductAvailabilityLock, ProductAvailabilityRequest, Booking, LimitedSupplyProduct, Offer
<b>COMMENT</b>	(draft/agreed)
<b>RESPONSIBLE</b>	
<p><u>Is</u> the disposable supply of a <u>Product computed</u> at a certain stage <u>during Booking</u>.</p> <p><i>Additional Notes:</i> <u>ProductAvailability can be constrained</u> for example due to physical limitations of <u>Facility(ies)</u> <u>in</u> a <u>Vehicle</u>, due to time-related or other limitations. For example, only a certain amount of business class seats is available for a specific flight, which implies that only a certain amount of business class tickets can be sold for this flight. However, <u>ProductAvailability is assumed as unconstrained</u> for <u>UnlimitedSupplyProduct(s)</u> such as for <u>Product(s) related to UrbanTransport</u>. For example, the places in a metro are assumed as unconstrained and their availability is not a prerequisite for the selling of such <u>Product(s)</u>.</p>	

## 5.4 PRODUCT AVAILABILITY LOCK

<b>KEYWORD</b>	ProductAvailabilityLock
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	ProductAvailability, Customer, ConfirmedBooking
<b>COMMENT</b>	(draft/agreed)
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><u>Is</u> the temporary holding of <u>ProductAvailability</u>.</p> <p><i>Additional Notes:</i> A <u>ProductAvailabilityLock allows</u> the <u>Customer</u> to complete other necessary steps prior to a <u>ConfirmedBooking</u>.</p>	

## 5.5 BOOKING

<b>KEYWORD</b>	Booking
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Offer, Customer, ProductRetailer, Product, ProductAvailability, AirTransport, BookingProvider, ConfirmedBooking, BookingClass, BookingTimeLimit, Offer, Reservation, BookingProviderReference, BookingReference, Customer, SeatNumber
<b>COMMENT</b>	(draft/agreed)
<b>RESPONSIBLE</b>	
<p><u>Is</u> the business process of <u>selecting</u> an <u>Offer by</u> the <u>Customer</u> for purchase and recording the subsequent <u>agreement by</u> the <u>TransportServiceProvider to provide</u> the <u>Product(s)</u> described in the <u>Offer</u>.</p> <p><i>Additional Notes:</i> <u>Checking ProductAvailability</u> and <u>obtaining available Offer(s)</u> <u>are a prerequisite for</u> a successful <u>Booking</u>.</p>	

## 5.6 BOOKING ELEMENTS

<b>KEYWORD</b>	BookingElements
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Booking, ItineraryOfferItem
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is</u> a set of records linking a <u>Booking</u> with each <u>ItineraryOfferItem</u> for availability. Each record of <u>BookingElements</u> <u>has</u> a BookingStatus property.</p> <p><i>Additional Notes:</i> The <u>BookingElements</u> are all the data needed to identify the <u>FareProduct</u>(s) to be booked and linked to a <u>Passenger</u>.</p>	

## 5.7 GUARANTEED PRICE BOOKING

<b>KEYWORD</b>	GuaranteedPriceBooking
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Booking, Offer, Customer, ProductRetailer, Product, ProductAvailability, AirTransport, BookingProvider, ConfirmedBooking, BookingClass, BookingTimeLimit, Offer, Reservation, BookingProviderReference, BookingReference, Customer, SeatNumber
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is</u> a Booking where all booked <u>ItineraryOfferItem(s)</u>'s <u>OfferItemPrice(s)</u> are guaranteed by the <u>ItineraryOfferItem(s)</u> provider.</p> <p><i>Additional Notes:</i></p>	

## 5.8 CONFIRMED BOOKING

<b>KEYWORD</b>	ConfirmedBooking
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Booking, Customer, ProofOfPayment, Entitlement, Product, ProductAvailabilityLock
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is</u> a completed <u>Booking</u> due to the fact that the <u>Customer</u> <u>has submitted</u> a <u>ProofOfPayment</u>.</p> <p><i>Additional Notes:</i> A <u>ConfirmedBooking</u> <u>is</u> a necessary condition for <u>issuing Entitlement(s)</u> for the associated <u>Product(s)</u> on these <u>TravelEpisode(s)</u>. A <u>ConfirmedBooking</u> <u>does not authorise actual</u> consumption <u>of the</u></p>	

## 5.9 PROOF OF PAYMENT

KEYWORD	ProofOfPayment
DOMAIN	
SIMILAR TO	
RELATED TO	Paying, ConfirmedBooking
COMMENT	(draft/ <u>agreed</u> )
RESPONSIBLE	
<u>Is an evidence that Paying has already been made or will be made in the future.</u>	
Additional Notes:	

## 5.10 PAYMENT MEAN

KEYWORD	PaymentMean
DOMAIN	
SIMILAR TO	
RELATED TO	PaymentDetails, Paying, ConfirmedBooking
COMMENT	(draft/ <u>agreed</u> )
RESPONSIBLE	
<u>Is the description of a mean that can be used to perform Paying.</u>	
Additional Notes:	

## 5.11 PAYMENT DETAILS

KEYWORD	PaymentDetails
DOMAIN	
SIMILAR TO	
RELATED TO	PaymentMeans, Paying, ConfirmedBooking
COMMENT	(draft/ <u>agreed</u> )
RESPONSIBLE	
<u>Is the detailed data that can be used to perform the payment process depending on the PaymentMean(s).</u>	
Additional Notes: In Transmodel V5.1 the PaymentDetails correspond to SALE TRANSACTION.	

## 5.12 EMBODIMENT

KEYWORD	Embodiment
DOMAIN	
SIMILAR TO	Synonym: FareMedium
RELATED TO	PhysicalMedium, Token, Entitlement, AccessSystem, InspectionDevice, Ticket, Validation, ProductOwner, ContactlessSmartCard, SmartDevice, Tapping
COMMENT	(draft/ <u>agreed</u> )
RESPONSIBLE	Functional area Booking & Ticketing (WP3)
<u>Is a PhysicalMedium containing one or more Token(s) associated with the same or different Entitlement(s) and which is compatible with the AccessSystem(s) and InspectionDevice(s) that are using the Embodiment's Token(s).</u>	
Additional Notes: Examples are <u>paper tickets</u> , <u>magnetic-stripe tickets</u> , <u>chip cards</u> , <u>smartphones</u> . There <u>can be</u> more than one <u>Embodiment</u> containing <u>Token(s)</u> from the same <u>Entitlement</u> .	

## 5.13 ENTITLEMENT

<b>KEYWORD</b>	Entitlement
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Traveller, Traveling, Segment, Customer, Cancelling, Contract, Product, Good, TransportServiceProvider, AfterSales, Comodal, Intermodal, Embodiment, Inspection, ProductConsumption, ThroughFare, Ticket, Token, Validation, ProductOwner, TravellerWallet, CustomerWallet, EntitlementNumber, TicketTimeLimit
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><u>Is</u> the set of the rights, duties and liabilities which are legally binding the parties.</p> <p>Is an electronic representation linked to a TravelOffer involving an Offer Provider and one or more <u>Traveller(s)</u> <u>necessary for Travelling</u> on <u>TravelEpisode(s)</u></p> <p><i>Additional Notes:</i> An <u>Entitlement is created</u> out of a <u>Product offered on</u> these <u>TravelEpisode(s)</u>. For certain purchased <u>Product(s)</u> exactly one <u>Entitlement is issued</u>. Some rights, duties and liabilities are granted contractually by the <u>TransportServiceProvider</u>. It is the contract associated with a travel offer accepted by both the TravelServiceProvider and the customer.</p> <p>In Transmodel V5.1 the Entitlement concept correspond to the PASSENGER CONTRACT.</p>	

## 5.14 FARE PRODUCT

<b>KEYWORD</b>	FareProduct
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	FareRule, Name, Token
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p><u>Is a set of</u> <u>FareRule(s)</u> and parameter(s) which are applied together.</p> <p><u>Allows the use of</u> a <u>TransportService</u>.</p> <p><u>Is instantiated in</u> a <u>Token</u> when issued.</p> <p><i>Additional Notes:</i> A <u>FareProduct has</u> a <u>Name</u>. Example: a <u>multiride</u>, a <u>city pass</u></p>	

## 5.15 FARE RULE

<b>KEYWORD</b>	FareRule
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Price, Product, Segment, UrbanTransport, FareType
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><u>Is</u> a description of how to compute the <u>Price</u>, validity and consumption of a <u>Product offered on</u> a <u>TravelEpisode</u>.</p> <p><i>Additional Notes:</i></p>	

## 5.16 ITINERARY OFFER

<b>KEYWORD</b>	ItineraryOffer
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	Synonym: Travel Solutions, TravelOffer
<b>RELATED TO</b>	Offer, Itinerary
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<i>Is an <u>Offer for a specific Itinerary</u>. Is composed of Itinerary offer item(s).</i>	
<i>Additional Notes: An <u>ItineraryOffer</u> can be an aggregation of <u>Offer</u>(s).</i>	

## 5.17 ITINERARY OFFER ITEM

<b>KEYWORD</b>	ItineraryOfferItem
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	ItineraryOffer
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<i>Is an element of an <u>ItineraryOffer</u> describing a specific offer to Passengers of Products on TravelEpisode(s) (including Start Point and/or End point only) in a specific shopping process instance.</i>	
<i>Additional Notes: Associative class representing a 3-way relation of - one or more Products - one or more Travel Episodes - one or more Passengers with the meaning that the specified Products are offered on the specified TravelEpisodes to the specified Passengers for a single OfferItem Price, a single set of Sales Conditions and After Sales Conditions under a set of accepted payment modes. In Transmodel V5.1, itinerary offer item could correspond to SALES PACKAGE with ConditionSummary and ValidityParameterAssignment with additional information related to passengers that can be matched with CUSTOMER.</i>	

## 5.18 PASSENGER

<b>KEYWORD</b>	Passenger
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Traveller, Vehicle, TravellerProfile, TravellerPreferences, ContractOfCarriage, Reservation, Facility, SeatNumber
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<i>Is a <u>Traveller riding on-board</u> a <u>Vehicle</u>.</i>	
<i>Additional Notes:</i>	

## 5.19 PRICE

<b>KEYWORD</b>	Price
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	Synonym: , OfferItemPrice
<b>RELATED TO</b>	Product, FareRule, Offer, Pricing
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<i>Is</i> the monetary value for a <b>Product</b> .	
<i>Additional Notes:</i> A <b>Price</b> may include taxes, fees and other debited or credited amounts.	

## 5.20 OFFER ITEM PRICE

<b>KEYWORD</b>	OfferItemPrice
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	Synonym: Price
<b>RELATED TO</b>	Product, FareRule, Offer, Pricing, OfferItemPriceItem
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<i>Is</i> the price of an <b>ItinerartOfferItem</b> charged for its purchase. <i>Is composed of</i> <b>OfferItemPriceItem(s)</b>	
<i>Additional Notes:</i> In Transmodel V5.1 the OfferItemPrice concept corresponds to the list of SalesPackagePrice.	

## 5.21 OFFER ITEM PRICE ITEM

<b>KEYWORD</b>	OfferItemPriceItem
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Product, FareRule, Offer, Pricing, OfferItemPrice
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<i>Is</i> an element of an <b>OfferItemPrice</b> charged for its purchase.	
<i>Additional Notes:</i> In Transmodel V5.1 the OfferItemPrice concept corresponds to SalesPackagePrice.	

## 5.22 PRODUCT

<b>KEYWORD</b>	Product
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Service, Good, Segment, AncillaryService, ProductAvailability, Booking, ConfirmedBooking, Entitlement, FareRule, InterlineProduct, LoyaltyProgram, LimitedSupplyProduct, UnlimitedSupplyProduct, Offer, OpenProduct, Price, Paying, Reservation, ThroughFare, MarketingCarrier, ProductOwner, ProductRetailer, TravelServiceProvider
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><u>Is</u> a travel-related, purchasable <u>Service</u> or <u>Good</u> comprising a sound set of pricing rules, usage rules and commercial rules.</p> <p><i>Additional Notes:</i> A <u>Product can be derived from</u> a combination or enrichment of other <u>Product</u>(s). A product comprises a sound set of pricing rules, usage rules and commercial rules.</p>	

## 5.23 TOKEN

<b>KEYWORD</b>	Token
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Entitlement, Organisation, Authentication, Embodiment, ProductConsumption, Ticket, Validation, TravelCompanionApplication, TravellerWallet, 2DBarcode, Barcode, CustomerWallet
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<p><u>Is a subset of</u> an <u>Entitlement</u>'s information set and <u>is generated and used by</u> an <u>Organisation</u> for its own purposes in the business processes in which this <u>Organisation</u> is participating (in particular <u>Validation</u>).</p> <p><i>Additional Notes:</i> A <u>Token is</u> a specific translation of an <u>Entitlement</u> and has usually a proprietary encoding.</p>	



## 6. ROLES PERSPECTIVE

### 6.1 BOOKING PROVIDER

<b>KEYWORD</b>	BookingProvider
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	ProductRetailer, AirTransport, Booking, BookingTimeLimit, Reservation, BookingProviderReference
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
Is an <u>organisation</u> providing <u>booking</u> services.	
<i>Additional Notes:</i> An example is <u>Amadeus</u> .	

### 6.2 CUSTOMER

<b>KEYWORD</b>	Customer
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Actor, Contract, TransportServiceProvider, Shopping, Booking, Paying, Cancellation, Product, Traveller, ProductAvailabilityLock, CustomerPreferences, ConfirmedBooking, Comodal, Intermodal, Entitlement, LoyaltyProgram, Offer, Refunding, ProductRetailer, TravelCompanionApplication, TravellerWallet, CustomerWallet
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
Is an <u>Actor</u> that <u>enters into</u> a <u>Contract</u> with a TransportServiceProvider.	
<i>Additional Notes:</i> The <u>Customer is involved in Shopping, Booking, Paying, Cancellation</u> among other business processes. The <u>Customer can buy Product(s)</u> in the name of and for the benefit of the <u>Traveller</u> . The <u>Customer can be the Traveller</u> .	
<p>The customer can have different roles at different moments according to the process in which he is involved. E.g.:</p> <ul style="list-style-type: none"> <li>- The customer is a buyer when he buy products in a distribution process</li> <li>- The customer is a payer when his mean of payment is used in a distribution process</li> <li>- The customer is a Traveller when he uses a transportation mean thanks to entitlements</li> <li>- The customer is a contact when he calls a call center or receives a message in a marketing campaign</li> <li>- The customer is a offender when he does not respect the terms and conditions of a service</li> <li>- The customer is a passenger when transported on a vehicle</li> <li>- The customer should always be a client when the actors involved in his travel are requested for help</li> <li>- The customer is a victim when he/she is harmed in a travel accident or travel disruption...</li> </ul>	

## 6.3 TRAVELLER

<b>KEYWORD</b>	Traveller
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Person, Travel, Individual, PointOfInterest, StopPlace, TransportInfrastructure, PointOfViewing, Connection, LineNumber, VehicleStoppingPlace, Arrival, Departure, Origin, Destination, MobilityRequest, Scenery, TravelEpisode, TravellerPreferences, AncillaryService, BaggageAllowance, LoyaltyMedium, LoyaltyCode, Entitlement, Inspection, OpenProduct, Passenger, TravellerProfile, ThroughFare, Validation, TravelCompanionApplication, TravellerWallet, TravellerContext, DisruptiveTransportEvent, RecoveryTime, Transfer, TravellerDevice, TravellerIdentifier, CustomerWallet
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
Is a <a href="#">Traveling Person</a> .	
<i>Additional Notes:</i> In some cases a Traveller can be allowed to travel with a minor child (under a given age) under the same and one entitlement. Or a Traveller can be accompanying a PRM Traveller, and in such a case may benefit from specific booking and ticketing conditions.	

## 6.4 TRANSPORT SERVICE PROVIDER

<b>KEYWORD</b>	TransportServiceProvider
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	Synonym: TSP
<b>RELATED TO</b>	Organisation, TransportService, TransportNetwork, Hub, MinimumConnectionTime, Segment, TravellerPreferences, AncillaryService, Comodal, Entitlement, ThroughFare, Airline, BookingReference, TicketControllingOrganisation, TravelExpert
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
Is a specific case of TravelServiceProvider ensuring transport service operations and running the vehicles used by the passenger (TOC).	
Is an <a href="#">Organisation offering TransportService(s)</a> .	

## 6.5 RETAILER

<b>KEYWORD</b>	Retailer
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	ProductRetailer, AirTransport, Booking, BookingTimeLimit, Reservation, BookingProviderReference
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	
<p>Is an Organization selling the Products of Transport Service Provider(s) using the services of Distributors. A Retailer may have a direct commercial relationship with a TSP whereby it acts as an appointed agent and/or it may have an indirect relationship with a TSPs whereby it uses the services of a Commercial Distributor.</p> <p><i>Additional Notes:</i></p> <p>They can be Travel Agents (offline or online) including Travel Management Companies, or the direct distribution channels of Carriers (stations ticket offices, call centres, ticket vending machines, hand-held on-board devices, websites). In the Legal context, the Retailer concludes the Contract of Carriage between the Passenger and the Contractual Carrier(s) (TOC) in the name of and for the account of the latter as a function of the sales agreement which the Retailer has with the Rail Service Provider, possibly using a Commercial/Technical Distributor as intermediary.</p>	

## 7. SERVICES PERSPECTIVE

### 7.1 ACCESS SYSTEM

<b>KEYWORD</b>	AccessSystem
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Facility, Validation, Embodiment, TravelCompanionApplication, TravellerWallet, Tapping
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<u>Is a</u> <a href="#">Facility used for Validation</a> .	
<i>Additional Notes:</i> Examples are <a href="#">bus validators</a> , <a href="#">metro gates</a> among others.	

### 7.2 INSPECTION DEVICE

<b>KEYWORD</b>	InspectionDevice
<b>DOMAIN</b>	
<b>SIMILAR TO</b>	
<b>RELATED TO</b>	Equipment, Inspection, Embodiment, TravelCompanionApplication, TravellerWallet, Tapping
<b>COMMENT</b>	(draft/ <u>agreed</u> )
<b>RESPONSIBLE</b>	Functional area Booking & Ticketing (WP3)
<u>Is a</u> portable <a href="#">Equipment used for Inspection</a> .	
<i>Additional Notes:</i>	

## 8. ABBREVIATIONS

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<b>CSC</b>	Contactless Smart Card
<b>IATA</b>	International Air Transport Association
<b>ICAO</b>	International Civil Aviation Organization
<b>NFC</b>	NFC – Near Field Communication
<b>PRM</b>	Person with reduced mobility
<b>POI</b>	Point of Interest
<b>POV</b>	Point of Viewing
<b>RFID</b>	Radio Frequency Identification
<b>TOC</b>	Transport Operating Carrier
<b>TSP</b>	Transport Service Provider

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