

## INFORMATION TECHNOLOGIES FOR SHIFT TO RAIL

### D8.7 - Dissemination and Exploitation activities and impact on standardisation and regulation

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## EXECUTIVE SUMMARY

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This document provides a description of the IT2Rail dissemination and communication activities carried out during the whole duration of the project. The aim of this report is to provide a detailed description of the dissemination strategy and how this was implemented during the 36 months of project implementation, including the materials and strategies that have been used to facilitate the wide-spread of information and knowledge of the results created by the project. The dissemination of IT2Rail is essential throughout the project's life and need to be carried out with the cooperation of all Work Packages.

In this respect, materials and strategies that were used for communicating and disseminating IT2Rail to the target audiences and the general public, as described in the dissemination plan (D8.4), are presented in this report. Those include: the creation of a project identity; the creation of a public website; the creation of a project brochure; the production of two newsletters; the organisation of dissemination events; the participation to conferences and the publication of results in relevant journals/conferences.

Moreover, this report includes an outlook on relevant standards for IT2Rail, along with an overview of the consultative bodies that have been created during the life of the project.

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## LIST OF ABBREVIATIONS

<b>CCA:</b>	Cross-cutting themes and activities
<b>AB</b>	Advisory Board
<b>AFNOR</b>	Association Française de Normalisation
<b>API</b>	Application Program Interface
<b>B2B</b>	Business-to-Business
<b>CCMC</b>	CEN CENELEC Management Centre
<b>CEN:</b>	European Committee for Standardisation
<b>CENELEC:</b>	European Committee for Electrotechnical Standardisation
<b>CEPT</b>	European Conference of Postal and Telecommunications Administrations
<b>CFM</b>	Call For Members
<b>D2D:</b>	Door-to-Door
<b>DIN</b>	Deutsches Institut für Normung
<b>ECC</b>	Electronic Communications Committee
<b>EDIFACT</b>	Electronic Data Interchange for Administration, Commerce and Transport
<b>EG</b>	Expert Group
<b>EN:</b>	European Norm
<b>EPSCG</b>	Ethical, Privacy and Security Expert Group
<b>ERA:</b>	European Union Agency for Railways
<b>ESO</b>	European Standardisation Organisation
<b>ETSI</b>	European Telecommunication Standards Institute
<b>EU:</b>	European Union
<b>EUG</b>	End Users Expert Group
<b>FSM</b>	Full Service Model
<b>GDPR</b>	General Data Protection Regulation
<b>GTFS</b>	General Transport Feed Specification
<b>HAS</b>	Harmonised Standard
<b>IEC</b>	International Electrotechnical Commission
<b>IP:</b>	Innovation Programme
<b>ISO</b>	International Organisation for Standardisation
<b>IT</b>	Information Technologies
<b>IT2Rail</b>	Information technologies for Shift2Rail
<b>ITSO</b>	Integrated Transport Smartcard Organisation
<b>ITU</b>	International Telecommunication Union
<b>JU</b>	Joint Undertaking
<b>MAAP</b>	Multi Annual Action Plan
<b>NAC</b>	New Approach Consultant
<b>NSB</b>	National Standardisation Body
<b>OC</b>	Open Calls
<b>OJEU</b>	Official Journal of European Union
<b>OMTS</b>	On-board Multimedia and Telematics Subsystems
<b>PRM</b>	People with Reduced Mobility

<b>RSP</b>	Rail Service Provider
<b>RU</b>	Railway Undertaking
<b>S2R</b>	Shift2Rail
<b>SDO</b>	Standards Developing Organisation
<b>SIRI</b>	Service Interface for Real-time Information
<b>SLG</b>	Strategic Liaison Group
<b>SRDoc</b>	System Requirements Document
<b>TAP</b>	Telematics Application for Passenger Services
<b>TCMS</b>	Train Control and Monitoring System
<b>TCN</b>	Train Communication Network
<b>TD</b>	Technology Demonstrator
<b>TR</b>	Technical Report
<b>TRA:</b>	Transport Research Arena
<b>TS</b>	Technical Specification
<b>TSI</b>	Technical Specification for Interoperability
<b>UIC</b>	International Union of Railways
<b>VDV</b>	Verband Deutscher Verkehrsunternehmen
<b>WCRR:</b>	World Congress on Railway Research
<b>WP:</b>	Work Package
<b>XSD</b>	XML Schema Definition

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## 1. BACKGROUND

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### 1.1 INTRODUCTION TO IT2RAIL

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IT2Rail is a thirty-six-month project, funded by the Horizon 2020 programme of the European Commission. IT2Rail is a first step towards achieving the objectives of the long term Shift2Rail Programme. More specifically, the 4<sup>th</sup> Innovation Programme (IP4), focusing on “IT Solutions for Attractive Railway Services”. The overall aim is to provide a new seamless travel experience, giving access to a complete multimodal travel offer which connects the first and last mile to long distance journeys by:

- Transforming global travel interactions into a fully integrated and customised experience;
- Providing a door-to-door (D2D) multi modal travel experience, through services distributed by multiple providers;
- Helping operators to adapt their level of service, better to satisfy customer expectations and optimise their own operations.

The difference between IT2Rail and Shift2Rail IP4 is that the former simply represents the first stage (a subset) of the latter. As such, IT2Rail lays the foundations in terms of the IP4 technical framework and the relevant business applications which use the framework to solve the interoperability issues confronting external communications.

IT2Rail scope is pitched at a much smaller scale than that of IP4, in line with respective budget allocations and in terms of the following dimensions:

- depth of functionality;
- geographical coverage in terms of passenger-flow ‘corridors’;
- number of transport modes;
- number of transport operators;
- full end to end coverage of travel ‘processes’ i.e. re-accommodation, after-sales transactions and payment/settlement solutions are not tackled in IT2Rail and are topics which are left for subsequent and dedicated IP4 calls.

Even though the scope of IT2Rail is reduced in comparison to IP4, the work is organised around the six Technology Demonstrators (TDs) that can be found in IP4 and are essentially equivalent to the Work Packages 1-6 shown in figure 1. This will facilitate the knowledge transfer from IT2Rail to S2R even more as it creates a direct link.

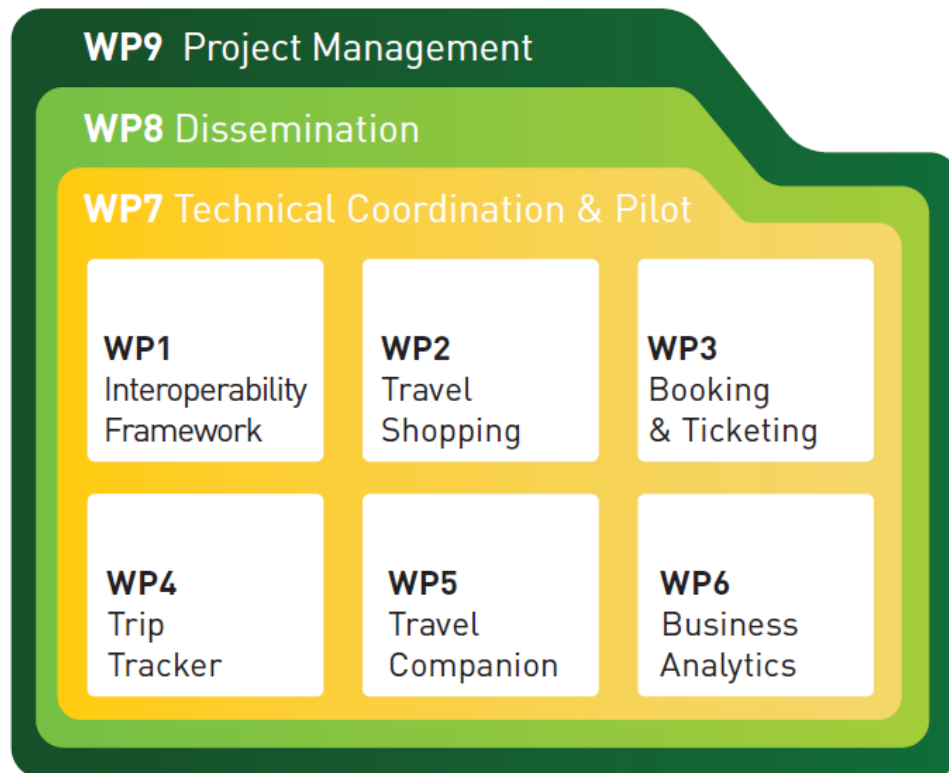


Figure 1: Project Organisation

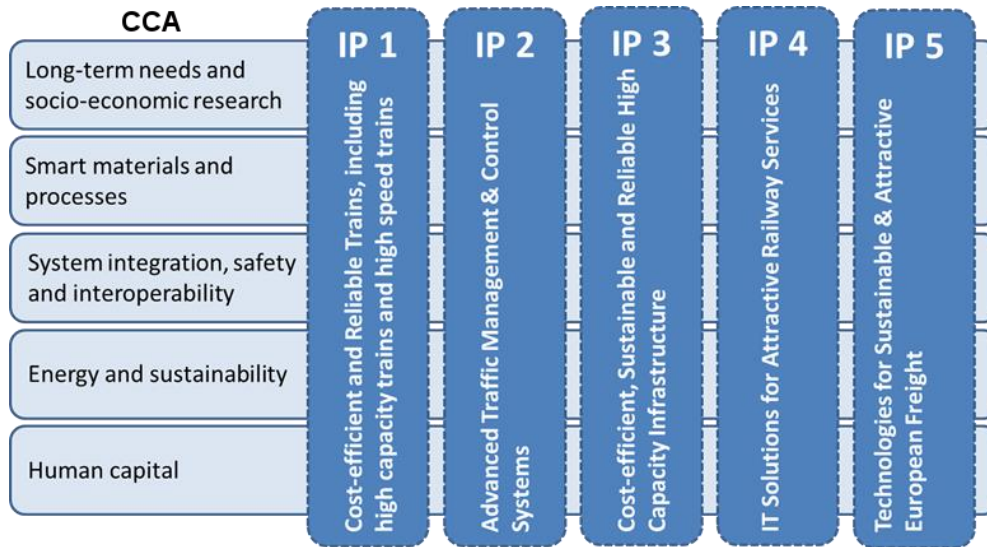
## 1.2 SHIFT2RAIL

The Shift2Rail Joint Undertaking (JU) is the first public-private European rail technology partnership that aims at building the railway systems of tomorrow. This initiative is fully operational since 2016 and seeks focused research and innovation by accelerating the integration of new and advanced technologies into innovative rail product solutions.

The work of Shift2Rail is structured around five Innovation Programmes (IPs) that cover all of the different structural and functional areas of the rail system as well as five cross-cutting themes (CCA).

One of the Shift2Rail's main outcomes will be the demonstration activities (e.g. technology developments in lab to system prototype demonstrations in operational environments).





**Figure 2: Overall structure of the S2R JU programme (Source: S2R MAAP, 2015)**

The IT2Rail communication and dissemination strategy has been designed to provide the most extensive coverage, meeting the limitation of the scale of the project and ensuring an efficient and co-ordinated take-up by the Shift2Rail JU with their future R&D activities. The activities are also designed to ensure a solid communication of the project with actors outside of the Shift2Rail JU. The overall approach, which also reflects the way in which this document is structured, focuses on the following four elements:

1. Public dissemination aligned with the Shift2Rail JU dissemination objectives and strategy;
2. Interaction with the Shift2Rail JU of the IT2Rail results;
3. Focus on consultative bodies; and
4. Possible contributions to standards and regulation.

The first element focused on the wide dissemination of project results through several means like publications, creation of a public website, attendance and presentations in various events etc., which will be described in more detail throughout this document.

The second element focused on the link with and dissemination of appropriate results to the future Shift2Rail Research and Development activities. For this purpose, two detailed reports have been created (D8.5 and D8.6) describing the interactions with Shift2Rail and the Reusability and Enhanceability of the IT2Rail outcomes. These two reports represent the intermediate report on the use of the results by Shift2Rail and the equivalent final report respectively.

The third element was also very much developed, as a number of consultative bodies were created and run during the whole duration of the project. More specifically, one Advisory Board and two Expert Groups were created.

Last, an analysis of the Standardisation and Regulation activities relevant to the IT2Rail developments was also carried out and the resulting report of this analysis is also included in this document.

## 2. EXTERNAL COMMUNICATION

External communication was of key importance for maximising IT2Rail's impact and for disseminating the project results. Communication of the project research activities involved reaching relevant transport stakeholders, the scientific community and creating awareness among the general public. This has been achieved through creating a project identity and a public website, attending to conferences and relevant events and publishing articles in relevant journals.

### 2.1 PROJECT IDENTITY

A project identity has been created at the beginning of the project including templates for presentations, reports, a project brochure as well as the IT2Rail logo. The project identity considerably helped dissemination activities and ensured a consistent communication of the project concept, objectives and results. The brochure has been distributed at project workshops and conferences, where project partners have participated, and it can also be downloaded from the IT2Rail public website.



Figure 3: IT2Rail Brochure

## 2.2 WEBSITE

A dedicated website was created at the beginning of the project and has been updated throughout the life of the project. The website (<http://www.it2rail.eu>) is publicly accessible, with a section where visitors can register their interest. It is divided into two parts: the public portal and the cooperation tool (member's area), which acts as an exchange platform between the project partners.

The public portal is open to the public and displays the key project information, partners, results, news/events and links to the partners' websites. All the public deliverables are published on the website and are available for download.

The public webpage also lists related projects and includes their links, as well the links to the Shift2Rail website and the related "lighthouse projects" (Roll2Rail and In2Rail).



Figure 4: IT2Rail Public Website homepage

Below you can also find the website statistic of the IT2Rail website, showing the amount of new and returning visitors throughout the life of the project, as well as the countries from which they connected.

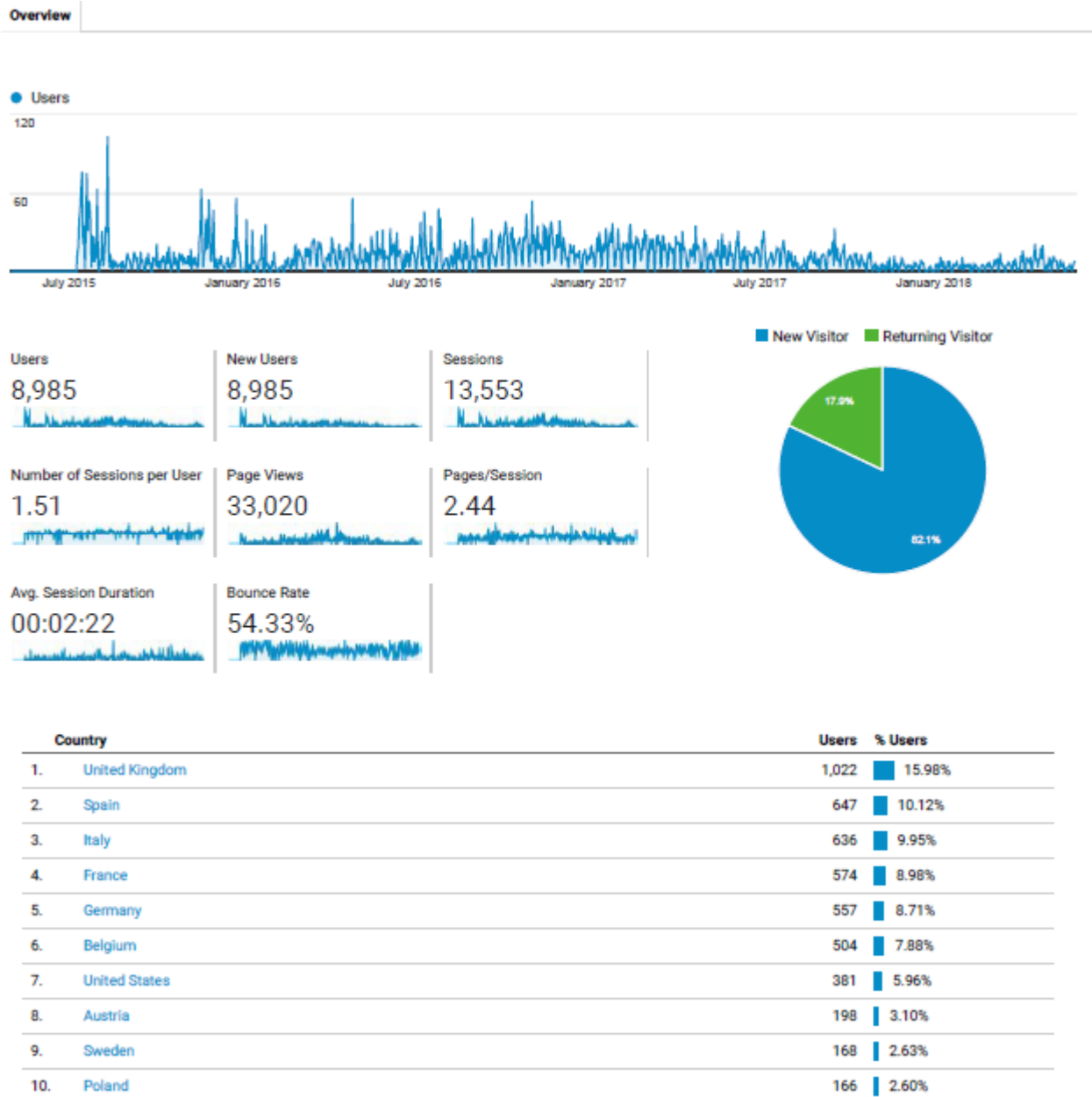


Figure 5: Statistics of IT2Rail Public Website



## 2.3 NEWSLETTER

The project has produced two newsletters, one towards the middle of the project and another one in the end of the project, providing up-to-date information on the status and achievements of the project.

The first newsletter was released in conjunction with the Mid-term event which took place in November 2016 in Brussels.

The second newsletter was produced at the end of the project. Both of the newsletters are available for download on the IT2Rail public website.



Figure 6: Front page of IT2Rail Newsletters

## 2.4 EVENTS

The IT2Rail consortium has organised two major project events: a Mid-term Conference in November 2016 and a Final Conference in April 2018.

- **IT2Rail Mid-term Conference.** IT2Rail organised a joint Mid-term event together with the other three lighthouse projects Roll2Rail, In2Rail and SmartRail. After a common high-level morning session, more than 50 participants attended the IT2Rail afternoon part where the main results in the first half of the project were presented. The main objectives of the event were:
  - To enable other stakeholders not being directly involved in the project to be updated on the intermediate results of the project, as well as on the various challenges faced until that moment;
  - To hold technical and scientific exchanges among IT2Rail partners, members of the Consultative Bodies and the public;
  - To get the feedback from the audience with respect to the potential for the implementation of the proposed solutions.



Figure 7: Pictures from the IT2Rail Mid-term Conference

- IT2Rail Final Conference.** The IT2Rail Final Conference took place on the 18<sup>th</sup> April in Vienna, taking advantage of the Transport Research Arena (TRA2018) also taking place in Vienna during that same week, therefore securing the participation of over 60 experts from around Europe. The event was the occasion for project partners to showcase the various functionalities that have been developed in the IT2Rail project, followed also by a short demonstration. The conference participants also had the opportunity to be involved in the discussions through the panel and interactive sessions that were planned, which focused on key aspects of the project. The event closed with an overview of the project outcomes and main innovations, followed by a brief introduction on how the results will be taken further by the currently running and future Shift2Rail projects. This link with Shift2Rail was showcased even further the next day, during the combined event with the other three Shift2Rail lighthouse projects Roll2Rail, In2Rail and SmartRail, which also took place in Vienna.



**Figure 8: Pictures from the IT2Rail Final Conference**

To find out more about the IT2Rail Final Conference, please refer to deliverable D7.7 “Pilot completion report”, which, on top of the pilot analysis, also includes a chapter that describes how the Final Conference was structured, along with a detailed attendance list showing the people that participated.

## 2.5 PRESENTATIONS & PUBLICATIONS

Project results have also been published on several specialised magazines, scientific journals and in relevant national and international conferences and workshops. IT2Rail has actively looked-out for high profile academic and industrial events that are within the domain of interest of the project. At the end of the project, IT2Rail has been presented/published in the following events and press:

Event/Publication	Title	Authors
<b>Publications</b>		
Komunikacja Publiczna (Polish magazine), August to October 2015 issue	Projekty europejskie jako źródło przewagi konkurencyjnej operatorów i zarządów transportu - European projects as a source of competitive advantage for operators and transport boards	Marta Góralczyk and Arthur Perchel (UITP)
EUROPEAN RAILWAY REVIEW, VOLUME 22, ISSUE 3, 2016	IT2Rail – Transforming Real-Time Passenger Information and ticketing	Stefanos Gogos (UNIFE)
WCRR2016, 29 May-2 June, Milan	IT2Rail paper – Information Technologies for Shift to Rail	Stefanos Gogos (UNIFE), Xavier Letellier (THALES)
	The “open web of transportation data” as a shared networked environment for the realization of the Single European Railway Area	Riccardo Santoro (Trenitalia), Eric Lavillonner (Mitsubishi), Clive Roberts (University of Birmingham), Paolo Umiliacchi (CNC) – Award Winner
TRA2016, 18-21 April 2016, Warsaw	IT2Rail: information technologies for shift to rail	Stefanos Gogos (UNIFE), Xavier Letellier (THALES)
<b>Events</b>		
ICT on TRAINS, 8-9 September 2015, Birmingham	IT2Rail presentation	Evelyn Furui (THALES)
IT-TRANS, 1-3 March 2016, Karlsruhe	IT2Rail presentation	Jürgen Ross (VBB), Michael Pellot (TMB)
TRA2016, 18-21 April 2016, Warsaw	IT2Rail presentation	Stefanos Gogos (UNIFE)
WCRR2016, 29 May-2 June 2016, Milan	IT2Rail presentation	Stefanos Gogos (UNIFE)
	Presentation of paper that included IT2Rail outcomes	Riccardo Santoro (TRENITALIA)



Transport Public, 16 June 2016. Paris	IT2Rail presentation at UITP stand	Cristina Hernández (UITP)
Innotrans2016, 20-23 September 2016, Berlin	IT2Rail presentation at UNIFE stand	Stefanos Gogos (UNIFE), Laurent Laudinet (THALES)
Smart Ticketing Alliance workshop, 27 October 2016, Brussels (UITP premises)	New era of e-ticketing – How to handle the transition? Session: Open interfaces in ticketing and information (IT2Rail)	Laurent Laudinet (Thales), UITP support
UITP Global Public Transport Summit, 15-17 May 2017, Montréal	IT2Rail presentation	Guido Di Pasquale (UITP)
UNIFE General Assembly 21-23 June 2017, Barcelona	IT2Rail presentation	Stefanos Gogos (UNIFE)
IT-TRANS, 6-8 March 2018, Karlsruhe	IT2Rail presentation	Guido Di Pasquale (UITP)
TRA2018, 16-19 April 2018, Vienna	IT2Rail presentation at S2R stand	Stefanos Gogos (UNIFE)

**Table 1: Targeted Publications and Conferences**

In addition, the project has also been disseminated through the traditional dissemination channels of each partner, e.g.:

- UITP website: Aprox. 30,000 sessions/month; 20,000 users/month; targeting Public transport stakeholders.
  - o Dedicated webpage to IT2Rail: <http://www.uitp.org/it2rail-information-technologies-shift2rail>;
  - o A year in EU-funded projects. 17/12/2015;
  - o When in IT-TRANS, learn about IT in EU projects. 19/02/2016;
  - o Made-to-measure mobility: Transport public 2016. 07/06/2016.
- UITP My Library (online database). It includes a summary of the project, the project's leaflet and newsletter and key public deliverables. Aprox. 14.000 users; targeting Public transport stakeholders.
- UITP newsletters: Different articles with reference to the project, e.g.
  - o UITP Combined Mobility Newsletter n° 4 – October 2015. Article: NEW EU PROJECT: IT2RAIL – INFORMATION TECHNOLOGIES HEADING FOR EUROPEAN INTER-MODALITY;

- UITP Information Technology newsletter n° 3 – December 2015. Article: UITP TO LEAD PILOT DEMONSTRATION OF IT2RAIL PROJECT;
  - UITP EU-Express newsletter n° 43 – April 2018. Article: LATEST NEWS FROM THE RESEARCH AND INNOVATION DEPARTMENT;
  - UITP EU-Express newsletter n° 44 – May 2018. Article: LATEST NEWS FROM THE RESEARCH AND INNOVATION DEPARTMENT;
  - UITP EU-Express newsletter n° 45 – June 2018. Article: LATEST NEWS FROM THE RESEARCH AND INNOVATION ACTIVITIES.
- UITP magazine (PT magazine n° 1/2016): specific dissemination based on the logo – Rail projects.



Figure 9: Page dedicated to rail projects dissemination. UITP magazine PT 1/2016

### 3. INTERACTION WITH SHIFT2RAIL

As mentioned in the introduction, in order to ensure the interaction with Shift2Rail, two detailed reports have been created (D8.5 and D8.6) describing the interactions with Shift2Rail and the Reusability and Enhanceability of the IT2Rail outcomes. These two reports represent the intermediate report on the use of the results by Shift2Rail and the equivalent final report respectively. The reports explain the role of the specifications and the model in IT2Rail, giving an overview of the usage and procedures of the (Capella) model. Then, a description of the functions and components is included for each WP, along with how these will be reused and enhanced in other Shift2Rail projects. The reports finish with some lessons learned, along with a summary of the contributions towards the objectives of Shift2Rail IP4. For more details, please refer to D8.6, which is the “Final report on the use of the results by S2R”.

On top of the abovementioned reports, two collaboration workshops took place on the 03-04 May 2017 and on the 14-15 December 2017. These collaboration workshops brought together the actors involved in the various IP4 projects, together with IT2Rail partners.

The first collaboration workshop was split into two sessions, with each session lasting one day. The first day focused on giving an overview of the various IP4 projects, in order to be able to understand better the needs for reusing and enhancing the outcomes of IT2Rail. The various collaboration processes were then discussed the following day, along with any additional collaboration needs between the different IP4 projects.

The second collaboration workshop was also split into two sessions of one day each. The first day focusing on the analysis of IT2Rail results relevant for each TD of IP4, also identifying common grounds and tools with the other IP4 CFM projects. The second day was dedicated to the collaboration between the IP4 CFM and the IP4 OC projects, identifying the need for Collaboration Agreements, along with the possible needs for common tooling and processes.

### 4. CONSULTATIVE BODIES

IT2Rail has established three Consultative Bodies: the **Advisory Board** (“AB”) and the 2 Expert Groups (“EG”s) – **EG Ethical, Privacy and Security** and **EG End Users**. Their scope, along with their specific challenges and areas of focus is explained briefly in the following sections.

#### 4.1 ADVISORY BOARD

The Advisory Board (onwards AB) was embedded within the IT2Rail core structure to maintain access to ‘the pulse of the market’ and to allow a pro-active attitude to e.g. other stakeholders’ conditions, technological developments and business models. The main areas that the AB members were asked to focus on were:

- to give expert advice and recommendations, especially considering modifications and recommendations concerning the project monitoring;

- to provide recommendations on the use of innovative solutions, legislation issues and technical harmonisation, strategic developments concerning both the project partners and other relevant stakeholders;
- to help disseminate information about the project development at the highest level amongst relevant stakeholders.

Three AB meetings took place throughout the life of the project, as originally planned. For more details on the outcomes of the AB meetings, please refer to D8.9 – “Conclusions and Recommendations of the Advisory Board”.

## 4.2 EXPERT GROUPS

In terms of the two Expert Groups that were created, there was one dedicated to aspects related to End Users and another one dedicated to ethical, privacy and security aspects.

1. The End Users Expert Group (onwards EUG), composed mainly of transport operators'/organising authorities' representatives (both urban and mainline), was created to help clarify the various situations in terms of market needs, constraints and opportunities at EU level, to advise during the mid-term discussions and to make recommendations and to comment on the expected outcomes of the project and the follow-up. Significant importance was given to:
  - the use of data (e.g. data consolidation and quality, data exchange and data sharing between stakeholders, guarantees on the right usage of data, how to qualify the data, what is the relationship with 'open data', etc.); and
  - the potential impact of the new systems and services on passengers, including their acceptance levels.
2. The Ethical, Privacy and Security Expert Group (onwards EPSG), made of Ethical, Privacy & Security experts, dealt with ethical issues and the protection of individual rights. Due to the nature of the project, there was a need to ensure the compliance with the ethical and legal requirements linked to the privacy and data protection issues, compliance with the EU privacy and data protection legislation, ethical and societal acceptance, as well as any other relevant aspects that were at stake;

Even if each group was focused on specific aspect, some issues were pointed out by both groups, in particular compliance with the General Data Protection Regulation (also called GDPR) and the data sharing. Therefore, some points were discussed in both Expert Groups.

These Expert Groups were liaised with the IT2Rail Management Committees and relevant Work Packages when necessary.

The EPSG's final schedule confirmed 3 face-to-face meetings, preserving time for conference-calls to discuss internally the final results and the achievements. The EUG's final schedule confirmed 4 exclusive meetings, preserving the last one to invite the EUG experts to the IT2Rail final event.

For more details on the outcomes of the EG meetings, please refer to D8.8 – “Conclusions and recommendations of the Experts’ Groups”.

## **5. POSSIBLE CONTRIBUTIONS TO STANDARDS AND REGULATION**

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Through the activities that were carried out by the consultative bodies mentioned in the previous chapter, various experts in standardisation-related aspects were involved, making sure that the project received the appropriate advice and guidance whenever needed. Together with some project partners and as part of task 8.4, an analysis of the possible contributions to standards and regulation was also done, the outcomes of which is outlined in this chapter of the report.

### **5.1 INTRODUCTION**

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The common meaning of the word “standards” is in fact referring to a variety of documents which are shared for common applications by the stakeholders of a given sector. Since the word is also formally referring to “standards” produced by officially recognised bodies such as the European Standardisation Organisations (ESOs) namely CEN, CENLEC and ETSI at EU level and the Standard Developing Organisations (SDOs): ISO, IEC and ITU at international level, this document has adopted the term “specifications” in order to refer to available documents irrespective of the fact if they are published by ESOs or SDOs or other organisations. Based on the focus of IT2RAIL and Shift2Rail, this approach enables the document to group the specifications into three chapters as follows:

### **5.2 SPECIFICATIONS WHICH ARE LEGAL REQUIREMENTS AND LEGALLY BINDING.**

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The “Legal requirements for passenger travel” result from Directives or Regulations produced by the European Union or the European Commission (in case of delegated acts), some of which are directly European railways related like the TAP TSI and PRM TSI, and other related to transverse issues like “Personal data protection and privacy”. In the rail sector, the EC is supported by the European Union Agency for Railway (ERA, see: <http://www.era.europa.eu/Pages/Home.aspx>). In the case of Telecom related requirements, they are issued by the ECC (at EU level) and CEPT (covering 48 countries including EU Member States).

Most EU Member States also issue legal requirements, either resulting from the transposition of EU directives in national legislation or as being specific to the country. As an example, in UK the Rail Settlement Plan (RSP) company is producing numerous RSPA and RSPS. Similarly, for ticketing in Germany VDV is producing VDV kern applications and UK the ITSO specifications.

On 5 May 2011, the European Commission formally adopted the Telematics Applications for Passenger Services Technical Specifications for Interoperability (TAP TSI). It entered into force on 13 May 2011 as the Commission Regulation (EU) No 454/2011. Please follow the link to access the listed documents belonging to the set of Technical Documents described in Annex III of the Commission Regulation (EU) No 454/2011.



The Telematic Applications for Passengers Technical Specification for Interoperability (TAP TSI) will allow the harmonisation/standardisation of procedures, data, and messages to be exchanged between the computer systems of the railway companies, of the infrastructure managers and of the tickets vendors to provide reliable information to passengers and to issue tickets for a journey on the European Union railway network, in accordance with rail passengers rights and obligations. The TAP TSI is also proposing in clause 4.2.21.1 a common information exchange architecture. Many services specified in the TAP TSI require and assume that a communication link between the train and ground systems is available. A Communications link is part of the general information exchange architecture which are shared between all on-board application services. Over time such services will become more reliant on the availability of a continuous and reliable connection between trains and ground systems. The implementation of the TAP TSI is widely supported, however the protocols are currently based on the EDIFACT (Electronic Data Interchange for Administration, Commerce and Transport) standard published over 30 years ago and not reflective of the current state of art for information message exchanges.

Outside of scope in gathering these standards has been those associated with cyber security, and specific IT based standards e.g. modelling based standards such as railML or Ontology based specifications.

### **5.3 STANDARDS ESTABLISHED BY THE EUROPEAN AND INTERNATIONAL STANDARDISATION BODIES.**

The European and International standardisation bodies are producing a very big amount of specifications which are categorised as “Standards” with the prefix “EN” or “ISO” or “IEC” followed by a number, or as other documents like:

- TR (Technical Report), which are published when the relevant developing body cannot set requirements on the matter but wish to offer the available knowledge;
- TS (Technical Specification), which contains requirements but, for the time being, the required support for approval as a European Standard cannot be obtained and the subject matter is still under technical development.

The production of these documents is following rather complex procedures implying acceptance from National Standardisation Bodies (the “NSBs”) like AFNOR, in France, DIN in Germany etc., which also produce their own national specifications. However, the national specification cannot be published or, if existing, shall be withdrawn when they specify requirements which are in contrast with or overlapping the ESO specifications.

These documents are produced (on their own budget) by volunteering experts from the relevant market stakeholders who are registered in Technical Committees or Working Groups managed by the standardisation bodies (for ESOs and SDOs, usually based on proposals made by NSBs).

For telecom specifications (produced by ETSI) the process is also very specific with a variety of documents like SRDoc (System Requirements Document), TR etc.

The standards and other documents produced by standardisation bodies are of voluntary use by the market actors, except when the case hereinafter applies. Usually standards, on paper or in digital

format, shall be bought (only a few of them are free). A given company making a tender for purchasing a system, a sub-system or a component might impose standards in the specifications of the tender, or it can produce its own requirements if they comply with the EU legislation.

Most of the standards developed by ESOs are submitted to the verification of the Harmonised Standard Consultants or HASC (who recently replaced the former New Approach Consultants or NAC). The HASCs verify the text of the standard against the relevant EU legislation and, if no inconsistencies or discordances are found, the document is declared “harmonised”. When such harmonised standard is published on the OJEU (Official Journal of European Union) a presumption of conformity applies; meaning that complying with such standard is one of the possible modes to comply with the relevant EU legislation. However, the use of such standard remains voluntary. Only when the standard is referenced in EU legal text, e.g. in TSIs, the use of it becomes mandatory.

Bringing the legal compliance of the CEN and CENELEC services, processes and deliverables closer to the era of the Digital Economy. CEN and CENELEC are about to adopt the common CEN-CENELEC Strategic Plan for the Digital Transformation Initiative. This Strategic Plan aims to address the needs of the industry and the stakeholders for high quality standards, which correspond to the increased use of digital solutions in a continuously changing Digital Economy. This initiative will significantly increase CEN and CENELEC System’s capacity to respond with agility and receptiveness through its own digital transformation. A fundamental element of the digital transformation of the CEN and CENELEC standardization deliverables and processes is to ensure that all new features that will be introduced therein are compliant with the current and expected regulatory requirements, and the proposed policy initiatives from the relevant European Union institutions. To support this initiative, CCMC has set up a targeted project aimed at mapping all the relevant legislations and policies at EU level which can affect the digital transformation of the CEN and CENELEC products, services and processes. Following the analysis of the relevant provisions identified, this project will develop a plan to address potential legal risks for CEN, CENELEC and their Members within digital transformation. Specifically, eight legal areas have been identified among the different EU legislative and policy initiatives as potentially posing challenges to the CEN and CENELEC Digital Transformation: Data protection, Cybersecurity; digital Copyrights, Patents; Trademarks, Competition aspects, Civil (and other) liability and Taxation aspects.

The Electronic Communications Committee (ECC) develops common policies and regulations in electronic communications for Europe and is a focal point for information on spectrum use. Its primary objective is to harmonise the efficient use of the radio spectrum, satellite orbits and numbering resources across Europe. It also prepares common proposals to represent European interests in the ITU and other international organisations.

The ECC itself is supported by Working Groups and Project Teams which carry out expert regulatory and technical studies and consultations to inform the ECC’s policy, and to create the deliverables which it approves.

Two of the ECC’s main outputs are “Decisions” and “Recommendations” on major harmonization issues. ECC Reports and CEPT Reports are studies which respectively inform ECC Decisions and Decisions of the European Commission; the latter are binding on EU Member States.

The ECC's approach is strategic, open and forward-looking, and based on consensus between the member countries. It works with all stakeholders, the European Commission, and ETSI to facilitate the delivery of technologies and services for the benefit of society.

#### Key EN IEC documents

EN IEC 61375 series defines the structure and technologies of an on-board Train Communication Network (TCN). In general, the standard series contains detailed considerations for the interworking of different network technologies on the level of the "Train Backbone" as well as of the "Consist Network". Applications of any type can communicate each other over the network irrespective of their position in the train and with no need to care about the communication protocols and mechanisms. For some of the technologies, EN 61375 contains procedures for conformance testing (EN 61375-2-2 and EN 61375-3-2). More conformance testing procedures can be developed in the future e.g. EN IEC 61375-2-8, currently under preparation, relevant to the conformance of the Ethernet technology.

The preparation of the 61375 series was assigned by the IEC TC9 to the working group WG43. In the view of the Dresden Agreement (now Frankfurt Agreement) IEC TC9, according to the IEC TC9-CENELEC TC9X Merging Strategy, proposed to CENELEC TC9X, which accepted, to submit the series to parallel voting. In order to support the coordination with IEC TC9 WG43, CENELEC TC9X set up, about 10 years ago, the mirror working group CLC TC9X WG15. An official liaison was set up between IEC TC9 WG43 and CLC TC9X WG15. This last WG was setting up a liaison with CEN TC278 in order to exchange information on the ongoing activity of standardisation in the ITS (Intelligent Transport System).

EN IEC 61375-2-3:2015 specifies rules for the data exchange between consists in trains. The aggregation of these rules defines the TCN communication profile. The objective of the communication profile is to ensure interoperability between consists of the said trains with respect to the exchange of information. The EN IEC 61375-2-3 proposes a logical train architecture which defines a train as composed of services and the information exchanged between the services and between user and services. A multimedia specific framework may be added which provides multimedia specific functions, protocols, and definitions, however the document does not define a multimedia specific framework.

IEC TS 61375-2-4:2017(E) applies to the applications in trains, i.e. it covers the application profile for functions belonging to the Train Control and Monitoring System (TCMS). The application profile is based on the TCN communication system for the data communication between consists of the said trains. This document provides for a data interface with parameters and addressing of TCMS functions based on the communication profile laid out in IEC 61375-2-3. This document is applicable in rolling stock requiring interoperable coupling and uncoupling. This part of IEC 61375 may be additionally applicable to closed trains and multiple unit trains when so agreed between purchaser and supplier. This Technical Specification was published in 2017 and was not submitted to the parallel vote in CENELEC. For the time being there is an official cooperation with UIC for improving the text extending the specification to all the functions of the TCMS. When the improved text will be ready it will be submitted to parallel vote in CENELEC and in case of approval it will become a European norm.



The EN IEC 61375-2-6 part of this standard series covers the specification of the communication between the on-board subsystems and the ground subsystems. The communication system, interfaces and protocols are specified as a Mobile Communication function, using any available wireless technology. This document does not cover the specification of the radio technologies and protocols relevant to the wireless communication between train and ground. The EN IEC 61375-2-6 addresses the security aspects relevant to train-ground communication.

The communication of safety related data between on-board applications and ground applications are out of the scope of this standard as well as Internet connectivity service for passengers.

The EN IEC 62580 standard series aims at defining requirements to ensure interoperability between on-board multimedia and telematics subsystems (OMTS). The general objective is to achieve compatibility between subsystems in the same vehicle and between subsystems on-board of different vehicles in the same train. The multimedia and telematic system includes passenger orientated services. The EN 62580 standard series originally envisaged to have a first part related to the general architecture and four parts addressing the four possible subsystem categories. However, only Part 1 – “General Architecture” has been published, while Part 2 – “Video surveillance/CCTV services” (related to Category A) is published by IEC as a Technical Specification. The other parts are at an earlier stage, with only Part 4 - Passenger orientated services (Category C) having already produced a draft working document.

EN IEC 62580-1 specifies the requirements relating to the boundary between the OMTS and the on-board communication system, as described by the IEC 61375 series. It also includes the methodology to describe an OMTS in terms of abstract model, and the general principles and the basic requirements to specify the services provided/needed by each category. This approach ensures interoperability between services. The standard includes high-level requirements to provide a common basis for the specification of the multimedia and telematic subsystems within each of the envisaged categories. Therefore, it includes a general architecture, as well methodology and guidelines to be followed in the preparation of the specific additional parts of the EN 62580 standard series. Communication aspects, although needed by the addressed subsystems, are not part of the scope, as they are dealt with by the EN 61375 standard series. The envisaged architecture follows a peer-to-peer Service Oriented Approach (SOA), which allows interoperability between applications at the level of Web Services. Messages are formatted according to XML (or optionally ASN.1). The possibility to follow a semantic approach based on a railway ontology is included as well. The general architecture, described by EN IEC 62580-1, is the basis of OMTS and is specified in terms of services. The main benefit of the service approach is to decouple applications from communication aspects, to assure that applications compliant with the IEC62580 series are compatible with the protocols compliant with IEC61375 series irrespective of possible amendments of the two series of standards.

EN 13149 is a CEN standard addressing Public transport - Road vehicle scheduling and control systems. TC 278 has developed it as part of its work on Intelligent Transport Systems. The Technical Specifications in the 13149 series provide rules for data communication systems on-board public transport vehicles. The standard is a pillar of the ITxPT Initiative, which is currently being set up by its Founding Members together with UITP, the International Association for Public Transport, following their agreement to further cooperate on the implementation of a working standard for plug-and-play IT-systems applied to public transport. An integrated test-bench offers services to specify,

test, qualify and showcase IT solutions. The ITxPT members are divided into three groups: strategic members, principal members and associated members.

The ITxPT Initiative Members will have access to the ITxPT platform to test their devices and applications in real operational conditions, supporting the uptake of this plug-and-play solution. By limiting the risks during the integration stage, these tests will facilitate the deployment process in operation.

The ITxPT Initiative Members cooperate with the purpose of:

- Support the ITS purchasers e.g. Public Transport Operators and Public Transport Authorities with the necessary specifications in order to achieve certified Plug and Play functionality when they purchase IT-systems for Public Transport use;
- Share experience and best practices of the plug-and-play standard for public transport;
- Support the evolution of the working standard towards its adoption within international common mechanisms, standard rules and protocols;
- Maintain in operating conditions the test bench and implementing new evolutions and implementations;
- Specify, test, qualify and showcase IT solutions on the test bench;
- Cooperate in dedicated Working Groups and contribute to the Initiative's Members knowledge and expertise;
- Coordinate the Initiative's Members submissions to the standardization process;
- Provide a common strategy and implement policy actions on ITxPT issues.

EN/TS 16406:2013 is a CEN Technical Specification that deals with Intelligent transport systems - Public transport - Indirect Fulfilment for Rail. This Technical Specification provides, in Clause 2, new and changed glossary items needed to define indirect fulfilment and its characteristics and to support the changes to the TAP-TSI and ERA Technical Document B5. Clause 3 defines the layout formats used for international rail services fulfilled using the ticket on departure and print-at-home ticket methods. The architecture shows only the link for the exchange of usage information between carrier, fulfilling equipment and checking equipment. For a more detailed description the standard refers only to the UIC leaflet 918-4.

UIC and IEC have a cooperation agreement which has the aim to coordinate the publications issued by IEC and UIC. In the frame of this agreement, a Strategic Liaison Group (SLG) was set-up, with meetings held on a 6-monthly basis between Officers of IEC/TC9 and UIC Standardisation Platform with the following tasks. The primary objective is to present and explain work programs of both IEC and UIC. Additionally, they identify the areas, the priorities and the standardisation work of mutual interest, keeping a cohesive system view, and propose a Program of Work of mutual interest to the Partners.

### Key UIC documents

The UIC 918 series covers information exchange relating to:

- *Reservation in trains (e.g. seats, couchettes);*
- *Availability information;*
- *Reservation on ferry;*
- *Timetable information;*
- *Tickets (travel documents);*
- *Listing.*

UIC Leaflet 918-1 describes the regulations and procedures to be observed when exchanging messages between a RU that issues travel tickets and reservation tickets and the electronic system of the RU which manages the necessary data for the issue of these tickets, in particular the inventories of seats available for reservation. It is supplemented by the following three very important leaflets:

UIC Leaflet 918-0 which deals with the general arrangements for electronic seat reservation and the electronic preparation of travel documents;

UIC Leaflet 918-2 which describes the standard RCT2 that applies to all the travel documents prepared electronically (the only people allowed access to this Leaflet are the correspondents whose names are on the list held by the UIC Passenger Department)

UIC Leaflet 918-4 which defines the necessary data in the messages relevant to electronic ticketing, in case of: (i) a ticket check (ticket is used or partially used), (ii) an endorsement/annotation (if the carrier was not able to fulfil a part of the contract), (iii) an after sales operation (when the ticket is cancelled/modified at a desk). Since some data can be optional, bilateral agreements should be made, defining which info of the list, defined in the standard as being optional, needs to be shared.

### Key data format and modelling documents

railML is a data exchange format developed by a consortium of railway companies, academic institutions and consultancy firms. Formed in 2002, the railML.org project aims to continuously develop this format in order to facilitate its use in a wide range of railway applications.

The project started as a partnership between the Fraunhofer Institute for Transportation Systems and infrastructure (FhG-IVI) and the Swiss Federal Institute of Technology's Institute for Transportation Planning and Systems (Nash, Huerlimann, Schütte, & Krauss, 2004), and is currently coordinated by a small independent team. railML.org conferences are held twice a year and supplemented by specialized working group meetings (railML.org, 2012). At time of writing the officially published version of railML is 2.2, with version 3 under development

Full Service Model (FSM) is a private industry initiative. It aims at facilitating online distribution services to the benefit of the travellers. FSM can contribute to offering door-to-door traveling solutions. In a first step, FSM focuses on rail, but it is compatible to all other modes.

Today, most railways and distribution service providers run proprietary IT-distribution systems. At the same time there is an increasing consumer demand for seamless travel and ticketing solutions. To meet this demand, companies are required to collaborate and offer overall ticket solutions.

Therefore, the initiative has developed an Open-IT-framework that can be integrated in already existing IT-distributions systems. Being implemented it can be used like an adapter and enables data exchange between different systems.

FSM specifies an online interface between rail distribution players to improve customer access to rail tickets. FSM defines how to communicate during all distribution processes

The FSM Initiative has defined an Application Programming Interface (API) that allows Distributors and Rail Service Providers (RSPs) to use common Sales and After-Sales interactions. RSPs may be rail carriers (e.g. Deutsche Bahn (DB) or RENFE (Spanish Railways)) or companies that are not carriers but provide information technologies (IT) services for carriers (e.g. SilverRail, Trainline and others distributing National Rail services in the UK on behalf of rail carriers etc.).

The FSM API is designed to work with the existing systems operated by Distributors and RSPs. The FSM API does not necessarily replace existing APIs that RSPs offer to Distributors, especially if the existing APIs have functions that are outside the scope of FSM. RSPs and Distributors could choose to use a 'hybrid' model, where the FSM API is used for some aspects of the distribution process and existing proprietary APIs are used for other aspects.

The primary target of FSM is transport services operated by RSPs, where the Rail Service Provider (RSP) generates offers according to current availability and demand. These RSP offers may be for any of:

- Travel on specific services only;
- Travel on specific services only, with mandatory place assignment (e.g. seat reservation);
- "Open" tickets (valid on any service that satisfies the fare conditions, typically including a specific route and sometimes specific service types, e.g. Inter-City services only).

The FSM API is designed for Business-to-Business (B2B) transactions, e.g. between a Distributor and an RSP.

CEN/EN 12896 – TRANSMODEL. Transmodel v5.1 concerns mainly the needs of urban bus, trolleybus, tramway and light rail, a lot of aspects of the metro. Whilst the Transmodel v6 extends the data model to consider heavy rail requirements.

CEN/EN 28701 – IFOPT is a European Standard, developed by CEN/TC 278 Intelligent transport systems, 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.),

in particular: to identify the relevant functions which need a unique identification of fixed objects especially for the Passenger Information domain in a multi-modal, multi-operator context.

CEN/TS 16614 Technical Specification deals with Public transport - Network and Timetable Exchange (NeTEx). NeTEx is dedicated to the exchange of scheduled data (network, timetable and fare information). It is based on Transmodel V5.1 (EN 12896), IFOPT (EN 28701) and SIRI (CEN/TS 15531-4, CEN/TS 15531-5 and EN 15531-1, EN 15531-2, EN 15531-3) and supports the exchange of information of relevance for passenger information about public transport services and also for running Automated Vehicle Monitoring Systems (AVMS).

NeTEx specification is divided into three parts. Part 1 describes the fixed Network (stops, routes, lines, etc.); Part 2 is mainly focused on Timetables and Part 3 covers Fare data.

The overall approach for the definition of fares within NeTEx Part 3 follows the approach used by Transmodel V5.1, namely the definition of access rights rather than of just products. This approach, used in Transmodel V5.1 (Fare Collection data model) to specify the access rights related to the urban public transport (for all urban modes) has been extended to cover access rights for long-distance rail.

NeTEx will facilitate interoperability between IT systems of involved PT parties by:

- Introducing common architectures for message exchange;
- Introducing a modular set of compatible services for real-time vehicle information;
- Using common data models and schemas for the messages exchanged for each service;
- Introducing a consistent approach to data management.

The Relation of NeTEx to GTFS is based on Google's General Transport Feed Specification (GTFS) [G1] which is a widely used format for distributing timetables to third parties. The NeTEx and GTFS formats should be considered as complementary, covering different stages in the data management process, and different workflows: NeTEx is "upstream", GTFS is "downstream". NeTEx differs from GTFS in that it has a much wider scope, and that it is intended for use in multi-sourced back office use cases under which data is generated, refined and integrated (requiring the exchange of additional elements used to construct the timetable), rather than just for provisioning journey planning systems (the prime purpose of GTFS).

CEN/15331 SIRI, The Technical Specification "Public transport – Service Interface for Real-time Information relating to public transport operation (CEN/TS 15531)" was first published in 2006 in 3 parts and became a CEN Technical Standard in 2007. Two further parts extended it in 2011. Since 2013, part 1 to 3 are published as draft European Standard (prEN 15531 rev) that are intended to supersede the CEN/TS 15531 documents of 2007. SIRI provides a framework for specifying communications and data exchange protocols in order to exchange real-time information related to public transport operations. SIRI is designed as a modular and expansible standard that uses XSD schemas.

For easy reference key relevant standards are grouped according to technical area and provided under Annex A.

## **5.4 SPECIFICATIONS PRODUCED BY OTHER INTERNATIONAL BODIES OR PLATFORMS.**

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Numerous companies are grouping together at international level in organisations or associations or platforms to produce their own specifications which are of voluntary applications.

Example of such bodies are:

- IATA in the aviation sector;
- OTA;
- CIT-OTIF in the international railway sector;
- OSPT Alliance;
- STA (Smart Ticketing Alliance) for public transport;
- CALYPSO which is international and based on CALYPSO platform;
- Global Platform UICC;
- Java card;
- W3C;
- IETF;
- NFC Forum;
- Platforms resulting from EC initiatives on urban mobility.

An example of the specifications produced by such bodies is the Full Service Model (FSM), produced by the mainline rail sector.

For easy reference, key relevant standards from these bodies have been added to the tables in Annex A, under relevant topics.

## **6. CONCLUSIONS**

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This report has provided an exhaustive list of all dissemination/communication activities carried out during the 36 months of project implementation. A large audience has been reached by IT2Rail messages and the project has at the same time ensured proper dissemination towards the Shift2Rail Joint Undertaking to ensure a smooth and effective transfer of results into the Shift2Rail projects.



## Annex A – Key list of Standards and Specifications

Card Physical Characteristics	
Standard /Specification	Title
ISO/IEC 7810:2003 Amd A2:2012	Identification cards – Physical characteristics + Amd A2:2012
ISO/IEC 7816-1	Integrated circuit cards with contacts – Card characteristics
ISO/IEC 11694-1:2012	Identification cards – Optical memory cards – Linear method – Part 1 Physical characteristics
ISO/IEC 11694-2:2012	Identification cards – Optical memory cards – Linear method – Part 2 dimensions and location of accessible optical area
ISO/IEC 11695-1:2015	Identification cards – Optical memory cards – Holographic recording method – Part 1: Physical characteristics
ISO/IEC 11695-2:2015	Identification cards – Optical memory cards – Holographic recording method – Part 2: Dimensions and location of accessible optical area
ISO/IEC 14443-1:2008	Identification cards — Contactless integrated circuit cards — Proximity cards — Part 1: Physical characteristics
ISO/IEC 14443-1:2008 +Amd A2:2012	Identification cards — Contactless integrated circuit cards — Proximity cards — Part 1: Physical characteristics +Amd A2:2012
Card Architecture and Commands	
Standard /Specification	Title
ISO/IEC 646:1991	Information technology – ISO 7-bit coded character set for information interchange
ISO/IEC 7811-1:2014	Identification cards – recording technique – Part 1: Embossing

ISO/IEC 7811-2:2014	Identification cards – Recording technique – Part 2: Magnetic Stripe-Low coercivity
ISO/IEC 7811-3:1995	Identification cards – Recording technique – Part 3: Location of embossed characters on ID-1 cards.
ISO/IEC 7811-4:1995	Identification cards- Recording technique- Part4: Location of read-only magnetic tracks – Tracks 1 and 2
ISO/IEC 7811-5:1995	Identification cards – Recording technique – Part 5: Location of read-write magnetic track – Track 3
ISO/IEC 7811-6:2014	Identification cards-Recording technique - Part 6: Magnetic stripe – High coercivity
ISO/IEC 7811-7:2004	Identification cards – Recording technique – Part 7: Magnetic stripe – High coercivity, high density
ISO/IEC 7811-8:2014	Identification cards – Recording technique – Part 8: Magnetic stripe – Coercivity of 51,7 kA/m (650 Oe)
ISO/IEC 7811-9:2015	Identification cards – Recording technique – Part 9: Tactile identifier mark
ISO/IEC 7812-1:2006	Identification cards – Identification of issuers – Part 1: Numbering system
ISO/IEC 7813:2006	Information technology – Identification cards – Financial transaction cards
ISO/IEC 7816	Integrated circuit cards with contacts – Card Operating System
ISO/IEC 7816-3	Information technology – Identification cards – Integrated circuit(s) cards with contacts –Part 3: Electronic signals and transmission protocols
ISO/IEC 7816-4:2005	Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange
ISO/IEC 7816-4:2013	Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange



ISO/IEC 7816-5	Identification cards – Integrated circuit(s) card with contacts – Part 5: Numbering system and registration procedure for application identifiers
ISO/IEC 7816-13	Identification cards – Integrated circuit cards – commands for application management in a multi-application environment
ISO/IEC 8825-1:2008	Information technology-ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)
ISO/IEC 10536-1:2000	Identification cards – Contactless integrated circuit(s) cards – Close-coupled cards – Part 1: Physical characteristics
ISO/IEC 10536-2:1995	Identification cards – Contactless integrated circuit(s) cards – Part 2: Dimensions and location of coupling areas
ISO/IEC 10536-3:1996	Identification cards – Contactless integrated circuits(s) cards – Part 3: Electronic signals and reset procedures
ISO/IEC 11693-1:2012	Identification cards – Optical memory cards – Part 1: General characteristics
ISO/IEC 11693-2:2009	Identification cards – Optical memory cards – Part 2: Co-existence of optical memory with other machine-readable technologies
ISO/IEC 11693-3:2015	Identification cards- Optical memory cards – Part 3: Authentication techniques
ISO/IEC 11694-3:	Identification cards – Optical memory cards – Linear method – Part 3 Optical properties and characteristics
ISO/IEC 11694-4	Identification cards – Optical memory cards – Linear method – Part 4 Logical Data structures
ISO/IEC 11694-5	Identification cards – Optical memory cards – Linear method – Part 5 Data format for information interchange for applications using ISO/IEC 11694-4

ISO/IEC 11695-3:2017	Identification cards – Optical memory cards – Holographic recording method – Part 3: Optical properties and characteristics
ISO/IEC 13239:2002	Information technology – Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures
ISO/IEC 14443-3	Identification cards — Contactless integrated circuit cards — Proximity cards — Part 3: Initialization and anticollision
ISO/IEC 14443-3:2011	Identification cards — Proximity cards — Part 3: Initialization and anticollision
ISO/IEC 14443-3:2011 / Amd.1:2011	Identification cards — Proximity cards — Part 3: Initialization and anticollision – AMENDMENT 1: Electromagnetic disturbance handling and single-size unique identifier
ISO 14813-6: 2009	Intelligent transport systems — Reference model architecture(s) for the ITS sector — Part 6: Data presentation in ANS.1
GlobalPlatform Card Specification 2.2.1	Card Specification 2.2.1
GlobalPlatform Card Specifications 2.2 – Amendment A	Confidential Card Content Management v1.0 – October 2007 JCP – Java Card Platform Specification 2.1
GlobalPlatform Card Specifications 2.2 – Amendment C	Card Specifications 2.2 – Amendment C: Contactless Services v1.0.1 – October 2007
JCP Java Card Platform Specification 2.1	Java Card Platform Specification 2.1

<b>Card Security</b>	
<b>Standard /Specification</b>	<b>Title</b>
ISO/IEC 7816-9	Identification cards – Integrated circuit(s) cards with contacts – Part 9: Additional interindustry commands and security attributes
ISO/IEC 7816-15:2004 +Amd A2:2008	Identification cards — Integrated circuit cards —Part 15: Cryptographic information application
ISO/IEC 9798-2: 2008	Information technology – Security techniques – Entity authentication – Part 2: Mechanisms using symmetric decipherment algorithms
ISO/IEC 9798-2:2008/Cor 3:2013	Information technology — Security techniques — Entity authentication — Part 2: Mechanisms using symmetric decipherment algorithms
ISO 15408: 2008	Information technology — Security techniques — Evaluation criteria for IT security (Common Criteria)
ISO/IEC 27005:2011	Information technology -Security techniques – information security risk management
<b>Card / Device Testing and Certification</b>	
<b>Standard /Specification</b>	<b>Title</b>
ISO/IEC 10373-6:2011	Identification cards — Test methods — Part 6: Proximity cards
ISO/IEC 10373-6:2011/ Amd.1:2011	Identification cards — Test methods— Part 6: Proximity cards — AMENDMENT 1: Additional PICC classes
ISO/IEC 10373-6:2011/ Amd.2:2012	Identification cards — Test methods — Part 6: Proximity cards — AMENDMENT 2: Test methods for electromagnetic disturbance
ISO/IEC 10373-6:2011/ Amd.3:2012	Identification cards — Test methods — Part 6: Proximity cards — AMENDMENT 3: Exchange of additional parameters, block numbering, unmatched AFI and TR2

NFC Forum	NFC Forum Authorized Test Lab Audit Manual v0.14
<b>RF (Proximity) Interface</b>	
<b>Standard /Specification</b>	<b>Title</b>
ISO/IEC 14443-1:2008	Identification cards — Proximity cards — Part 1: Physical characteristics
ISO/IEC 14443-1:2008/ Amd.1:2012	Identification cards — Proximity cards — Part 1: Physical characteristics AMENDMENT 1: Additional PICC classes
ISO/IEC 14443-2:2010	Identification cards — Contactless integrated circuit cards — Proximity cards — Part 2: Radio frequency power and signal interface
ISO/IEC 14443-2:2010 /Amd.1:2011	Identification cards — Proximity cards — Part 2: Radio frequency power and signal interface – AMENDMENT 1: Limits of electromagnetic disturbance levels parasitically generated by the PICC
ISO/IEC 14443-2:2010 / Amd.2:2012	Identification cards — Proximity cards — Part 2: Radio frequency power and signal interface – AMENDMENT 2: Additional PICC classes
ISO/IEC 14443-2:2010 / Amd.3:2012	Identification cards — Proximity cards — Part 2: Radio frequency power and signal interface – AMENDMENT 3: Bits rates of $f_c/8$ , $f_c/4$ and $f_c/2$
ISO/IEC 14443-4:2008	Identification cards — Contactless integrated circuit cards — Proximity cards — Part 4: Transmission protocol
ISO/IEC 14443-4:2008 /Amd.1:2012	Identification cards — Proximity cards — Part 4: Transmission protocol AMENDMENT 1: Exchange of additional parameters
ISO 14812: 1999	Transport Information and Control Systems (Glossary standard terminology for the transport information and control sector)
CEN TC278	[not yet published] Public transport — Interoperable fare management system — ISO/IEC 14443 Implementation specifications for IFM Systems

ISO 24014-1:2015	Public transport – Interoperable fare management system – Part 1: Architecture
ISO TR 24014-3:2013	[Working draft] – Public Transport – Interoperable Fare Management System – Part 3: Complementary concepts to Part 1 for multi-application media
ISO TS 14904:2002	Road transport and traffic telematics – Electronic fee collection (EFC) – Interface specification for clearing between operators.
EMV	Contactless Communication Protocol Specification for Payment Systems — Book D — EMV Contactless Communication Protocol Specification — Version 2.2 June 2012
<b>UICC / NFC Interface</b>	
<b>Standard /Specification</b>	<b>Title</b>
ETSI TS 102 225	Smart Cards; Secured packet structure for UICC based applications (Release 7) (2006-04)
ETSI TS 102 226	Smart Cards; Remote APDU structure for UICC based applications (Release 7) (2007-07)
ETSI TS 102 613	UICC CLF interface – Part 1 Physical and data link layer characteristics (Release 7 2007-11)
ETSI TS 102 622	Smart Cards; UICC – Contactless Front-end (CLF) interface; Host Controller Interface (HCI) (Release 7 2008-02)
ISO/IEC 18092	Near Field Communication – Interface and protocol
GlobalPlatform UICC Configuration 1.0 – October 2008	UICC Configuration 1.0 – October 2008
GlobalPlatform	Messaging Specification 1.0 – October 2003
GSMA	MNO-SP Interface: Business Process Implementation Guidelines using GP Protocols

GSMA	NFC Service Provider Applet Development Guidelines
GSMA	NFC UICC Requirement Specification, Version 3.01, (Oct12)
GSMA	NFC Handset APIs & Requirements v3.01 (Oct12)
GSMA	NFC Core Wallet Requirements and Core Package File Technical Proposal V1.0 (Oct12)
GSMA	Multi Protocols for Interoperability (Nov12)
NFC Forum	NFC Logical Link Control Protocol (LLCP) Technical Specification v1.1
NFC Forum	NFC Activity Technical Specification v1
NFC Forum	NFC Simple NDEF Exchange Protocol specification v1
NFC Forum	NFC Analog Technical Specification v1
NFC Forum	NFC Controller Interface (NCI) Technical Specification v1
NFC Forum	NFC Data Exchange Format (NDEF) Technical Specification v1
NFC Forum	NFC Forum Connection Handover v1.2
IETF	Internationalized Resource Identifiers (IRIs) RFC3987 <a href="http://www.ietf.org/rfc/rfc3987">http://www.ietf.org/rfc/rfc3987</a>
WC3	Widget Packaging and XML Configuration, <a href="http://www.w3.org/TR/widgets/">http://www.w3.org/TR/widgets/</a>
RFC1032	Domain Administrators Guide, IETF RFC1032 <a href="http://www.ietf.org/rfc/rfc1032">http://www.ietf.org/rfc/rfc1032</a>

### Transport Use Cases

Standard /Specification	Title
ISO 24014-1:2007	Public transport – Interoperable fare management system – Part 1: Architecture (IFMS)
ISO 24014-2	[Working draft] – Public Transport – Interoperable Fare Management System – Part 2: Recommended Business Practice for Set of Rules

ISO TR 24014-3:2013	[Working draft] – Public Transport – Interoperable Fare Management System – Part 3: Complementary concepts to Part 1 for multi-application media
<b>Transport Data</b>	
Standard /Specification	Title
EN1545-1:2005	Identification Card Systems – Surface Transport Applications – Part 1: Elementary Data Types, General Codelists and General Data Elements
EN1545-2:2005	Identification Card Systems – Surface Transport Applications – Part 2: Transport and Travel Payment Related Data Elements and Codelists
ISO 14813-6: 2009	Intelligent transport systems — Reference model architecture(s) for the ITS sector — Part 6: Data presentation in ANS.1
ISO 14817:2002	Transport information and control systems — Requirements for an ITS/TICS central Data Registry and ITS/TICS Data Dictionaries
ISO TS 14904:2002	Road transport and traffic telematics – Electronic fee collection (EFC) – Interface specification for clearing between operators
EN-15320	Identification card systems – Surface transport applications – Interoperable Public Transport Applications – Framework
EN 28701:2012	Identification of fixed PT Objectives
<b>User Interface</b>	
Standard /Specification	Title
EN 1332-1	Identification Card Systems – Man-Machine Interface – Part 1: General design principles for the user interface
EN 1332-3	Identification Card Systems – Man-Machine Interface – Part 3: Key pads

EN 1332-4	Identification Card Systems – Man-Machine Interface – Part 4: Coding of user requirements for people with special needs
<b>Semantic Interoperability</b>	
<b>Standard /Specification</b>	<b>Title</b>
ISO 16642	(family of metamodels)
ISO 12200	Data model's business
ISO 12620	Domain data dictionaries
ISO 20022 (8 parts)	Financial services – Universal financial industry message scheme – Part1: Metamodel
ISO TS 17369:2013	Statistical data and metadata exchange (SDMX)
ISO 11179-1:2015	Framework
ISO/IEC 11179-2:2005	Classification
ISO 11179-3:2013	Registry metamodel and basic attributes
ISO/IEC 11179-4:2004	Formulation of data definitions
ISO/IEC 11179-5:2015	Naming and identification principles
ISO 11179-6:2005	Metadata registries, part 6: Registration
ISO/IEC 14957	Information technology – Notation of format for data elements
ISO 19135:2005	Geographic information – Procedures for item registrations
ISO/TS 19150-1:2012	Geographic information – Ontology – Part 1
ISO/IEC 19763-5:2015	Information technology – Framework for Metamodel interoperability



ISO/IEC 19773	Information technology – Metadata modules (MM)
ISO/IEC 20943	Information technology – Procedures for achieving metadata registry content consistency
ISO/IEC 20944	Information technology – Metadata registry interoperability and bindings (MDRIB)
ISO/IEC 2016-1:2014	Information technology for learning
ISO/IEC JTC 1:2015 PDF report.	<p>studies/ use cases and scenarios for Big Data from JTC 1, ISO, IEC and other .....</p> <p>Variability refers to changes in data rate, format/structure, semantics, and/or</p> <p>quality ... and tiers can lose provenance and metadata information and open the</p> <p>..... standards for interoperable "geo-enable" solutions on the Web, ...</p>

## **Annex B – UK specifications for railway IT services**

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### Introduction

BSI, the British Standards Institution, is in charge of developing standards and is the British mirror committee which interfaces CEN/CENELEC, IEC and ISO. Furthermore, in U.K, the standardisation is addressed by RSSB, the Rail Safety and Standards Board. However, the Rail Settlement Plan (RSP) is very active in the specification of railway IT services. RSP is a company owned by the franchised passenger rail operators. It provides a range of common, largely IT based services to those operators including open access operators and third-party providers of information and retail services.

The company was established on the privatisation of British Railways to enable the new rail operators to continue to provide a network wide retail service - something that passengers were familiar with prior to privatisation. Since then, the company has increased the range of services it provides to rail operators and others. The company now:

- Collects retail sales data from 8,500 ticket issuing systems;
- Carries out the correct allocation of ticket revenue to rail operators;
- Settles that revenue to the rail operators;
- Sets standards for and accredits all industry ticket issuing systems;
- Maintains the central industry fares database and provides tools for rail operators to set fares;
- Distributes fares, timetable, station and other industry data to ticket issuing and information systems;
- Provides the National Reservations Service enabling retailers to book reservations on all trains with reservable seats;
- Provides the capability to pick up pre-ordered tickets at self-service ticket machines (Ticket on Departure);
- Provides the industry standard ticket stock.

### **RSPA2000 TIS Accreditation Guide**

This Ticket Issuing System (TIS) Accreditation Guide is intended as a first point of call for information concerning any aspect of accreditation. It provides background and contextual information and directs the reader to more detailed documents concerning accreditation.

### **RSPA2001 TIS Process Guide - General & Back Office**

This TIS Process Guide provides all the non-functional requirements placed on TIS through accreditation. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Accreditation Guide for further background.

**RSPA2002 TIS Process Guide - Select a Product**

This TIS Process Guide covers the Select Product process, which is that part of the TIS process from the start to the point at which one or more products can be selected for process (e.g., from select a journey, through pricing, reservation, to method of fulfilment). TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Accreditation Guide for further background.

**RSPA2003 TIS Process Guide - Make a Sale**

This TIS Process Guide covers the Make a Sale process, including settlement recording, and payment. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Supplier Guide for further background.

**RSPA2004 TIS Process Guide - Direct Fulfilment**

This TIS Process Guide covers Direct Fulfilment, which is where the TIS interacts directly with the ticket media without a logically or physically independent Fulfilment Service. There are three direct fulfilment media: printed tickets, smartcards and self-print. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Accreditation Guide for further background.

**RSPA2005 TIS Process Guide - Indirect Fulfilment**

This Process Guide covers the Indirect Fulfilment methods of Ticket on Departure (ToD) and ITSO Actionlist Item. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Accreditation Guide for further background.

**RSPA2006 TIS Process Guide - AfterSale Events**

This TIS Process Guide covers the After (Post) Sale Events, for example (a) ITSO After Sale (e.g., refunds and exchanges), (b) Non Season Tickets duplicates, (c)

CCST refunds (CCST to be voided), (d) Barcoded refunds and changes, (e) CCST automated refunds and (f) Refunds to same payment card etc. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Supplier Guide for further background.

**RSPA2007 TIS Process Guide - UsageBased Products**

This TIS Process Guide covers smartcard usage-based products. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Supplier Guide for further background.

**RSPA2008 TIS Process Guide - ITSO in National Rail**

This TIS Process Guide provides information on what is required to implement ITSO on National Rail. [Also see RSPS3016: Accreditation Requirements - ITSO Validation]. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See

**RSPA2009 TIS Process Guide - TIS Accreditation to SmartCard schemes**

This TIS Process Guide will provide information for TIS Accreditation to SmartCard schemes.

**RSPA2010 TIS Process Guide - TIS Supplier APIs**

TIS Process Guide document that outlines the process for TIS Suppliers to accredit third party usage of API software. TIS Process Guides are intended to provide context and design guidance to those involved in TIS design and accreditation. See RSPA2000 TIS Supplier Guide for further background.

**RSPS1002 Ticket on Departure Code of Practice**

The Code of Practice (CoP) seeks to provide guidance to all participants in TOD business protocols. RSPS1003 ITSO Code of Practice Code of Practice for ITSO Standards

**RSPS1020 National Rail Journey Planning Systems - Approved Code of Practice**

Outline of the Code of practice for National Rail Journey Planning Systems.

**RSPS1021 RSP Compliancy Policy - Fulfilment and Validation**

Defines policy on fulfilment and validation of future ticketing media. Supersedes the previous policy document titled "Policy Position on Deferred Printing".

**RSPS1022 NRS Usage Policies for Journey Information and Ticket Issuing Systems**

This document sets out RSP policies regarding connection to and use of the National Reservations Service (NRS) by Journey Information and Ticket Issuing Systems. It details specific obligations and limitations relating to the use of NRS in order to protect the service from excess/ inefficient demand and also to protect TOC commercial interests. Any party providing rail Ticket Issuing Systems (TIS) (including vending machines) or Journey Information Systems (JIS) (e.g. on-line journey planning systems) that access NRS must comply with the policies specified within this document. Appendix A - Questionnaire is also included as a downloadable editable version for use when completing the questions for responding to RSP. RSPS2xxx Retail Doc reference Document title Description

**RSPS2000 RSP Barcodes in Rail Retailing**

This document defines a set of barcode standards that apply to documents or products available for use by all TOCs. By setting standards, inter-operability and re-use will be maximised, and implementation and running costs minimised.

**RSPS2001 Retail Control Service - Interface Control Document**

This Interface Control Document is published by Rail Settlement Plan Ltd (RSP) to specify the Standard Open Published Interface (SOPI) between RSPs Retail Control Service (RCS) and approved Ticket Issuing Systems (TIS) or Journey Information Systems (JIS). It defines the data structure, the data delivery mechanisms and approach and a description of how the data must be used. For example, it will define how retail control data for ITSO smartcard locations and products is distributed to TIS and JIS, and how they apply this data to apply retail control rules for information provision and ticketing.

**RSPS2002 CCST Layout Design - Preprinted Formats**

This document defines the layout to be used by Ticket Issuing Systems (TIS) when operating with pre-printed CCST stock in respect of RSP settled products. It covers these national rail products: 16-25 Railcards, Family & Friends Railcards, Network Railcards, Senior Railcards, Gold Card Season Tickets and Travelcards, and Gold Record Cards.

**RSPS3xxx Fulfilment**

Doc reference Document title Description RSPS3000 RSP Ticketing Specification Magnetic Stripe Encoding This document gives details of the specification for the magnetic stripe encoding on credit card sized tickets (CCST).

**RSPS3001 Barcode Presentation and Data Specification**

This document is the RSP standard that defines the technical aspects of encoding rail ticketing information within a barcode (e.g., the barcode data content and security requirements). RSPS3002 ITSO in National Rail - This document specifies the National Rail standards for issuing, checking and

Specification validating rail products on ITSO Smart Media. It specifies in detail how rail products should be mapped to the ITSO Product Entities (IPEs) and also defines the rail specific rules that are required around the ITSO specification to ensure interoperability across the rail network.

**RSPS3003 CCST Layout Design**

This document defines the approved ticket and associated print item formats to be used by Ticket Issuing Systems (TIS) when operating with the standardised "Common" CCST stock.

**RSPS3004 Accreditation Requirements - Ticket on Departure**

This document defines the business processes that comprise ToD indirect fulfilment, plus the input and output conditions associated with each process, that will be used in accreditation. The document gives the precision needed to avoid settlement and other system errors.

**RSPS3005 TIS Accreditation Requirements - Direct Smartcard**

The purpose of this document is to present the standards and accreditation requirements for direct fulfilment via ITSO Smartcard

**RSPS3006 Accreditation Requirements - ITSO Actionlist Fulfilment**

The purpose of this document is to present the standards and accreditation requirements for indirect fulfilment via ITSO Smartcard.

**RSPS3008 RSP Ticketing Specification - Self Print Ticket Specification**

Ticketing specification for A4 Self Print tickets for use when passengers print out their own tickets at home or in the office.

**RSPS3009 RSP Ticketing Specification - ATB Ticketing Layout**

Ticketing specification for ATB tickets (this ticket format is gradually being superseded by other ticket formats and other ticketing media).

**RSPS3010 RSP Ticketing Specification - A4 Printing Ticket Layout Formerly called \*A4 Travelpack Ticket Specification\***

**RSPS3011 RSP Ticketing Specification - CCST Stock Specifications**

Ticketing specification for Credit Card Sized Tickets (CCST) using standardised RSP ticket stock. These comprise the physical CCST specification and the print layout specification (1/2).

**RSPS3012 TIS Accreditation Requirements - Direct Fulfilment CCST and Self Print**

This document defines the business processes that comprise Print direct fulfilment, plus the input and output conditions associated with each process that will be used in accreditation. The document will give the precision needed to avoid settlement and other system errors.

**RSPS3013 MobileTelephone Ticketing Layout Specification**

This document is issued by RSP to define the approved mobile telephone ticket layout to be used by Ticket Issuing Systems (TIS).

**RSPS3014 Accreditation Requirements**

This document is Indirect Mobile Fulfilment Accreditation Requirements - Indirect Mobile Fulfilment RSPS3015 ITSO Usage-based Product Accreditation Requirements Accreditation Requirements - ITSO user-based products

**RSPS3016 TIS Accreditation Requirements- ITSO Ticket Control Equipment**

The purpose of this document is to present the accreditation requirements for ITSO ticket control equipment.

**RSPS3017 TIS Product Record Specification - (Permanently on Hold)**

TIS Product Record Specification

**RSPS4000 SDCI+ Interface Specification - Lennon Settlement**

This document defines the interface specification to the LENNON service. It includes the changes specified under the Automated Settlement Programme that only need to be adopted if automating the capture of warrants and refund data. RSPS4001 SDCI+ Push Process Protocols Protocols for pushing files to Lennon by RSP-accredited TIS. RSPS5xxx Distribution Doc reference Document title Description

**RSPS5000 RJIS Datafeeds Interface Specification - Fares and Associated Data**

This document describes in detail the data feed for Fares data extracted from the RJIS Data Factory. It is based on the generic specification which defines the basic rules and procedures that will apply to the data feeds.

**RSPS5001 RJIS Datafeeds Interface Specification - For Timetable Information**

This document describes in detail the data feed for Timetable Data extracted from the RJIS Data Factory. It is based on the generic specification which defines the basic rules and procedures that will apply to the data feeds.



**RSPS5002 National Routing Guide Datafeed Specification**

This document describes in detail the data feed for Routeing Guide Data extracted from the RJIS Data Factory. It is based on the generic specification which defines the basic rules and procedures that will apply to the data feeds.

**RSPS5003 RSP Additional Datafeed Interface Specification**

This document describes in detail the data that cannot be represented in the current data structures. This currently includes PlusBus and traintaxi information. It is based on the generic specification which defines the basic rules and procedures that will apply to the data feeds.

**RSPS5004 Network Rail Common Interface File - End User Specification**

The timetable data supplied as part of the RSP timetable data feed is sourced from Network Rails Train Services Database (TSDB) in Common Interface Format (CIF) and is filtered to exclude non-passenger train services. This document provides details of the structure and content of the data in CIF.

**RSPS5005 NRS Reference Data Store (RDS) Standard Open Published Interface (SOPI) Control Document**

The Reference Data Store (RDS) Standard Open Published Interface (SOPI) Control Document is provided to TIS suppliers as part of the feed to users of the NRS Retail SOPI.

**RSPS5006 Retail SOPI Interface Control Document**

This is the current version of the Retail SOPI Interface Control Document for the National Reservations Service (NRS). It defines the XML messages that can be used to communicate with NRS for the purposes of availability enquiries, booking reservations and making APRS bookings.

**RSPS5008 ATOC New Reservations System UC49 Enquire on Service Details**

Service Details Request - Service Details Response

**RSPS5009 ATOC New Reservations System UC63 Enquire on Coach Layout**

Display Layout Request - Display Layout Response

**RSPS5010 ATOC New Reservations System UC93 Enquire on Product Availability**

Product Availability Request - Product Availability Response

**RSPS5011 ATOC New Reservations System UC101 Do Availability Enquiry**

Availability Request - Unrestricted Availability Request - Availability Response - Together Availability Request - Unrestricted Together Availability Request - Together Availability Response

**RSPS5012 ATOC New Reservations System UC104 Do Reservation Request**

Booking Request - Group Booking Request - Booking Response

**RSPS5013 ATOC New Reservations System UC105 Do Coach Availability**

Coach Availability Request - Coach Availability Response

**RSPS5014 ATOC New Reservations System UC106 Do Recall Booking**

Recall Booked Unit Request - Recall Booking Request - Booking Response

**RSPS5015 ATOC New Reservations System UC107 Do Cancel Booking**

Cancel Booking Request - Cancel Group Booking Request - Cancel Booking Response

**RSPS5016 ATOC New Reservations System UC108 Do Maintain Existing Reservation**

Amend Booking Request - Amend Group Booking Request - Booking Response

**RSPS5017 ATOC New Reservations System UC114 Do Disabled Passenger Train Report**

DPTR Request - Subject to Labelling & Reporting ICD Contents - DPTR Response - Subject to Labelling & Reporting ICD Contents

**RSPS5018 ATOC New Reservations System UC116 Request Disabled Passengers Listed by Date & Location (DLP) Report Specification**

DLP Request - Subject to Labelling & Reporting ICD Contents - DLP Response - Subject to Labelling & Reporting ICD Contents

**RSPS5019 ATOC New Reservations System UC117 Do Season Ticket Reservation Request**

Season Booking Request - Booking Response

**RSPS5020 ATOC New Reservations System UC118 Do Passenger Assistance Request**

Assistance Request - Assistance Response

**RSPS5021 ATOC New Reservations System UC119 Do Recall Existing Passenger Assistance Request**

Recall Assistance Request

**RSPS5022 ATOC New Reservations System UC120 Do Cancel Existing Passenger Assistance Request**

Cancel Assistance Request - Cancel Assistance Response

**RSPS5023 ATOC New Reservations System UC121 Do Maintain Existing Passenger Assistance Request**

Modify Assistance Request

**RSPS5024 ATOC New Reservations System UC122 Do Recall Stations Information Database Data**

Station Accessibility Request - Station Accessibility Response

**RSPS5025 ATOC New Reservations System UC124 Do List Assistance Requests Specification**

List Assistance Request - List Assistance Response

**RSPS5026 ATOC New Reservations List Coach Request - List Coach Response System  
UC176 Do List Coach**

**RSPS5027 RJIS Standard Online Interface Specification - Part 01 Overview**

The RJIS Standard Online Interface Specification describes how the RJIS Data Factory can be accessed via the Journey Query Interface (JQI). This specification and RSPS5028 to RSPS5038 will be replaced as part of the RJIS Extension Project in 2009.

**RSPS5030 RJIS Standard Online Interface Specification - Part 08 - Version 2 - Station Information**

see RSPS5027

**RSPS5031 RJIS Standard Online Interface Specification - Part 09 - Version 2 - Bulletin Calls**

see RSPS5027

**RSPS5032 RJIS Standard Online Interface Specification - Part 12 - Version 2 - Customer Transaction Records**

This document details the Version 2 JQI Customer Transaction Records Interface calls.

**RSPS5034 RJIS Standard Online Interface Specification - Part 14 - Version 3 - JQI Standard Elements**

see RSPS5027

**RSPS5035 RJIS Standard Online Interface Specification - Part 15 - Version 3 - Journey Planning Calls**

see RSPS5027

**RSPS5036 RJIS Standard Online Interface Specification - Part 18 - Version 3 - New Reservations System Interface**

see RSPS5027

**RSPS5037 RJIS Standard Online Interface Specification - Part 19 - Version 3 - Retrieve Journeys with Available Places**

see RSPS5027

**RSPS5038 RJIS Standard Online Interface Specification - Part 21 - Version 3 - TIS Calls**

see RSPS5027

**RSPS5040 Ticket on Departure Functional Specification RJIS - CTR Open Standard Functional Specification**

**RSPS5041 TTIS Timetable Data Interface Specification TTIS Timetable Data Interface Definition RSPS5042 Lennon Reference Data Interface Specification**

This document consolidates information on Lennon reference data files. RSPS6xxx General Reference Doc reference Document title Description RSPS6001 Classifications Schemes and

Glossary This document comprises Classification Schemes, Glossary of Terms and Abbreviated Terms.

### **RSPS7000 TIS Accreditation Requirements - General & Back Office**

The purpose of this document is to describe all the non-functional requirements placed on TIS through accreditation

### **RSPS7001 TIS Accreditation Requirements - Select a Product**

The purpose of this document is to present the accreditation requirements for the select product process (journey, price, reservation, and method of fulfilment).

### **RSPS7002 TIS Accreditation Requirements - Make a Sale**

The purpose of this document is to present the accreditation requirements for the processes related to the sale of a product (including settlement recording, payment and hold a reservation).

### **RSPS7003 TIS Accreditation Requirements - After-Sale Events**

The purpose of this document is to present the accreditation requirements for the processes related to after-sale (post-sale) events which are characterised by their relationship to a previous sale transaction. This covers: Excess Fares, Refunds, Season Ticket Replacement, Duplicates, Changeovers, ITSO After (Post) Sale (e.g., refunds and exchanges), Non Season Tickets duplicates, CCST refunds (CCST to be voided), barcoded refunds and changes, CCST automated refunds and refunds to same payment card.

### **RSPS7004 TIS Accreditation Requirements - TIS Supplier APIs**

The purpose of this document is to provide a starting point for the TIS suppliers User Interface (UI) testing scripts required as part of the API accreditation process documented in standard RSPA2010, TIS Process Guide - TIS Supplier APIs

### **RSPS9000 RSP Compliance Standards Development Process**

This document describes how the standards needed by RSP services and for RSP accreditation are developed and maintained. It covers the standards development and update process, governance, document naming, and internal RSP monitoring and management process.

### **RSPS9001 RSP Compliance Standards Document Register**

This external document provides an index of the documentation in the Compliance Standards area of the Rail Delivery Group (RDG) web site ([www.raildeliverygroup.com](http://www.raildeliverygroup.com)).

### **RSPS9004 RSP Compliance Standards Document Review Form**

This spreadsheet should be used for giving feedback on the documents for review. A copy should be made for each document being reviewed and where comments have been made. All completed spreadsheets should be sent to [rspretailstandards@atoc.org](mailto:rspretailstandards@atoc.org).

**RSPS9009 TIS Accreditation Application Form Application form for TIS and other equipment suppliers**

RSPS9010 Pilot, Upgrade & New Installation Proforma Application form for pilot, upgrades and new installations.

**RSPS9011 Minor Release Request Form Application form for Emergency Bug Fixes and Minor Releases**

RSPS9012

**User Guide for Automated Lennon Test Service (ALTS)**

The purpose of this document is to provide guidance and instruction to TIS Suppliers on how to make use of the Automated Lennon Test System

**RSPS9013 ITSO Certification of Rail POST Equipment**

External standard – Defines the minimum certification requirements for ITSO UK rail validation equipment. Please see the following external website <http://www.itso.org.uk> for the latest ITSO Standards document version.

**RSPS9014**

ITSO Smartcard Specification EN1545 - Identification Card Systems.

Defines the structure of ITSO data elements, i.e. ITSO "TIME" data element. Please see the following external website <http://www.itso.org.uk> for the latest ITSO Standards document version.