TAP TSI

**Telematics Applications for Passenger Services
Technical Specifications for Interoperability**

Project co-funded by the
European Commission

Full Service Model
Requirements Document

Project: TAP Phase One

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1 Progress History

1.1 Document Location

This document will be uploaded to the "TAP TSI/Full Service Model / Working documents" folder of the project extranet (members' area).

1.2 Revision History

Date of delivery: 12 May 2012

Revision date	Previous revision date	Summary of Changes	Changes marked
2012-05-12		First issue	None

1.3 Approvals

This document requires the following approvals.

Name/ Entity	Title/ Remark	Approval	Date of Issue	Version
Retail Expert Groups	EG S, EG A, EG FSM			
Project Team	Project Manager, Work Stream Leaders, Project Assistant			

1.4 Distribution

This document is distributed to:

Name/ Entity	Title/ Remark	Date of Issue	Version
DG MOVE, ERA	Official recipients of the TAP Phase One deliverables	13 May 2012	Release 1.0
TAP Steering Committee	Chairs, members and alternates	13 May 2012	Release 1.0
Project Team; UIC and Ticket Vendor project coordinators	All members of the Project Team and the coordinators involved in the Grant Agreement between DG MOVE and UIC	13 May 2012	Release 1.0
Retail Expert Groups	EG S, EG A, EG FSM	14 May 2012	Release 1.0
Interested public	On http:\\tap-tsi.uic.org following TAP Steering Committee approval	tbd	tbd

1.5 Document maintenance

This document is maintained by the Full-Service Model Work Stream Leader.

Any user detecting errors or needing clarifications is invited to contact the following e-mail address: tap-tsi@uic.org.

Proposals for additions or updates can be sent to the same mail address.

2   Contents

3 Overview

The Full Service Model (FSM) is outlined within the TAP Phase One project description document issued by the Project Team on 21st June 2011and is intended to set the bench mark for rail data exchange standards covering the end-to-end traveller process for rail in Europe. It should be noted that this may help influence the global direction of such standards.

According to the Grant Agreement MOVE/B2/SUBV/2011-446/SI2.610758 between DG MOVE and the UIC, the FSM Work Stream has to deliver "The full service model and specification development plan that builds upon additional rail sector and ticket vendor requirements currently not addressed in TAP TSI, but deemed beneficial for the advancement of the rail retail market at large". This is the main contents of the document at hand.

The TAP Phase One project will, by 13 May 2012, deliver detailed IT specifications, master plan and governance for the European-wide implementation of the Telematics Applications for Passenger Services - Technical Specifications for Interoperability (Commission Regulation (EU) No 454/2011) across the EU Rail business based on existing standards.

With the exception of initial TAP TSI input FSM, has no current standards and requires the creation of a Requirements Document for discussion and agreement across the impacted parties. This document is intended to meet this need.

This document contains requirements supplied by Railway Undertakings (RUs) and Ticket Vendors (TVs). The Traveller requirements are the constructs of participating experts from RUs and TVs.

The requirements will also cover EU PRR and PRM matters to meet statutory legal requirements and provide Information to best meet both EU and global enquiries.

This document does not factor in access methods i.e. EU or global iPhone or Smartphone technology, Internet Services, B2B or B2C infrastructure and it is recommended that these should be addressed elsewhere. Standard data and messaging delivered under FSM will enable RUs to provide improved rail to rail information and TV improved multi modal services across bespoke data access/ points of sale worldwide.

3.1 State of Play

In order to address the objectives of the FSM it was necessary to assemble a group of experts that represented the broad scope of parties involved in providing the rail booking services to the traveller. This comprised of volunteers from several RUs and TVs. This being the first time ever a large group of experts from diverse backgrounds collaborated in this area, it proved time consuming to achieve cohesion of this group and to develop collaborative processes to allow productive work. In addition, in the absence of any source requirements documents being available, all the requirements had to be developed anew, and heterogeneous expectations had to be taken into account. For instance, more than 40 experts from 17 companies made contributions during and in-

between 8 monthly all-day working sessions in addition to many more man-days attending sub-group meetings. The very broad scope of the FSM has proved challenging to document in full detail and to the required standard in the timescales of the Phase One deliverables.

This document should therefore be regarded as very advanced Work in Progress and is presented as part of the Phase One deliverables to be used as a representation of what is required. It is anticipated that this document will be further developed in scope and quality as part of a follow-on programme of work that is outlined below in Section 4.

3.2 Intention

The goal of this document, when fully completed, is to provide complete and detailed requirements of the FSM and a gap analysis with the provisions of the TAP TSI. This document will be used as necessary to provide the basis of a subsequent specification and an implementation process.

The purpose of this deliverable is to establish essential prerequisites that enable realisable EU rail retailing business models and the consequent systems so as to enable new solutions to be developed on a competitive commercial basis. It will deliver a framework design and specifications for an end-to-end service model to enable the reliable, effective and economic commercial operation of European Rail distribution and end-to-end retailing systems and consider what is required to enable rail solutions that support the objectives detailed within the EU Transport White Paper.

This will build on the outputs of the other activities of the TAP Phase One project in order to extend their benefit so as to address the full scope of a traveller's needs when considering, planning and booking a rail journey, and travelling across Europe's railways. This document will contain the functional service requirements for connections between third party distribution and retailing systems and railway timetable, fares and inventory and booking systems in order to deliver a full service. This will use as input as examples the existing range of rail interconnection specifications in addition to the relevant ERA Technical Documents. The service requirements will cover: traveller information pre- during and post journey, timetable, routeing and fare enquiries, availability, reservations and bookings, fulfilment and ticketing, usage reporting, after sales processing, settlement and management information requirements. The requirements analysis will include the needs of railway undertakings as retailers and distributors in addition to those needs of third party ticket distributors and retailers, so that the resulting set of requirements can meet all interconnection requirements and conditions.

3.3 A brief summary of the process used

Due to the size and scope of the FSM it was decided to divide the entire traveller process into several Traveller Stages:

1. **Pre purchase customer information & decision support**
2. **Look – Timetables**

3. **Look – Fares and auto price**
4. **Purchase/Book**
5. **Ticket Fulfilment**
6. **Payment**
7. **Post-purchase customer support**
8. **Pre-journey information (delays, cancellations etc.)**
9. **In-journey customer information & support**
10. **Post-journey Customer support**
11. **Set-up aspects in necessary for TVs and RUs**
12. **Settlement methodology**
13. **Back office activities**
14. **Supplier sales reporting**

Four sub-groups were formed, each to take a sub set of these Traveller Stages and to work up the requirements in respect of that stage for each of the Traveller, the TV and the RU. These requirements were first captured in raw form in a Requirements Matrix document (in Excel format – see Appendix B) and then merged and ranked using the **M**o**SC**o**W** method (i.e. classified as; **M**ust have, **S**hould have, **C**ould have, **W**ould have).

A proportion of these raw requirements were selected by priority and migrated from the Matrix into this Requirements Document where they were further elaborated and refined. The balance of the raw requirements will be migrated as part of the Follow on activities outlined in Section 4 below. For reference Table 1 below outlines how the raw requirements were mapped into this document.

 At the same time a gap analysis was performed between these service requirements and the relevant specifications resulting from the recommendations of the TAP TSI Project, being the ERA Technical Documents and the larger set of UIC leaflets.

Once all the requirements of the FSM have been completed according to the above process, this document will be finalised and ready for the next stages that are outlined in the following section.

Table 1: Assignment of FSM Matrix Sheets to chapters in this document:

Subgroup	Subgroup Excel Sheets	FSM Domain	FSM Business Process
1	Pre purchase customer information & decision support	Information	Decision Support
1	Look – Timetables	Information	Itinerary
1	Look – Fares and availability	Offer	Offer
2	Purchase / Book / reservations	Booking	Booking
2	Purchase / Book / reservations	Booking	Preliminary Booking
2	Ticket Fulfilment	Fulfilment	Fulfilment
2	Payment	Payment	Payment
2	Post-purchase customer support	Post-Sales	Cancellation
2	Post-purchase customer support	Post-Sales	Refunding

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2	Post-purchase customer support	Post-Sales	Upgrade
3	Pre-journey information (delays, cancellations etc.)	Information	Transport Status
3	In-journey customer information & support	Information	Transport Status
3	Post-journey Customer support	Post-Sales	Compensation
4	Settlement methodology and reconciliation	Settlement	Settlement
4	Back office activities	Settlement	Reconciliation
4	Supplier sales reporting	Reporting	Reporting
4	Prerequisites Not involving Customer – Licensing	Commercial Agreement	

4 Follow-on Activities

This section presents an outline plan for the recommended activities that should follow on from this interim document. It is a plan to complete the functional service requirements and to create the specifications and a proposal for a target system to support a full service model, together with a process for its implementation and a preliminary business case. The proposed plan builds on the experiences and learning gained during the Phase One activities.

It is proposed that a CER/ETTSA/ECTAA "contact" group is formed as an interim practical body to manage the immediate set up and progression of these activities post Phase One until a formal body and mandate is established.

Timing estimates are dependent on how the activities will be resourced and, potentially, this will depend on how it will be funded. For illustration broad estimates for timings are given for full time resources and for comparison an indication of the time needed if part time "volunteer" resources were employed.

1. Requirements Document Completion

Actions
1. Transfer and process all remaining FSM Matrix contents into this Requirements Document
2. Refine the requirements according to consistent format and granularity whilst identifying outstanding cross linkages between the Traveller stages in order to achieve the level of detail necessary for implementable business requirements.

Resourcing
1. Requires a small Writing Team (2 or 3) who are skilled in requirements management and who can work without bias.
2. Writing team to be supported by a larger Reviewing Team representing all stakeholder groups.
3. Review and feedback sessions between the Writing Team and the Reviewing Team should be kept short, initially 2 to 3 days extending to 2 weeks, in order to ensure the Writing Team output remains close to the required scope.

Timescales
1. For full time resources, the duration is estimated at 3 months and for part time resources, estimated duration will be 6 to 9 months.

2. Identify potential solutions to address these requirements

Actions
1. Resolve governance and mandate for TVs and RUs to work together on this
2. Confirm clear objectives of stakeholders
   e.g.:
      a. To free up and develop inter and intra European travel.
      b. To open up Eastern European travel
      c. To facilitate and develop International (European inbound) sales

d. To reduce cost of distribution

3. Undertake analysis of business requirements:
   a. Identify other parallel initiatives and opportunities for synergies
      e.g.:
      i. Synergy with EU Transport White Paper (2011)
   b. Organise collaboration with and input to the UIC Online Sales Interface project (New Price Message study) and the Settlement Group
   c. Identify what is already available, dependencies and integration opportunities
      e.g.:
      i. NeTEX Location refs,
      ii. TAP TSI,
      iii. UIC leaflets,
      iv. Timetables,
      v. Fares
      vi. UIC leaflets for settlement and accounting (301) modified to account for TV
      vii. OTA etc, etc
   d. Identify architectural considerations
4. Produce alternative potential solutions designs
5. Assessment of options and selection of proposals
6. Development of specifications for selected options

Resourcing
1. Requires resources who are skilled in systems design.
2. Reviewing Team representing all stakeholder groups.

Timescales
1. For full time resources, the duration is estimated at 6 months and for part time resources, estimated duration will be 12 to 18 months.

3. Undertake a feasibility study

Actions
1. Impact and benefits analysis
2. Economic analysis
3. Legislation or regulatory impact review

Resourcing
1. Requires Industry analysts, potentially supported by external consultants if funding is available
2. Reviewing Team representing all stakeholder groups.

Timescales
1. For full time resources, the duration is estimated at 4 months and for part time resources, estimated duration will be 8 to 10 months.

## 4. Create implementation plan and funding proposal

Elements of the plan
1. Challenges anticipated
2. Participants – formal TV involvement
3. Communication processes
4. Method of funding – implementation and ongoing
5. Governance and change control
6. Regulatory changes as required to enable proposals
7. Procurement process
8. Delivery and roll out
9. Ongoing maintenance and support provisions

5 Functional Requirements

In order to ensure full coverage and avoid duplicates the requirements are bundled according to the following workflow:
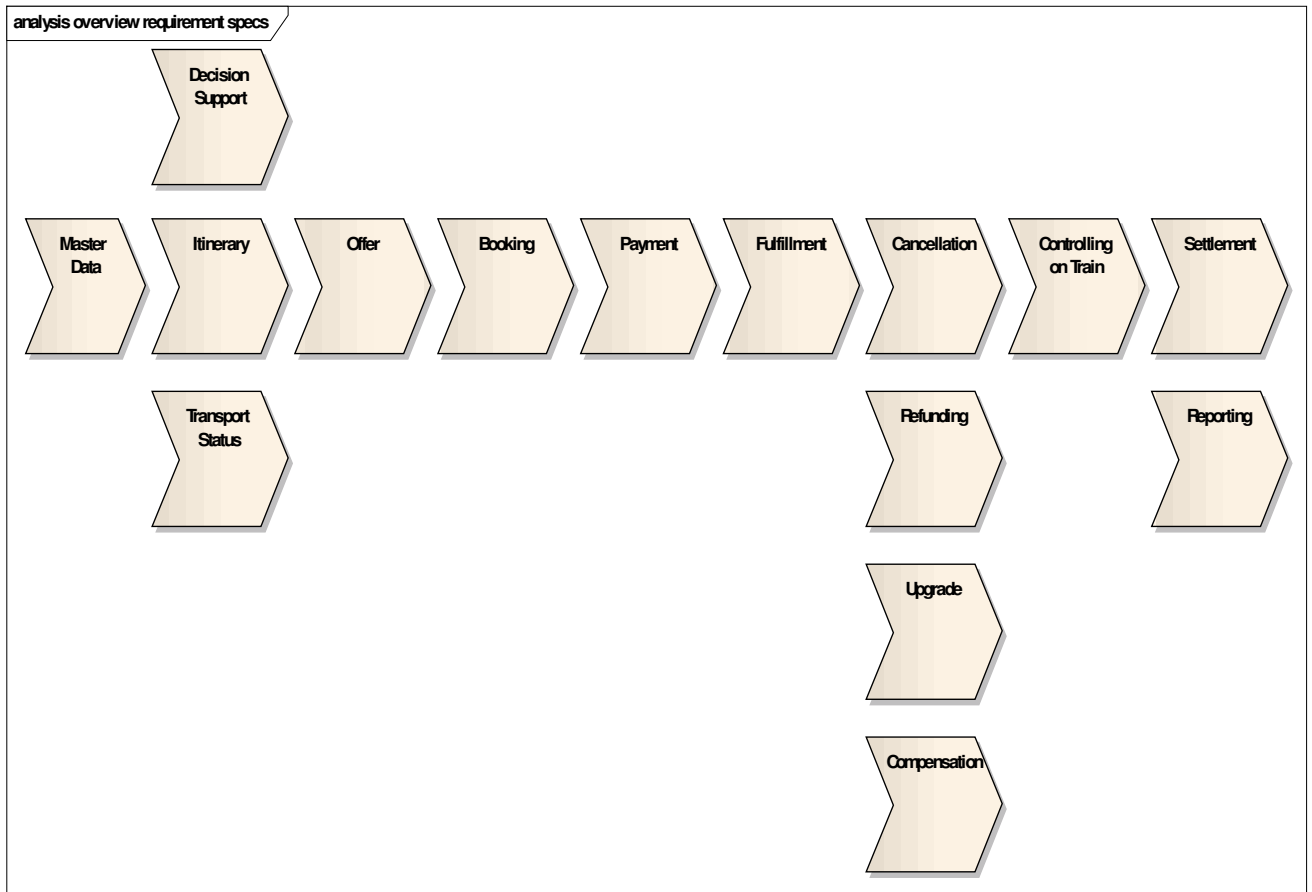
The diagram represents a simplified flow of business processes and is used to structure the analysis.

The next sub-sections of this chapter will reflect this arrangement in domains and sub-domains. Requirements are defined by an identifier, a description of the requirement, major constraints and confinements.

For example a sound functional architecture would reveal that a cancellation could start during booking as well as after payment or fulfilment. It would point out that a transport status has to be handled in-journey or pre-journey. Such allocations are functional requirements of its own and have to be mentioned in the respective chapters.

5.1 General remarks and constraints

It is a general constraint that the requirements in this document only deal with rail and are primarily targeted at those that impact the RU data standards and interfaces.

Conventions used in the following tables in this Chapter:

- Column 'Ref' points to the Id of a requirement as it has been written in the excel sheets.
- Column 'Requirer' can be Traveller, TV (Ticket Vendor) and RU (Railway Undertaking)
- Column 'TAP TSI Coverage' states N for not covered by TAP TSI, Y for covered and P for partially covered

5.2 Master Data

This section will be populated as part of the follow on activities, after completion of the remaining sections to ensure all Master Data requirements are captured.

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge

5.3 Sales

5.3.1 Information

5.3.1.1 Decision Support

Id	Ref	Req uirer	Description	Status, Constraints and Confinements	TAP TSI Covera ge
1	124	Trav eller	As a traveller I want to know if Rail is a possibility? Can I make my journey by rail? **As a traveller for an O/D request I need the information if travelling by rail is possible for the journey so that I can make a choice**	We are only dealing with rail for this requirement.	N
	124	TV	I need to respond with Rail Itinerary options to such a query for any given city-pair, both exclusively in response to a 'RAIL only' search parameter, and, comparatively together with AIR and/or other modes of transport options. **I need the common station codes and common RU codes pushed with my availability response so that I can match and make comparisons with other modes of transport**	We are only dealing with rail for this requirement. **Information requests for air and rail should be available in comparable form** [Generates a new requirement that all RUs use common station codes and common RU codes]	N
	124	RU	I need to ensure that all my distribution partners can include my schedules, availability fares within their search engines for both exclusive and mixed mode transport options/recommendations. **I need to ensure that all my schedules are published in standard format**	**[Needs another similar requirement for fares and availability – TO DO]**	P
1	124	Trav eller	At least two traveller query modes (customer self service and person being served at point of sale) must be supported:	It is not prescribed how a user interface will be designed. Just the	P

Id	Ref	Req uirer	Description	Status, Constraints and Confinements	TAP TSI Covera ge
			• Origin and destination of a journey can be of any type of location. The traveller can provide a door to door origin and destination. He can specify locations in a town or even simply a town. • In order to support a presentation on geographical maps timetable information must be linkable to a route via coordinates and it must be splittable. • All results during the query process must be linkable to each other by unique identifiers so that dedicated steps in any subsequent linked sales process can be presented in a flexible manner (e.g. in one single table instead of several pages).	requirements of using a geo-map and integrated business workflows are considered.	
2	124	TV	A ticket vendor must support one or more types of traveller query modes: • TV must be able to support any type of location it receives in a routing request. • Since a route may also be mapped onto geographical coordinates these have to be available. The coordinates have to be provided according to the coordinate systems which are used by the most established map providers in the internet so that it is possible to map each single schedule output onto a geographical map. • A specific journey must be identifiable at any subsequent linked stage of the sales process. E.g. Offers or Booking etc. • To enable a simplified purchasing process (e.g. itinerary – offer – booking) for the Traveller, offers must remain valid for a predictable time limit.	The requirements for delivery, merging and consolidation of timetables have not been specified yet. TODO	P
	124	RU	All responses to requests of a ticket vendor must be given a unique identifier. Lifetimes have to be defined which must be configurable and specific to the following stages of a sales process: • offer • booking		N

| 3 | 121, 125, 103, 215, 105, 106 | Trav eller | Journeys and in particular the routes on which a journey is built can be compiled according to some criteria. Offers for transport as part of these journeys can be requested by using criteria for the selection of tariffs and criteria which have impact on the price. Other results of a purchase (booking, refund, etc.) cannot be controlled in this way.

The criteria for the configuration of journeys and offers have to be provided in several stages:
• Most criteria can be supplied by a user in order to build some sort of a user profile. In particular self-service clients must offer a way to accept and store these preferences. These criteria are:

   o Passengers data (name, age, etc.)

   o preferred means of transport (mode)

   o excluded modes of transport

   o setting of rates terms and conditions (discount card, company card, etc.)

   o means of payment (credit card, company card, etc.)

   o loyalty card

• Travel options for the planning of an itinerary must be applicable when searching a route. These options are:

   o Fastest route

   o minimum of connections

   o preferred means of transport (mode)

   o excluded modes of transport

   o most stable journey

   o train configuration (internet on board, WIFI, etc.

   o etc. [Further TODO]

• Options that affect the conditions of an offer are: | | P |

			o Passengers age
			
			    o discount card
			
			    o best price (including promotional fares)
			
			    o class of service
			
			    o on board service (meal, type of food)
			
			    o etc. [Further TO DO]
			
			Critical issue: A Traveller may want to have a price indication or even an available fare during the planning of the journey? A router in the railway domain can only give price indications in a very restricted scope.		

	121, 125, 103, 215, 105, 106	TV	The TV must provide a service for a customer's subscription to some or all of the TV services. If a customer has subscribed to any of the services he must be offered a user profile. The user profile will contain some parameters for preferences when planning an itinerary. These parameters are:
			   • Passengers data (name, age, etc.)
			
			   • preferred means of transport (mode)
			
			   • excluded modes of transport
			
			   • setting of rates terms and conditions (discount card, company card, etc.)
			
			   • means of payment (credit card, company card, etc.)
			
			   • loyalty card
			
			   • etc. [Further TO DO]
					P

	121, 125, 103, 215, 105, 106	TV	The ticket vendor must provide a service which allows to calculate routes and build journeys according to specific criteria. These criteria will have impact on the type of route, the number of results, etc. The major criteria are:
			   • Fastest route
			
			   • minimum of connections
			
			   • preferred means of transport (mode)
			
			   • excluded modes of transport
					N

			• most stable journey • train configuration (internet on board, WIFI, etc. • etc. [Further TODO] The result must always be an end to end journey. There must not be a gap in the journey. If there is a gap which cannot be closed by footpath (or similar) it must be noted as such.		
	127-134	Trav eller	I need to know if I can preference my enquiry to include the following single or multiple search needs: • Can I take a bike • Can I reserve a bike space • By single or multiple rail suppliers • By loyalty programme • By Route • By low – high price • By day, date, time + date range • By journey time (shortest to longest) • By set price or price range (including taxes) • Reserved or Freesale (ie non-reserved service) • By passenger type (Adult, Child, UM, Student, Abonnement, PRM) • By travelling in a group • Etc. [Further TO DO] I need to know what rules apply to each response and where I can collect my travel contract / ticket.		P
	127-134	TV	I need real time access to quality timetable, availability and best fare data from RUs in order to bundle responses to fulfil Traveller request / search needs including the following as individual or multiple criteria: • Can I take a bike • Can I reserve a bike space • By single or multiple rail suppliers • By loyalty programme • By Route • By low – high price • By day, date, time + date range • By journey time (shortest to longest) • By set price or price range (including taxes) • By RU Transport Mode (Hi Speed etc) • By "via city or station" • By train type (ICE, TGV etc) • By accommodation type (sleeper cabin, couchette etc) • By gender (Sleeper cabin) • Etc. [Further TO DO] This data needs to be stored in such a way to ensure responses are both accurate and short (milli		N

			secs).		
	127 - 134	RU	I need to provide O&D data to all my distribution partners (124 applies) that I am technically able to offer to the customer myself including: • By accommodation class • By accommodation type (sleeper cabin, couchette etc) • By service type (bike, restaurant car, night train etc) • Inventory (IRT, NRT) • Booked service required (i.e. bike) • By single or multiple rail suppliers • By loyalty programme • By Route • By low – high price • By day, date, time + date range • By journey time (shortest to longest) • By set price or price range (including taxes) • By RU Transport Mode (Hi Speed etc) • By "via city or station" • Etc. [Further TO DO] I need to deliver the data in time to meet my customer, distributor expectation and internal service standards.		P
	105	Traveller	I need access to mixed modes of travel information to construct my journey.	FSM is focused primarily on rail and rail to rail information standards	N
	105	TV	I need access to standard data from RUs in order to build "joined up" mixed modes of travel responses to traveller requests processed via Retail Outlets offering rail to rail or rail to air options.	80/20 rule may apply in the 1st instance.	N
	105	RUs	I need to provide timetable, connection points and fares data (including offers) to TV and other RUs in a standard format to enable multimodal journeys to be constructed /planned and booked.	Though Journey Planner is out of scope of FSM, however FSM should deliver data in standard format that can feed Journey Planning applications.	P
	106	Traveller	I need to specify which modes of transport I want information on and what options exist to my request. I may need to mix modes to complete my intended journey.	FSM is focused primarily on rail and rail to rail information standards and cannot offer various modes or responses outside of the rail industry – other than train types (i.e High Speed v Regional).	N
	106	TV	I need to respond to Traveller preferenced requests for: • Mixed rail/air responses • Rail only responses • Air only responses I need RUs to provide standard equipment type codes to detect train types in response to train type requests.		N

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Id	Ref	Requirer	Description	Constraints and Confinements	TAP TSI Coverage
	106	RU	I need to provide comprehensive data to enable options to be provided in the event that the initial preferences cannot be satisfied so an alternative can be offered. I need these alternative options to be highlighted and returned by the TV and other RUs to the Traveller / Retail Outlet which may include hotel, other ground transportation and may or may not be part of a package.	Does this need to include quicker or cheaper, best buy options.	N
	141	Traveller	I want to be able to shop (best price and available service) by specific class / accommodation of service.	FSM does not factor Multi Modal responses so this infers aggregated rail responses.	N
	141	TV	I need to receive FSM rail data in a standard way in order to provide aggregated and matching class of service responses – i.e. economy for air and standard for rail. I need to build a table that enables class of service / accommodation to work and be matched similarly across the modes.		N
	141	TV	I need to determine how connecting airport and non- airport multi modals journey request will be displayed.		N
	141	RUs	I need to be able to activate and respond to a search request driven by a parameter and accommodation type singly or in combination.		P
	106	TV	I need to respond to Traveller preferenced requests for: • Mixed rail/air responses • Rail only responses • Air only responses I need RUs to provide standard equipment type codes to detect train types in response to train type requests.		P
	106	RU	I need to provide comprehensive data to enable options to be provided in the event that the initial preferences cannot be satisfied so an alternative can be offered. I need these alternative options to be highlighted and returned by the TV and other RUs to the Traveller / Retail Outlet which may include hotel, other ground transportation and may or may not be part of a package.	Does this need to include quicker or cheaper, best buy options.	N

5.3.1.2 Itinerary

Id	Ref	Requirer	Description	Constraints and Confinements	TAP TSI Coverage
	201	Traveller	All plan data (timetables) have to be complete and integrated. Rail specifics must be hidden in the initial presentation of a journey. The user must be		N

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			supported to get additional information if he wants to: • Carrier • Train type • Etc [Further TO DO] The initial presentation must show: • Origin and destination • Critical connections (change of transport mode, change of vehicle) • Travel modes (airplane, train, bus, subway, etc.). • Date and time • Etc [Further TODO] The presentation of journeys must start with an overview on all trips which can be easily read. Next levels of detail must be triggered by the user.		
	214, 201	TV	Timetables must cover the complete European railway network. Timetables must be accurate, complete and integrated: • In order to be complete, all timetables have to be provided by the carriers just in the time they have been made public. The connections between different carrier's timetables have to checked and adapted so that each connection is seamless (regarding the timetable source) and correct. • In order to be accurate the overall timetable date have to be consolidated when a new version of a carrier's timetable was sent. These points of time may not be synchronized. • In order to be accurate each carrier and / or infrastructure manager has to provide the status of running trains. Short-lived events like delays are not relevant. Disruptions which have impact on the routing and hence the planning of an itinerary are: o incidents	OPEN: In order to fulfil these requirements we have to specify requirements for IM as well.	N

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			○ strikes ○ works on a train line ○ etc [Further TODO] • In order to be integrated a single source of timetables and transport status has to be provided.		
	201	RU	An RU has to provide timetables and new versions of timetables in time and to a standard. The standard has to comprise MERITS and local traffic plans (e.g. SIRI). There will be amendments like the ones in HAFAS – and others. [Further TODO]		P

5.3.1.3 Transport Status Pre-Journey

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
	801	Trav eller	I want to be able to view my reservation and itinerary anytime – online, mobile etc. **SO THAT I have ready access to my journey information**	This relates to 'read-only', the requirement to do something with the information e.g. change/cancel should be captured elsewhere	N
	801	TV	I want to provide my customer with the ability to view his or her Booking details through my website, mobile app or other agency tool **SO THAT I can provide the customer with the ability to view their journey details at any time**	This relates to 'read-only', the requirement to do something with the information e.g. change/cancel should be captured elsewhere	N
	803	Trav eller	As a customer, I want to be informed in a timely manner of information relating to engineering works, strikes and other disruption that may affect my journey. I want to be made aware of the options in terms of refunds, re-booking or re-routing and who to contact to effect such refund/re-routing/re-booking. **SO THAT I can make an informed decision whether to continue on my journey or postpone to another date or choose a refund**	It is expected that there will be different options based on the severity of the disruption and the client should expect a standard set of options in terms of re-routing, partial or full refunds.	P
	803	TV	I want a system which automatically provides real-time traffic updates, and through which I can keep my customers informed. I want to be able to provide 'real-time' journey information relating to platform numbers, delays, cancellations etc to the client by any sensible means e.g. Internet, sms, mobile. Additionally, I want to be pushed specific information about major	The information needs to be accurate and impartial	P

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			issues. **SO THAT I can keep my customers updated with relevant service information and to provide a professional service to my customer**		
	803	RU	I need to inform my customers when departure time is approaching and during the journey **SO THAT I can provide customers with relevant service information**		P
	808	Trav eller	I want to be informed if there is a change to the time of arrival or departure of my train. If I have been advised of a platform number in advance, I would like to be advised if the schedule change also changes the platform number **SO THAT I can make the appropriate changes to my onward plans if needed and/or advise people I'm meeting of the new time. I want to know the new platform number so that I do not go to the wrong one and possibly miss my train.**	The information should be sent from the customers point or channel of purchase.	P
	808	TV	I require real-time information on operators' schedule changes **SO THAT I can advise my customer of the appropriate impact**	Any re-booking due to the schedule change should be captured in an alternative requirement [Further TODO]	P
	808	RU	I need to give travellers the possibility to check their journey has not changed. For frequent travellers who I have contact details I need to contact them directly to inform them on the changes. For 3rd party distributors clients, I need to provide information to the TV. Carrier's schedule changes can be published and subscribed by TVs and/or Customers (e.g. via feeds). For booked travel changes can be published to Entitlements and/or Customers when known. **SO THAT I can advise customers of the appropriate impact**		P
	809	Trav eller	I want to check-in before my travel If there is a requirement for a pre-boarding process for a particular train, I want to be informed what this is when I book my ticket and how long in advance I need to arrive at the station **SO THAT I arrive in good time for my train and do not miss the service due to procedures that I am not aware of**	This only currently applies to Eurostar services	N
	809	TV	I need to be advised by the carrier if there are any special procedures for check-in or security before the customer boards the train. I need to be able to provide this information to my customer as part of the booking process **SO THAT I can make my customer aware of them so that they arrive in good time for my**		N

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			train and do not miss the service due to procedures that they are not aware of		
	810	RU	I need timely info on possible disruptions from IMs and SMs **SO THAT I can evaluate this and cascade to customers and TVs**		Y
	811	Trav eller	I want to be informed by appropriate means – e.g. SMS, email if my train service is delayed or going to be delayed for whatever reason and I want to know what the impact of this will be on any connecting trains. I want to be offered viable alternatives **SO THAT I can choose whatever option suits me according to my plans.**		P
	811	TV	I want to have access to live and accurate train running information **SO THAT I can inform my customers of any delays and inform them of the impact plus offer alternatives which may include re-booking or refunding. I want to be able to advise of alternative rail connections**		P
	811	RU	I want to be able to provide the customer with up to date information on their rail journey **SO THAT I can ensure they are re-booked if appropriate on another service**		P

5.3.1.4 Transport Status In-Journey

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
	901	Trav eller	**Delays & impact** – As a customer, I want to be informed of any delays to my train before I board and during the journey and any impacts that it will have on my connections including being offered alternatives and I want to know who to contact to help with my onward plans/re-booking etc, **SO THAT I can make an informed choice about alternative travel plans**		P (N)
	901	TV	If there is a delay to my passenger's journey which may affect their arrival time or connection, I need the ability to re-book/re-route based on any delay information in which case I need to be informed about any major or critical delays **SO THAT I can service my customer appropriately.**	This requires the retailing system to have live information on how the service is running – there is little point rebooking on a service that is also running with a delay	N
	902	Trav eller	I want to access information about the route (stops, connections, platforms etc) plus destination information via on board leaflets, an electronic info point on the train (if available), via announcements and I would like to be able to access information	This could be made available via RU's own equipment and/or providing a way for the customer to obtain their	N

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			using my own mobile, tablet or laptop device using on-board WiFi **SO THAT I know what progress I am making with my journey and so that I can plan connections**	own information via their own channel of choice	
	903	Trav eller	**PRM assistance** – as a customer, I want to ensure that the onboard team is aware of my PRM needs and that my connecting train services are also informed. I want to be reassured at all times that my assistance request is known about and can be handled. If there is a schedule change or a delay, I'd like to have confirmation that my assistance request is maintained **SO THAT I am reassured that the service request will be fulfilled**	This relates to in-journey information only and is intended to provide reassurance to the traveller	N
	906	Trav eller	I want to ensure that all information relating to departure, arrival and connection times are in local time. Where there is a change of time-zone e.g. Eurostar, I want to be reminded of this en route. **SO THAT there is no confusion over arrival/departure or connection timings**		N

5.3.2 Offer

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
	301, 302 and 303	Trav eller	An offer will always be a full offer. If parts of a journey cannot be served by one of the contracted carriers this has to be indicated as such. The type and the range of offers must be modifiable during the planning of the itinerary. The criteria are: • best prices • flexibility • seat reservation requested • etc [Further TODO] The result will show details in two stages. An overall initial view must only show fares and resources like seat. A second level of details will be more comprehensive and show details of a tariff (terms and conditions of booking, transport and post-sales). These details are: • Flexibility • Served segment (for post sales operations during the journey)		N

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			• Etc [Further TODO]		
	301, 302 and 303	TV	The ticket vendor must be able to compile requests to carriers which contain a customer's preferences and benefits: • discount card • best price (including promotional fares) • etc. Etc [Further TODO]		N

5.3.3 Booking

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	416	TV	The requirement is to be able to 'undo' or 'modify' a booking shortly after it has been made: • without incurring any normally applicable penalties • without hitting a normally flat refusal due to Fare Rule restrictions. **SO THAT : the traveller is not penalised by any error in the specification of the booking details, made by the traveller (him or herself) or by the retailer performing the Booking transaction.**	Should apply to both Self-service and Retail Booking modes. What would be an acceptable period of 'grace'? *Check any locally applicable consumer legislation especially with regards to credit card payments and options/rights to 'pull out' of a sale.* *See also 713 (cancel ticket due to error)*	N
2	418	Trav eller	The requirement is to be able to specify seating preferences by reference to 'other' travellers. Examples of this are: • by traveller name (I want to sit next to Mr. X) • by reference to multiple, or a group of, travellers (I want to sit with the other members of my family, group, etc.) • I want to sit alone if possible. **SO THAT : the traveller can express their preferences without requiring specific knowledge of the seating arrangements of other passengers and without requiring any specific knowledge of the physical layout of seating**	A comprehensive but efficient system / logic for covering all types of Traveller reference to other travellers. This is NOT a requirement which can be solved with Seat Map or Carriage Layout graphics. *Check any legal constraints with regards to 'privacy'.*	P

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			arrangements in the train carriages.		
3	425	Trav eller	The requirement is to be able to book services which can assist a Traveller with reduced mobility: • On the train • At stations (arriving, boarding, descending, leaving) **SO THAT as a traveller with reduced mobility, I can complete the entire journey without difficulty from arriving at the origin station to leaving the destination station.**	The solution needs to cover single and multiple journey legs.	N
4	425	Trav eller	The requirement is to be able to book tickets and/or seats which are priced and/or available specifically for travellers with reduced mobility. **SO THAT the traveller with reduced mobility can take advantage of any commercial/product propositions for which their reduced mobility entitles them.**	The solution takes account of any information that should be passed at booking time in order to qualify for the 'reduced mobility' product.	N
5	425	TV	The requirement is for the interface between the Ticket Vendor (or RU retailer) and the RU travel provider(s) to support, functionally, the booking of supplementary but dedicated PRM services (on board or at origin/destination stations) and to support the passing of relevant 'information' in the booking of a product specifically targeting travellers with reduced mobility. **SO THAT travellers with reduced mobility may book travel products and services appropriate to their needs, with the same facility and efficiency as other travellers.**	This requirement suggests at least a complementary requirement for the interface between the RU travel provider(s) and 'stations' and/or for an interface between the retailer and 'stations'. The solution must take multi-leg journeys into account.	P
6	428	RU	The requirement is for all sales of RU products (specifically of NRT products) to be concluded via an interactive exchange with the product owner RU system requesting/notifying the sale. **SO THAT RUs can be aware of all NRT product on their trains and not have to rely on independent declarations of sales volumes from non-interacting retail systems (TV or RU). This provides a level of financial control for NRT product owning RUs, which is missing today**	This requirement impacts the architecture underpinning the sale of NRT products by authorised sellers (RU or TV).	N
7	428	TV	The requirement is for TVs as retailers (whether TV or RU) who manage the sale (payment and ticketing processes) for NRT products, to: • Send a notification/request message to the product owner RU • To conclude an NRT sale only upon receipt of the RU acknowledgement of this notification/request message	This requirement impacts the architecture underpinning the sale of NRT products by authorised sellers (RU or TV).	N

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Cover age
			SO THAT the RUs can be aware of ALL sales on their trains.		
8	429	Trav eller	The requirement is for the Traveller to be able to book multiple legs of a journey on multiple providers in one shot. **SO THAT the Traveller can save time and avoid the risk of successfully booking only part of the intended itinerary, which would consequently need cancelling, thereby potentially incurring financial penalties.**	The solution must cover each of the product types (IRT; NRT alone, with seat, with seat separate, TLT etc.)	N
9	429	TV	The requirement is for the interface between the Ticket Vendor and the product owning RUs to support a 'preliminary booking' process which is concluded either by a confirmation or the 'absence' of a confirmation of the 'booking': with the Ticket Vendor determining the conclusion as a function of securing preliminary bookings on all Traveller requested journey legs (or not). **SO THAT the Ticket Vendor can return to the Traveller either;** • **A completely booked journey, or** • **A non-successfully booked journey notification, but with no 'tidying up' to perform and no financial penalties.** And **SO THAT a clear outcome of the process is known to each implicated RU.**	The solution must cover each of the product types (IRT; NRT alone, with seat, with seat separate, TLT etc.)	N
10	429	RU	The requirement is for the product owning RU to manage the 'preliminary booking' process on their side, ensuring that inventory may be 'held' for a reasonable time but not blocked for resale in the event of non-confirmation. **SO THAT RUs may enable the retailing of multiple legs on multiple carriers and still optimise their sales**	The solution must cover each of the product types (IRT; NRT alone, with seat, with seat separate, TLT etc.)	N
11	435	TV	The requirement is to be able to make a preliminary booking based upon the Ticket Vendor's own context of offers, supplying all data necessary in the booking request message for the product owning RU to register the booking in its own system. **SO THAT Ticket Vendor's can more easily respond to Travellers' shopping habits and preferences.**		N
12	435	RU	The requirement is for the RU to make a booking in its own system without reference to its own context of offers, which means receiving, validating and successfully processing all booking details as provided by the Ticket Vendor. **SO THAT the sale of RU products and services may be optimised during a shopping process managed by the retailing system.**		N

Id	Ref	Requirer	Description	Constraints and Confinements	TAP TSI Coverage
13	436	RU	The requirement is for the RU to receive the appropriate references (contract, agreement, discount code etc) in the booking message from the retailer (TV or RU), **SO THAT the appropriate negotiated corporate fares may be successfully obtained by the corresponding corporate traveller or corporate travel manager.**	Partially covered by TAP TSI	P
14	438	RU	The requirement is for all information pertaining to specific fulfilment messages to be received in the booking message from the retailer e.g. • Passenger names for Print@home • 'Ticketless card' info for Thalys Ticketless • Etc [Further TODO] **SO THAT the use of certain fulfilment methods (and their benefits) may be optimised.**	Partially covered by TAP TSI	P
15	439	Traveller	The requirement is for all types of supplementary (ancillary) products and services to be bookable by Travellers, using the same type of booking process as in the principal travel purchase e.g. additional luggage. **SO THAT the traveller may conclude their travel booking arrangements easily and at the same time as their principal Travel booking, without resort to special or atypical procedures.**	Partially covered by TAP TSI	P
16	441	TV	The requirement is to be able to pass all passenger related information (name, DOB or age, Address, FQTV, Discount Cards Etc [Further TODO]) in a Booking Transaction **SO THAT all products and/or processes requiring this data may be accessed.**	Partially covered by TAP TSI	P
17	444	Traveller	The requirement is for the booking process to reflect my home currency **SO THAT the Traveller may more easily evaluate and purchase the product(s) s/he is interested in.**		N

5.4 Enabling

5.4.1 Payment

Id	Ref	Requirer	Description	Constraints and Confinements	TAP TSI Coverage
1	602	Traveller	The requirement is for the Traveller to be ensured that PCI standards are applied which protect their	PCI standards are defined by the credit	N

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			credit card data details by inhibiting their display, print or transmission, except to authorised persons and or systems in the value chain. **SO THAT the Traveller does not lose confidence in using their credit card as a form of payment (regardless of channel).**	card industry and apply to merchants of all descriptions.	
2	602	TV	The requirement is that the Ticket Vendor (whether TV or RU or Distributor) systems are compliant with PCI standards **SO THAT no traveller credit card details can be read and/or accessed by unauthorised personnel.**	PCI standards are defined by the credit card industry and apply to merchants of all descriptions.	N
3	605	Trav eller	The requirement is for the Traveller to be able to pay for a multi-leg ticket on multi-RU services in a single shot – in particular by credit card leaving just one line on the Traveller's credit card statement. **SO THAT the Traveller is easily able to account for their travel spend.**		N
4	605	TV	The requirement is for the retailer (whether TV or RU) to be able to invoke a credit card authorisation request against a single Merchant ID (their own or that of the marketing RU in the case of jointly marketed services priced under a 'through fare'), **SO THAT the payment process is simplified for the Traveller, whilst onward redistribution of the Traveller's spend can be handled by agency-provider or interline settlement processes.**	If the Ticket Vendor has no merchant ID and the products being paid for are not joint products marketed by one or another single entity, then it is probably impossible to meet this requirement, since each travel providing RU would need to be a merchant in their own right, and will require a separate payment transaction. [Further TODO]	N
5	610	Trav eller	The requirement is for the Traveller to be offered whatever payment options they find most convenient, **SO THAT payment is easy and not an obstacle to the sale.**		P
6	610	TV	The requirement is for the retailer (TV or RU) system to be able to manage a variety of payment options either 'in-house' or across the interface with the RU where such interface is configured for the RU system to handle the payment process **SO THAT sales may be optimised and not constrained by limited payment options.**		P
7	610	RU	The requirement is for those cases where the RU interface with the Retailer (RU or TV) needs to support passage of payment information to the product owning RU (e.g. in the case of Discount or Gift Vouchers, but also in the case of Ticket Vendor	Thorough analysis of the different 'payment configurations' (including interface impacts), and forms of	P

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Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			configurations where the TV does not necessarily handle all non-Cash type payments) **SO THAT RU sales shall not be adversely affected in markets, for example, where non-standard but popular forms of payment exist but which are not catered for.**	payment needs to be undertaken. [Further TODO]	
8	611	Trav eller	The requirement is for the Traveller to be able to pay in their home currency **SO THAT the Traveller understands the price of the ticket and is not exposed to currency exchange risk.**		N
9	611	TV	The requirement is for the Ticket Vendor to keep track of the currency quoted at time of offer and subsequent booking, especially if a conversion had been necessary from the currency of the RU's own pricing process to the currency of the point of sale and (therefore) home currency of the Traveller. **SO THAT the payment can be made in the home currency of the Traveller.**	Need to check but currency must probably comply with the currency of the point of sale (unless the point of sale itself is capable of handling different currencies).	N

5.4.2 Fulfilment

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	506	Trav eller	The requirement is for a fulfilment method(s) that does not depend upon the Traveller presenting a physical ticket **SO THAT the Traveller does not need to print anything and cannot 'lose' their entitlement to travel.**	This requirement suggests new architecture for the fulfilment process and subsequent Ticket Control and Post-Sales processes.	N
2	506	TV	The requirement is for the TV to be able to electronically transmit the ticket to a repository which can be accessed by any authorised party on behalf of the Traveller. If not actually responsible for the issuance of the ticket, the TV still needs to receive the Ticket repository reference, **SO THAT such tickets or 'copies' do not have to be synchronised between parties entitled to access it; and,** And **SO THAT follow-up transactions may be performed by any authorised party knowing that the transaction will target a completely up-to-date ticket.**	This requirement suggests new architecture for the fulfilment process and subsequent Ticket Control and Post-Sales processes.	N
3	506	RU	The requirement is for the Ticket Control process on the train to result in the correct tagging of the usage of any of the journey legs, in the appropriate Ticket record in the Ticket repository	This requirement suggests new architecture for the fulfilment process and subsequent Ticket	N

			SO THAT the RU is protected from fraud (e.g. use of an electronic ticket, and then presenting it for refund); and **SO THAT the process controlling post-sales transaction requests can know, with regards to each leg in a journey which has been electronically ticketed, whether it is:** • **Open; or already:** • **Travelled** • **Cancelled** • **Refunded** • **'boarded/being travelled'** • **etc.** **in order to validate (or not) any such request.**	Control and Post-Sales processes. Analysis of the whole process is required in order to determine which 'status' can be accurately and meaningfully attached to any leg of an electronic Ticket and at what point in the process it can be attached.	
4	518	Traveller	The requirement is for the Traveller to be satisfied that someone has responsibility for ensuring their transport over a multi-leg journey: and who that party is with respect to each leg of their journey. **SO THAT the Traveller knows who to turn to in case of a difficulty or in case of non-provision of travel services.**	PRR (passenger rights and regulations) covers this. Notifications should be correctly synchronised with PRR as well as with the 'product': any multi-leg product marketed and sold by a single RU may imply financial responsibilities over and above the operational responsibilities attaching to the provider of the transport for each leg of the journey.	N
5	518	TV	The requirement is for the Ticket Vendor to inform all relevant and 'responsible' RUs of all pertinent details of a multi-leg journey, **SO THAT pre- and in-journey information may be exchanged between RUs in the case that any kind of disruption to the normal completion of one leg of the journey may impact the operation of another with respect to ensuring the Traveller's continuation and completion of their journey.**	PRR (passenger rights and regulations) covers this. Notifications should be correctly synchronised with PRR as well as with the 'product' : any multi-leg product marketed and sold by a single RU may imply financial responsibilities over and above the operational responsibilities attaching to the provider of the transport for each leg of the journey.	N
6	518	RU	The requirement is for each RU in a multi-leg journey to be aware of the other legs of their Traveller's journey **SO THAT one RU may inform an RU responsible for the subsequent part of the Travellers journey in case of operational difficulties such as cancellation or delay, which may put at risk the Traveller being able to make the necessary connection.**	PRR (passenger rights and regulations) covers this. Notifications should be correctly synchronised with PRR as well as with the 'product': any multi-leg product marketed and sold by a single RU may imply financial responsibilities over and above the operational	P

				responsibilities attaching to the provider of the transport for each leg of the journey.	
7	519, 526	Traveller	The requirement is for the Traveller to be able to choose the desired fulfilment method, regardless of product purchased. **SO THAT Travellers may select the method which is most convenient for them without limitation on the choice of product.**	The solution suggests some modification to the architectural structure of current ticketing, ticket delivery and ticket control processes.	P
8	519, 526	TV	The requirement is to separate the Ticket Delivery mechanism from the Ticketing process and product being ticketed, **SO THAT the retailer (TV or RU) may satisfy the Traveller's fulfilment preference, whether individual or corporate Traveller, and still be able to issue a ticket for the purchased product.**	The solution suggests some modification to the architectural structure of current ticketing, ticket delivery and ticket control processes. The solution must still cater for the needs of corporate customers who wish to fulfil their travel requests within the corporate premises.	P
9	519, 526	RU	The requirement is for a Ticket Control process and interface which protects the RU product owner from fraud, **SO THAT the RU has no need to limit the sale of certain flexible (refundable, exchangeable) products to ATB-only fulfilment methods.**	The solution suggests some modification to the architectural structure of current ticketing, ticket delivery and ticket control processes.	P
10	525	RU	The requirement is for the RU to make the fulfilment method known to the retailer, in cases where such methods need to be restricted **SO THAT RUs are not exposed to a fraud risk when selling their products.**	Note: the solution may be seen as a preliminary solution until such time as the solution for requirements 6,7 and 8 may be implemented in the industry.	N
11	527	Traveller	The requirement is for a single Ticket to cover the Traveller's journey when it consists of multiple legs on multiple carriers. **SO THAT the Traveller does not get confused with different tickets, and has a unique Ticket reference for their entitlement to travel with multiple providers.**		N
12	527	TV	One requirement is for the Ticket Vendor to package a series of discretely marketed, priced, and booked, products under the umbrella of a single Ticket, whilst ensuring that each RU receives details of the electronic entitlement pertinent to their leg of the journey tagged with the umbrella Ticket reference. **SO THAT even though the Traveller's journey may comprise travel providers with separate responsibilities, the whole journey is grouped under a single reference for the Traveller's convenience.**	Underlying architecture probably does not need modification.	N

13	527	TV	A second requirement is for the Ticket Vendor to be able to issue a single ticket for a jointly marketed, jointly priced, 'through fare', product ensuring that where there is single financial responsibility for the entire journey, the relevant RU will receive details of all the electronic entitlements grouped under the single ticket, **SO THAT the financially responsible RU is able to control, respond to, and process any post-sale request, by reference to the status of the remaining electronic entitlements within the single ticket.**	Solution for this requirement is likely to suggest a change in structural architecture underlying today's ticketing and fulfilment processes.	N
14	527	RU	The requirement of the RU is to be able to access any of the electronic entitlements, grouped under the single ticket, for which the RU has operating and/or financial responsibility; and to be able to access them based upon the single ticket reference, **SO THAT the RU may cover their financial responsibilities with regards to post-sale requests, invoking pro-rate evaluation of individual electronic entitlements according to commercial and fare-rule terms agreed with the other operating and/or marketing RUs.**	From an operational perspective, the use of pre- and in-journey realtime information (delays, cancellations etc.) exchanges, may vary according to the type, or lack of, commercial agreement between RUs cooperating in the journey	N
15	531	Traveller	The requirement is for the Traveller to be able to use their smart travel card as both personal ID (as requested by the Ticket Control procedures) as well as the actual travel entitlement, or access to the entitlement via a smart card reader **SO THAT I don't have too many items to carry when making regular trips.**		N
16	531	RU	The requirement is to be able to identify the person – so if the smart card is sufficient to do so, the RU must make that information known to the passenger at the time of sale of the smart card. **SO THAT the Traveller does not carry unnecessary personal identification documents in order to support consumption of their entitlement to travel.**		N
17	536	Traveller	The requirement is for the price of the Ticket to be expressed in my home currency. **SO THAT the display of the ticket, or the paper ticket audit coupon, or my printed copy of the ticket, or my receipt of the ticket, serves as an easy reminder to what I have spent and can be easily accounted for.**		N
18	536	TV	The requirement is that the retailer (TV or RU) must be able to ticket in the home currency of the Traveller where that currency may not be used in the Product Owner pricing process. It means that a conversion process must have been undertaken in order to make the initial offer and subsequent booking in the home currency: the retailer must have access to that information from the preceding		N

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
			offer and booking processes. **SO THAT the Traveller's requirement for home-currency on the Ticket can be respected.**		
19	536	RU	The requirement is for the RU to determine which source of currency exchange rate should be used by the retailer in circumstances where the RU product is retailed in a different currency (corresponding to the home currency of the Traveller). **SO THAT RU products and services are not under- /over-charged due to dependence on unreliable exchange rate sources.**		N

5.5 Post-Sales

5.5.1 General

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	705	Trav eller	The requirement is for the traveller to be able to consider what the conditions and cost of a post-sale request they are contemplating would be before committing themselves. **SO THAT the traveller may be sure of the consequences of their action before requesting the change/modification.**		N
2	705	TV	The requirement is for the retailer (TV or RU) to be capable of simulating any post-sale transaction without actually performing it **SO THAT the traveller can be informed of the conditions and cost of the transaction before deciding to request it.**		N
3	705	RU	The requirement is for the RU to provide the fee conditions/penalties attached to a post-sale change on request of the retailer (TV or RU) in addition to having provided these during the pre-sale shopping phase. **SO THAT the retailer (TV or RU), or the financially responsible RU, is able to simulate the transaction for the traveller in the case they do not have the relevant restrictions/rules data available.**		N
4	710	Trav eller	The requirement is for the traveller to be able to consult, at any subsequent time, via display or print, all details of the journey they have purchased. **SO THAT the traveller can be reminded as to how their journey will unfold and/or see what details of their trip may need to be changed to accommodate changing circumstances.**		N
5	710	TV	The requirement is for the retailer (TV or RU) to		N

			reveal, on request of the traveller, all details of the traveller's trip via : • An online display • The transmission of a full travel document for printing or storing **SO THAT the traveller can be supported in recalling both the details of their journey as well as the applicable financial conditions in case of a need to make changes.**		
6	723	Trav eller	The requirement is for the traveller to be able to perform certain post-sale transactions themselves on the internet **SO THAT post-sale modifications can be performed for internet sales, and/or sales performed by a retailer (TV or RU), without the need for the traveller to contact an intermediary in order to perform the required transaction.**		N
7	723	RU	The requirement is for the RU to have access to real-time Ticket Control data/operations **SO THAT post-sale internet transactions can be evaluated and fraudulent practices inhibited.**		N

5.5.2 Cancellation

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	713	Trav eller and TV	The requirement is to be able to cancel a ticket shortly after it has been issued: • without incurring any normally applicable penalties • without hitting a normally flat refusal due to Fare Rule restrictions. **SO THAT the traveller is not penalised by any error in the specification of the booking details, made by the traveller or by the retailer performing the Booking transaction.**	Should apply to both Self-service and Retail Ticketing modes. What would be an acceptable period of 'grace'? *Check any locally applicable consumer legislation especially with regards to credit card payments and options/rights to 'pull out' of a sale.* *See also 416 (undo booking due to error)*	N
2	713	RU	The requirement is for the RU to provide a possibility to cancel at ticket without fees, within a reasonable time after purchase **SO THAT the traveller is protected from normal financial consequences in the case of an error in booking/ticketing details made themselves or by the retailer (TV or RU) on their behalf.**	What would be an acceptable period of 'grace'? *Check any locally applicable consumer legislation especially with regards to credit card payments and*	N

				options/rights to 'pull out' of a sale. *See also 416 (undo booking due to error)*	
3	713	Traveller	The requirement is for the traveller to be able to cancel a ticket (and pay any cancellation penalties incurred if necessary). **SO THAT the traveller may cancel their travel plans as a result of a change in circumstances which obviate the need to travel.**		N
4	713	TV	The requirement is for the Ticket Vendor to be able to process a Traveller's desire to cancel their journey and decide, based upon reporting/settlement configuration/timelines whether this needs to be treated as a Refund (in which case see appropriate section below) or whether the transaction can be treated simply as a cancellation notification. **SO THAT in case the Settlement is not handled by the RU and a cancellation notification (for stock control purposes only) is a legitimate transaction to report against a Ticket Number (with no sale previously reported) no financial consequences are processed.**	Current settlement configurations are normally RU based, meaning that once a confirmed booking is received, the liability for the TV to pay is invoked, and this would normally mean that the traveller's action must be treated as a Refund case…..however, in the case where 'Independent Settlement Processor' requirements (see below) may have been catered for, this may create a natural window in which cancellations could be permitted, since the liability for the Travel Agency to pay might shift from the 'confirmed booking' event to the 'sale reported' event (see this also in conjunction with 416).	N

5.5.3 Refunding

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Coverage
1	716	Traveller	The requirement is for the traveller to be able to get a refund for an unused ticket (fare rules permitting) **SO THAT the traveller is legitimately reimbursed.**		P
2	716	TV	The requirement is for the retailer (TV or RU) which has performed the original sale, to be able to process a traveller's refund request, and capture any key financial data (cancellation penalty, travel agency commission etc.) which may be required for transaction reporting to the appropriate Settlement processor.		P

Id	Ref	Requirer	Description	Constraints and Confinements	TAP TSI Coverage
			SO THAT the traveller can be correctly reimbursed and accurate settlement can be performed between RU product owner and retailer (TV or RU).		
3	716	Traveller	The requirement is for the traveller to be able to be refunded for any unused portion of their ticket (fare rules permitting) **SO THAT if the traveller needs to cancel any subsequent journey leg, having already 'consumed' one or more legs of the journey, they can be reimbursed appropriately.**		N
4	716	TV	The requirement is for the retailer (TV or RU) which has performed the original sale, to be able to access the value of the untravelled journey legs of a multi-leg ticket. **SO THAT they can accurately reimburse a traveller who wishes to cancel a later portion of a multi-leg ticket.**		N
5	716	RU	The requirement is for the RU product owner, who is financially responsible for a multi-leg ticket, and whose tariff rules permit it, to be able to calculate the value of the portion of that ticket which the traveller wishes to be refunded for and make this data available, **SO THAT the orginal retailer (TV or RU) performing the refund transaction for the traveller may have access to the correct amount to be reimbursed.**		P

5.5.4 Upgrade

Id	Ref	Requirer	Description	Constraints and Confinements	TAP TSI Coverage
1	718	Traveller	The requirement is for the traveller to be able to upgrade/modify their ticket in order to: - upgrade from 2nd to 1st class (also on parts of the ticket) - make a detour on the journey - be able to take a higher train type on the journey **SO THAT a traveller is able to take advantage of RU upsell opportunities it wishes to create.**		P

2	718	RU	The requirement is to be able to handle the 'upsell' to the traveller in the most suitable way
			   • As an exchange case for IRT
			   • As a supplementary 'Ancillary Service' sale transaction for NRT (class upgrade or higher train type)
			   • Etc [Further TODO]
			
			SO THAT simplicity is optimised both for the traveller and for the settlement processes which may attached to different product types.
					P

5.5.5 Compensation

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	1001	Trav eller	**Delay compensation** – I want an easy way to find out if I am entitled to monetary compensation and/or exchange my ticket for a delayed trip or receive travel vouchers and an easy way to claim that compensation. Ideally, there should be a standard policy for all train companies and it should be obvious who I claim this from **SO THAT I do not have to make lots of separate enquiries to find out the right process and to find out if I am entitled to any compensation**		N
2	1001	TV	**Delay compensation/validation** – I want to be able to provide my customer with the correct information relating to appropriate compensation for delays. I want to be empowered by the carrier to provide this compensation or to facilitate the ticket exchange without the need for the customer to contact the carrier directly. **SO THAT neither my customer nor I have to make lots of separate enquiries to find out the right process and to find out if they are entitled to any compensation**		N
3	1001	RU	I need information on the reasons for delays, including those outside my control, to establish if the customer has a right to compensation and I need to retain the information for 1 year after travel. **SO THAT I can determine whether or not I am liable for the compensation claim**		P
4	1005	Trav eller	I want to choose whether to claim my delay compensation at arrival station or later using electronic as well as traditional means. I want my claim to be trackable and I don't want to have to go through a long administrative process to achieve the refund **SO THAT I receive any compensation due to me without having to go through a lengthy written process**		N
5	1005	TV	I want to be able to process a compensation claim on behalf of one of my clients. I want to be able to initiate and track a claim and be able to report progress to my client. **SO THAT I can provide a full compensation service to my client**		N
6	1005	RU	I want to establish a process that ensures that only genuine customers can claim compensation for delayed services. I want to be able to ensure that their claim is not repeated for the same trip by having a unique tracking solution for each claim.		N

			SO THAT I only make genuine compensation payments		

5.5.6 Exchange

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	714	Trav eller	The requirement is for the traveller to be able to exchange their unused ticket for a new ticket using the old ticket as partial payment. **SO THAT previously reported or settled sales transactions do NOT have to be 'undone' (refunded) and only a new ADD Collect amount needs to be paid for by the traveller.**	This requirement needs to be considered against current and potentially future Settlement processes: simplicity for the traveller needs to be matched by simplicity (keeping costs down) on the RU Settlement and accounting side. If not, the industry could decide that the requirement is too costly.	N
2	714	Trav eller	The requirement is for the traveller to be able to exchange the unused part of their ticket for a new ticket, using it as partial payment. **SO THAT previously reported or settled sales transactions do NOT have to be 'undone' (refunded) and only a new ADD Collect amount needs to be paid for by the traveller.**	This requirement needs to be considered against current and potentially future Settlement processes: simplicity for the traveller needs to be matched by simplicity (keeping costs down) on the RU Settlement and accounting side. If not, the industry could decide that the requirement is too costly.	N
3	714	Trav eller	The requirement is for the traveller to be able to exchange their unused ticket for a new ticket which costs less and collect a refund of the difference (fare rules permitting) **SO THAT the traveller does not need to make a new payment and the generated refund transaction is simply for the difference in value between the old and new tickets.**	This requirement needs to be considered against current and potentially future Settlement processes: simplicity for the traveller needs to be matched by simplicity (keeping costs down) on the RU Settlement and accounting side. If not, the industry could decide that the requirement is too costly.	N

5.6 Customer Information & Support

5.6.1 Post Journey Customer Support

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge

5.7 Controlling on Train

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge

5.8 Settlement & Reporting

5.8.1 Settlement

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	1213 1214 1215	TV RU	The requirement is for retailers (TVs or RUs) to receive one billing per settlement period only, covering all sales (domestic and foreign RUs) **SO THAT the retailer (TV or RU) can save costs by limiting the number of Rail settlement flows to monitor and reconcile.**	This may be a default case for many TVs today if they are relying on the flag-carrier RU for distribution of other domestic or foreign RUs. The risk is that this will multiply once domestic deregulation becomes a reality AND if each RU continues to have to support its sales operation by providing the accompanying settlement infrastructure.	N
2	1213	RU	The requirement is for RUs to receive/make a single remittance per settlement period. **SO THAT the RU can save costs by limiting the number of settlement flows to monitor and reconcile.**	Needs to be checked if this still makes sense for an RU who is both product owner and distributor/ retailer of other RUs.	N
3	1218	RU TV	The requirement is for distributors (RUs, GDSs or specialist Rail Agencies) to have access to a single system of agency (TV) identification which is accepted by all product owning RUs		N

| | | | SO THAT they do not have to maintain multiple identities for the same sales outlets depending on the product owning RU being sold;

And **SO THAT the settlement process can correctly bill the same sales outlet for sales on different RUs made via different distribution systems.** | | |

5.8.2 Reporting

Id	Ref	Req uirer	Description	Constraints and Confinements	TAP TSI Covera ge
1	1213	TV RU	The requirement is for retailers (TVs or RUs) who are reporting sales as input to the settlement process, to be able to report all sales in a single transmission to a single destination. **SO THAT the operational overheads of multiple transmissions can be reduced to the minimum.**	N.B. for international ticket vendors with operations in several markets, this suggests a pan-European settlement infrastructure	N
2	1213	RU	The requirement is for RUs to receive from a single source, one settlement hand-off report containing all their indirect sales (domestic and international). **SO THAT the RU can save costs by limiting the number of settlement flows to monitor and reconcile.**		N
3	1217	RU	The requirement is for the settlement hand-off report to RUs to be at individual 'sale' transaction level **SO THAT the RU can have transaction-by-transaction visibility: it enables them to effectively audit all their sales and reduce any errors of under- or over-collection – which can be important for the bottom line, validating sales forecast techniques, and monitoring the effects of revenue management initiatives.**	This requirement is expressed as a general principle, but specifically targets NRT sales which may be distributed via other RUs and for which the product owning RU has only summary and inauditable information from the settlement process (BCC).	N
4	1217	TV RU	The requirement is for the retailer (TV or RU) reporting sales into the settlement process, to report at 'confirmed booking' level grouped (where applicable e.g. multiple leg, single ticket) at Ticket sale level. **SO THAT the product owning RUs can receive the right level of detail for their auditing purposes, whilst the TVs can maintain Ticket Sale level for their auditing/monitoring process.**	Again, the distributed NRT sales process is targetted, but at the same time this establishes a general principle for Ticket Sales which may evolve into covering multiple bookings (multi-leg journeys under a single Ticket).	N

6 Gap Analysis TAP TSI – FSM

The TAP TSI gap analysis was done by iterating through each FSM requirement (column TAP TSI Coverage in the previous tables) and checking whether any of the TAP TSI messages is related in any way:

- If no relationship could be deduced a full gap was noted as 'N – Not covered'.
- If a TAP TSI seems to cover all or part of a requirement further analysis was done.
- If a requirement can be fulfilled completely it is denoted as 'Y – Fully covered'.
- Else the gap is marked as 'P – Partially covered' and an explanation is written if possible.

As the coverage by TAP TSI messages was found to be limited, it is more efficient to present the result of the analysis the other way round. For each TAP TSI message it is evaluated which requirements are fully or partially covered. The result is presented in a summary.

The evaluation of overall suitability of TAP TSI messages results in the following:

- None of the specifications supports online communication except for B.5.
- The overall structure of the messages inhibits the implementation of straightforward mapping logic.

1. TAP TSI B.1 (NRT message)

B.1 covers only a small part of FSM requirements. It will serve as template for the definition of offer messages. Since FSM requires that most of the handling will be on the carrier's side most of the B.1 attributes will be defined for the response message. That is B.1 does not support the FSM Offer-Booking workflow. It does not support dynamic changes of fares and contingents (yield management) either. It does not support after sales operations.

2. TAP TSI B.2 (IRT message)

A major set of global price attributes can be reused for the definition of Offer response messages. A critical aspect of IRT is the online check of availability and the provision of a preliminary book operation (including a time limit for booking). This is not supported by B.2. Post-sales operations are not supported either. In this way B.2 covers FSM requirements to a very small extent.

3. TAP TSI B.3 (Special Offer message)

The B.3 specification is not finished yet. B.3 may be used as a template for the specification of online-messages. It does not support availability check. The shortcomings of B.1 and B.2 apply to B.3 as well. That is B.3 does not cover FSM requirements sufficiently.

4. TAP TSI B.4 (Timetable data exchange)

The B.4 message does not fully support the assembly and merger of individual carrier timetables. The creation of an overall European timetable and the calculation of multi-carrier routes are not described. Hence most critical requirements of FSM are not covered.

5. TAP TSI B.5 (Seat/Berth Reservation message)

B.5 is defined as online message. The message may easily serve as template for the definition of FSM compliant messages. Nonetheless the requestor has to implement rail-specific logic in order to call for seat reservations. Hence some major FSM requirements are not covered.

6. TAP TSI B.30 (RU/IM exchange message)

RU/IM messages as defined by B.30 are intended to be used only internally to an RU. The message is not well suited to support passenger information prior to departure and during the journey. Almost none of the FSM requirements are covered.

7. TAP TSI B.7 (Print at home ticket format) and TAP TSI B.6 (RCT2 format)

The print-at-home format as defined by B.7 does not cover all FSM requirements. Three methods for creation of certificate (CMC, CKC and DST) are defined. They may support e-tickets to some extent. The printing of RCT2 tickets at the counter is fully supported by B.6. No other type of ticket or certificate is defined.

7 Non-Functional Requirements

Non-functional requirements comprise requirements which relate to the following subjects:

1. design and coding of software
2. integration of other services
3. testing of software
4. configuration and management of security
5. deployment and configuration of software and hardware
6. operating of software and hardware
7. management of incidents
8. management of changes and releases
9. management of service levels (availability, performance, capacity …)

7.1 Architecture

High-level description
The remit of the (FSM) is to build on the output of the TAP TSI work streams in order to address the full scope of passengers' needs when considering and planning a booking for and then undertaking a rail journey on European railways. The delivery of the FSM requirements in this document necessitates an enabling architecture. This Sub section presents a high-level overview of the main architectural features which would support an efficient and effective implementation of the FSM requirements, and identifies the gaps between the requirements and the architectural proposal delivered by the Architecture Work Stream of the TAP Phase One project. Further, the TAP TSI architecture does not cover the breadth of data provision that is required by the entire end-to-end process chain of the FSM as defined in this document. A full architectural requirements definition will be addressed in a follow-on phase of the FSM.

ID	Requirer	Functional objective	Gap to TAP TSI
1	TV	The architecture enabling the FSM requirements needs to support the efficient and effective exchange of various data types so that consumers receive sufficient information on rail journeys to make an informed choice between transportation modes, or on combining modes 1.1 The architecture needs to aggregate and make available timetable data from more than one source. It specifically needs to enable the seamless merger of timetable data from different railway undertakings (RU) in order to build routes and schedules from a combination of their services. 1.2 The architecture needs to provide access to all available static and dynamic (incl. yield-managed) railway tariffs and fares (including, but not limited to NRT, IRT, TLT/ train-linked tariffs) 1.3 The architecture needs to provide access to railway journey availability information in terms of fare and seat availability prior to individual traveller search requests for feasible travel options. The architecture needs to enable real-time updates for timetable and journey data in order to capture dynamic situations such as strikes, engineering	The TAP TSI architecture proposes a registry which only administrates a limited range of the data exchange on a one-to-one basis. Further, the TAP TSI architecture does not cover the need of the FSM for updates of changing information.

		works, train re-routings, cancellations (linked with 7.2).	
2	TV	The FSM architecture needs to provide adequate data quality management functionality to ensure that the data input is of sufficient quality to enable complex journey planning and fare construction functionalities. This requirement is specifically aimed at detecting and resolving contradictory timetable data for railway journeys provided by more than one source.	The TAP TSI architecture proposes a quality management tool which validates data quality source by source, but never comparatively or for schedules and routes combining two or more rail operators.
3	TV	3.1 The FSM architecture needs to enable access to Central Reference Data (CRD) which provides standardised codes for RUs (e.g. station codes) so that distributors and retailers may develop a common platform to display and offer rail products for and across European RUs. 3.2 An associated requirement is that the overall European railway timetable includes carrier codes for RUs so that requests for a journey offer can be assigned to one or more specific RUs.	TBA
4	TV	The FSM architecture needs to enable the communication with RUs' legacy systems where necessary, and should handle legacy standards that may be used by RUs (including, but not limited to, the architecture proposed by the TAP TSI project) so that (a) all legacy data and inventory systems can be effectively accessed, and (b) legacy data and proprietary booking actions can be mapped to a common, standardised workflow enabled by the FSM architecture to enable TV systems to have efficient processes.	Not covered by TAP TSI proposal
5	TV	The architecture needs to enable a generic ticketing and support process, abstracted from specific ticket delivery mechanisms, whereby: the product owning RU(s) are aware of all sales (including NRT sales via other RUs or TVs), and all sales are recorded in the RU system in a synchronous manner to ensure correct accounting. 5.2 the Ticket Control processes (and equipment) are upgraded in terms of interfacing with the ticketing processes of the financially responsible RU product owner, in order to update the status of individual journey leg entitlements as may be grouped under a single Ticket Reference (this may cover entitlements to services operated by other RUs depending on commercial agreement) 5.3 A unique repository may exist for electronic entitlements enveloped in a single ticket (multi-leg, multi-carrier) which are accessible by all authorised parties on behalf of the traveller so that e-Tickets do not need to be synchronised between systems, and the status of individual entitlements can be accurately interrogated for eligibilty for post-sale transactions. 5.4 Successful Post-sale transactions, regardless of	Not covered by TAP TSI proposal

		authorised source, can update a single instance of the electronic entitlement, for the benefit of all potentially interested parties. In addition, the architecture needs to support post-sale transactions requested and made during the journey (linked with 7.2, 7.3).	
6	TV	The FSM architecture needs to enable the settlement of all sales independent of RU and market. Specifically, it needs to enable a common settlement process with standardised procedures so that settlement is simplified for all participants (notably RUs and TVs). In addition, it needs to provide a scalable common infrastructure which is able to support and promote the growth of international and foreign sales.	Not covered by TAP TSI proposal
7	TV	The FSM architecture needs to enable the timely and efficient communication to the consumer of information related to a specific rail service prior, during and after a journey. 7.1 The architecture needs to provide access to rail booking details (incl. on-board facilities) 7.2 The architecture needs to facilitate real-time information to the consumer of any service changes (including, but not limited to timetable updates, delays, changes, cancellations) pertaining to a specific booking. 7.3 The architecture needs to facilitate the electronic processing of post-journey services required by a consumer from an RU (examples: returning unused portions of a ticket, claim for refund)	Not covered by TAP TSI proposal

7.2 Software Development

The management of the project and the development of the software have to be executed according to methodologies and procedures which have been mutually agreed by all participants. Management and development frameworks which are generally known and have been successfully and repeatedly established are preferred (e.g. PRINCE2, V-Modell).

Id	Description
	Organization of project • The organization must support the requirements of international participants. • Skills of team members must be checkable, persons must be exchangeable. • Responsibilities must be transparent to the customers.
Het	**Management of project** • Planning the project. The project must be planned according to procedures and templates which cover all aspects and are accepted by all parties. • Controlling the project. The controlling must take account of other closely related projects and a heterogeneous environment of organizations and systems.
	Development of software • Management of development environment. Most components will have a long life-cycle. It must be guaranteed that the development environment will dated up with major releases and can be taken over by other teams.

	• Management of versions and releases. The integration of legacy systems and applications which are developed by other projects demand near-time cycles and adequate documentation. • Documentation of architecture and design. Documentation must support efficient quality assurance of internal and external staff. • Management of quality. The results must meet internal and external requirements of steering and control.
	Testing software • Management of distributed tests. Tests have to be specified for and executed in a distributed and heterogeneous environment. They have to support overall tests. • Management of infrastructure (special care for system integration). The test systems have to simulate connected systems in their actual state. All types of integrated services and clients have to be instantiated or mocked up. • Release-tests and acceptance test must be based on the requirements and accepted change requests. Adequate procedures have to be established

7.3 Software Deployment

The software will consist of self-contained components which will be installed in different locations and at different companies. Functional interdependencies require development and control of a distributed deployment of applications.

Id	Description

	Planning the roll-out
	• Configuration of infrastructure. Experience and technical skills must embrace communication techniques and software development technologies to that extend that configuration items of
	    o Network
	    o Security
	    o Platforms
	    o Applications
	    o Administrative tools
	    o Communication frameworks
	can be planned in sufficient quality.
	• Capacity of infrastructure. The initial capacities and capacities at later stages of the software's life cycle have to be planned.
	• Installation sequence and start up. Tools and personnel must have the skills to make technical and functional tests. Plans and scenarios have to be specified according to agreed templates and procedures.

	Management of software deployment • Deployment procedures have to be aligned with all participants. • The overall process must be automated as far as is possible. The personnel must be trained to execute critical functional tests and check the technical and functional availability according to previously agreed requirements. • Final 'up and running' tests have to be defined and executed. They have to cover all scenarios which test the technical stability and availability and execute some critical operations. • The deployment of critical systems must be executed without any re-launch of a hardware or software component.

7.4 Change and Release Management

Due to a common communication backbone and a shared business workflow changes and releases must not be managed without close coordination of all integrated and

connected components. The processes have to be tightly linked to operating (chapter 7.6).

Id	Description
	Management of changes • Interdependencies of applications. The business workflows and some technical constraints require a careful and skilful alignment of changes. Knowledge of business and program code must exist or be established in very short time. • Controlling and steering of maintenance. The life cycle of the systems has to be aligned and an overall planning procedure has to be established.
	Management of releases • Interdependencies of releases. Some applications are not tolerant with respect to the integration of more than one version (old legacy systems), the new services will be able to handle that. The deployment and integration of new interfaces must be managed accordingly, procedures have to be developed. • Automated procedures have to be established due to very narrow intervals of system down-time.

7.5 Management of Service Levels

The undertaking deals with different types of services and operators of the technical infrastructure. The service levels will span a broad range and have to be fulfilled by operating tools of all participants.

Id	Description
	Alignment of service levels and agreements • The IT Service provider will be integrated in the definition and alignment of service levels. He must have skills to integrate a broad range of operators and existing agreements and tools. • Agreements will be made in different counties. Expertise is requested to deal with several legislative systems.
	Planning of operating and maintenance • The IT Service provider has to make evident that he has experience and skills to support the agreed service levels. • The service provider has to install tools and procedures which seamlessly integrate with other processes like change management and operating of systems and infrastructure.

7.6 Operating of Software and Hardware

The infrastructure consists of networks, security systems, computers and software. The communication backbone spans several countries and companies. The IT Service provider must fit in this landscape regarding his tools and skills.

Id	Description
	Monitoring • Integration with Service Level Management. Incidents of specified type have to be reported to service level management in an automated way. • Integration with administration and change management. Critical events have huge impacts on a large infrastructure and a number of business services. Procedures and tools have to be installed which fulfil the service levels at most in an automated way. • Tools and communication. The monitors will present states (in particular faults) which have to be communicated to other operators. Performance and effectiveness of these means have to

	be checkable by reference and test.
	Change and administration • Procedures for change of configurations and capacities. All procedures must adhere to agreed service levels and must be able to fulfil extended service levels. The migration of used tools must be seamless. • Procurement of resources. The IT service provider has to give evidence (ahead of deployment of the system) that he is able to upgrade the capacity of hardware in time. • Management of availability. Availability of services and clients will span a broad range. In particular the central and critical services have to be of high availability. • Management of security. Varying levels of security and security technologies (in other datacenters) have to be integrated and monitored.

7.7 Management of Incidents

The management of incidents will be an externalized service and has to be installed as variants (central services, 'leaf'-services like ticket vendor and carrier). Procedures, integration with operating and reporting may be proposed as part of an overall framework (e.g. ITIL).

Id	Description

	Integration
	• Procedures and tools have to be installed which seamlessly integrate with the following processes:
	    o Change management
	    o Service Level management
	    o Operating
	    o Software maintenance
	• Incoming and outgoing incidents have to be handled. Outgoing incidents must be delivered in alignment with the procedural and technical facilities of connected parties.

	Infrastructure and tools • Integration of international companies. The infrastructure and the tools must connect to a variety of other infrastructures and tools. All means must be state of the art in order to establish an automated integration. • Management of real-time services. Highly available systems which provide real-time service have to be monitored in a fully automated way. Incidents have to be handled immediately and by tools without intermediate manual action.

8 Appendices

8.1 Appendix A – Glossary

Term	Explanation
Alighting	The act by which a passenger gets out of a train
Attributing system	A reservation system performing the function of receiving reservation requests and sending replies
Boarding	The act by which a passenger gets on a train
Booking	The operation of obtaining the reservation of an accommodation on a train
Border station	A station that coincides with a Tariff border point
Carrier	Means the contractual railway undertaking with whom the passenger has concluded a transport contract or a series of successive railway undertakings which are liable on the basis of such a contract (1)
City	See Metastation
Coach group	Group of one or more coaches that do not run for the whole route of a train. They can be pulled by a single train but only for part of its route, or they can be pulled by one train for part of their route and then be disconnected from that train and coupled to another
Couple (a coach (group))	Attach a coach group to a pulling train
CRD	Common Reference Database – The reference file for locations referred in TAP 4.2.xx
Data user	A stakeholder authorized to download the timetable data of one or more RUs, under usage conditions
Days of operation	A conventional representation used to indicate in which days of a given time period a service is present or not. It consists of a string of as many digits as there are days in the given time period, with value 1 for the days when the service is present and value 0 for the others). When the time period is one week, for patterns repeated equally every week, it is possible to use the alternative representation of the "working week" (see)
Disconnect (a coach (group))	Detach a coach group from one pulling train that continues its journey, because the coach group has reached its final destination or because it must be coupled to another train
Distribution channel	Means the method (such as ticket office machine, on-train media, public web services, telesales, mobile ticketing) by which a service (information, ticket sale, ticket refund, response to complaints, etc.) is provided to the passenger by a railway undertaking (1). Complementary info: the service can be provided to the passenger by a railway undertaking directly or through a distributor and/or a travel distribution enabler and/or a retailer
FSM	Full-Service Model Work Stream of the TAP Phase One project
FTE (Forum Train Europe)	A series of meetings (normally two per year) where the European RUs and IMs plan the International trains for the following year
Global price	A modality of establishing the price of a rail ticket where it includes in a single undifferentiated amount the contract of carriage, the reservation and any possible supplement. It is the kind of pricing used for IRTs. (synonym : Market price)
IFOPT	Identification of Fixed Objects in Public Transport IFOPT defines a model and identification principles for the main fixed objects related to public access to Public Transport (e.g. stop points, stop areas, stations, connection links, entrances, etc.)
IM	Infrastructure Manager
Information provider	
IRT (Integrated	Ticket which is issued as an international or national ticket and in which a

Reservation Ticket)	compulsory reservation is integrated (2)
Itinerary segment	Section of the route of a train, usually defined in order to describe service elements and facilities that are available for only part of the route. Synonym: travel segment
Joining to	The operation by which two trains, having run separately until now, meet in a station and are there coupled to each other to continue the journey together but keeping each its original train number
Joint carrier	Means a carrier linked by a cooperation agreement to one or more other carriers for the operation of a transport service (1)
Metastation	A grouping of rail locations that must be collectively considered by a journey planner, when the user inserts the name of the meta station (synonym : City)
Multiple variation	
NEB (National Enforcement Body)	Organizations designated by each member State, according to art. 30 of Regulation 1371/2007, to guarantee its good application. The list of NEBs is on http://ec.europa.eu/transport/passengers/rail/rail_en.htm
NRT (Non-integrated Reservation Ticket)	Ticket which is issued as a national or international coupon without a reservation integrated with it for journeys for which reservations are not required (2)
Operator	The carrier operating a train for (part of) its route
Passenger type	A code, and the corresponding definition, identifying the characteristics of one or more rail passengers (e.g. Adult, Senior, Family group). Valid values are listed in ERA Code list B.4.5261
PRM	Passengers with reduced mobility
Product	Means a type of train with determined types of services (e.g. high speed, bicycle storage places, PRM accommodation, couchette and/or sleeping cars, dining cars, take-away facilities, etc.) which are linked to relevant prices and may be linked to specific conditions (1)
PRR	Regulation (EC) No 1371/2007 of the European Parliament and of the Council of 23 October 2007 on rail passengers' rights and obligations
Pulling Train	The train to which a coach group is coupled
Registry	A tool made available by the TAP governance body to keep track of all resources made available by resource producers, that the authorized resource consumers can consult to find at which address the resource can be found and by which method it can be accessed
Reservation provider	The railway company, which is responsible for the reservation of a train
Routing station	A station where a train passes by without stopping, that is included in the schedule of that train to help match the timetable data to the tariff data
RU (Railway Undertaking)	Means any public or private undertaking the principal business of which is to provide services for the transport of goods and/or passengers by rail, with a requirement that the undertaking must ensure traction; this also includes undertakings which provide traction only (1)
Schedule	The timetable data related to a specific train, with its origin, transit and destination stations and the corresponding times of departure, arrival and passage
Service brand	A code, and the corresponding definition, identifying a commercial family of trains (e.g. AVE, Thalys, RailJet). Valid values are listed in ERA Code list B.4.7009 (together with Service modes)
Service extra	A code, and the corresponding definition, identifying a service offered by an RU on board of its trains (e.g. lunch, movies). Valid values are listed in ERA Code list B.4.7161
Service facility	A code, and the corresponding definition, identifying an accommodation available on a train (e.g. First-class seats, Second-class sleeper T4) or a utility available in a station (e.g. Metro connection, Bus connection). Valid values are listed in ERA Code list B.4.9039
Service mode	A code, and the corresponding definition, identifying a generic type of train (e.g. Intercity, Regional) or a transport mode different from Train (e.g. Bus, Ship). Valid values are listed in ERA Code list B.4.7009 (together with Service brands)
Service number	The number identifying a given transport service (train or coach group) offered in the timetable of an operator

Service provider	The responsible entity providing any services linked to the transport of passengers". The service provider is responsible for the terms and conditions and for the fares valid on the service and is often identical with the operating carrier
Single variation	
SIRI	Service Interface for Real Time Information SIRI is an XML protocol to allow distributed computers to exchange real-time information about public transport services and vehicles. SIRI is based on the Transmodel abstract model for public transport information
Sole carrier	Means a carrier that operates a transport service independently of other carriers (1)
Splitting from	The operation by which two trains, having run until now coupled to each other but with different train numbers, stop in a station and are divided from each other to continue separately their journeys keeping each its original train number
Substation	A substation is a part of a station. For example, part of a station can be dedicated to high speed traffic, another to regional traffic and another to urban traffic
Tariff border point	A conventional location used to indicate where the responsibility of the passenger is passed from one RU to the next one in case of successive carriers
TCV (Tarif Commun Voyageurs)	A commercial agreement by various carriers to allow use of NRT tickets on the trains they operate
Timetable	A structured list of data describing the transport services offered to the public by a transport company (in this case a Railway Undertaking) during a given time period
Time zone	A region on Earth that has a uniform standard time
Transmodel	A reference data model for Public Transport operations developed within several European projects.
TV	Ticket Vendor, being a third party Retailer, third party Distributor or an RU acting as a Retailer or Distributor of rail tickets
Variant (train -)	
Working week	A conventional representation used to indicate in which days of a week a service is present or not, as an alternative to the generic method of the "days of operation" (see). The days from Monday to Sunday are indicated with the digits 1 to 7, and only the digits corresponding to the days when the service is present are listed)

(1): from the TAP glossary
(2): from the CIT glossary

8.2   Appendix B – The FSM Matrix

Full Service Model Consolidated v01.xlsx