EUROPEAN
UNION
AGENCY
FOR RAILWAYS

Making the railway system
work better for society.

FINAL REPORT ERA-REC-122
TO THE RECOMMENDATION OF
THE EUROPEAN UNION AGENCY FOR RAILWAYS

on

Revision of the regulation 454/2011/EC concerning the technical specification for interoperability relating to the telematics applications for passengers

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Contents

1. Executive summary

The report is the final report for the recommendation ERA-REC-122 concerning the revision of the TSI "Telematics applications for passengers". The report explains the achieved results of the working party.

The mandate for the revision of the TAP TSI has been given by the regulation (EU) 454/2011 itself, where the Agency has been requested to close the open points of the TAP TSI until 2012. ERA has submitted on 30.3.2012 a report about the closing of the open points [1]. The main statement in this report was: "*Until today no open point can be closed finally. The major reason is the short timeframe after the adoption of the TAP TSI. This timeframe was not sufficient to close all of the open points. The second reason is that the work for closing of three open points was given to the European standardisation organisation CEN. There was a slight delay in the work of these CEN working parties.*" Therefore ERA proposed to postpone the closing of the open points until those standards were available.

The European commission published on 8 June 2017 the supplementing Directive (EU) 2016/797 with specific objectives for the drafting, adoption and review of technical specifications for interoperability. The document defined in detail the tasks to be elaborated by ERA concerning the revision of the TAP TSI and mandated ERA for this revision.

The working party started the discussion about the revision of the TAP TSI with the kick-off meeting on 4. April 2017. The main topics for the discussion were:

- further development of the underpinning technical documents in the TAP TSI phase one and two
- closing of the open points.
- Incorporation of the developments of the TAP TSI technical documents, which were further developed in the ERA TAP TSI CCM working party and by the rail sector in the phase one and two of the TAP TSI implementation
- The alignment of the TAP TSI with the current version of the telematics applications for freight (TAF TSI)
- The incorporation of the requirements from Directive (EU) 2016/797
- The Revision of chapter 4 of the TAP TSI (RU/IM basic parameters)
- The Revision of chapter 4 of the TAP TSI (retail basic parameters)
    - o 4.2.2.1   Technical document on the process and the information used for it in respect of tariff data intended for domestic sales
    - o 4.2.10.   Standard for the handling of security elements for product distribution
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    - o 4.2.11.3 Technical document or standard on direct fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales
    - o 4.2.11.4 Technical document or standard on indirect fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales
    - o 4.2.22.   Management of connection with other modes of transport, the standards for the data exchange for timetable and international fare data

The working party has finished discussion in 11 December 2019 and provided a recommendation about the revision of the TAP TSI. The recommendation has been submitted to the European Commission and has been published in parallel on the website of the Agency.

The working party could not complete the work for the technical details for the basic parameters concerning ticketing, data exchange for PRM and tariff data exchange. This affects solely the application guides for the TAP TSI. The working party "Revision of the TAP TSI" has therefore to be continued to discuss further the following topics:

- Update or drafting of the application guides for the TAP TSI technical documents
- Elaborating a solution for the closing of the open point "Standard for European exchange of ticket control and ticket status modification data"

The working party will be continue their work in 2020, mainly focusing on the revision of the application guides for the TAP TSI. The closure of the open point "Standard for European exchange of ticket control and ticket status modification data" is foreseen as soon a standard for the ticket control data exchange is available.

2.   Introduction

The report shows the results achieved after about more than 2 years of work on the revision of the commission regulation (EU) 454/2011 Telematics Applications for Passengers TAP TSI. It gives background information about the revised draft TSI, which is attached as an annex to this report.

The working party had 10 meetings and could agree on a final proposal for recommendation of the revised TAP TSI, closing the six open points and solving the questions addressed by the delegated decision (EU) 2017/1474.

2.1.   Legal basis

The legal basis for the revision of the TAP TSI is based on the following documents:

-     Regulation (EC) No (EU) 2016/796 repealing Agency Regulation (EC) No 881/2004
-     Commission Regulation (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system.
-     COMMISSION DELEGATED DECISION (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability, Article 14

The commission regulation (EU) 454/2011 specifies in article 3 the requirement for ERA to close the open points of the TAP TSI in ANNEX II - LIST OF OPEN POINTS until 2012. ERA has submitted in 2012 a report about the closing of the open points, stating, that the standards needed for the closing are under development but still not available [1].

The delegated decision (EU) 2017/1474 defined in detail the closure of the following topics during the revision of the TAP TSI:

-     The geographical scope of the TAP TSI shall be the geographical scope of the TAF TSI.
-     Where appropriate, the TAP TSI shall take into account the essential requirement 'Accessibility' as defined in Annex III, point 1.6 of Directive (EU) 2016/797.
-     The TAP TSI shall take into account the revision of the TSI PRM, in particular as regards the Inventories of Assets and, where appropriate, the industry-driven Full Service Model initiative.
-     The TAP TSI shall define the share of the tasks related to the management of centralised data structures to take into account the new tasks and responsibilities of the Agency and the governance body established by the sector with a view to accelerate the TAP TSI implementation.
-     The TAP TSI shall aim to facilitate the emergence of through-ticketing, integrated ticketing and multi-modal travel information and reservation systems.

For the purpose of defining the Agency's vision related to the telematics applications for passengers, based on a thorough analysis of the existing situation and the of the customers' needs, a Strategy for TAP was developed at the level of the Agency, including a plan of actions. The current project for the revision of the TAP TSI covers part of the actions identified in these documents.

Several points of the revision of the TAP TSI are related to the rail passenger rights regulation. This is specifically the case for the project objective:

-     4.2.16/ 4.2.15 Facilitate the processing of passengers' complaints according to the passenger rights regulation 1371/2007 for the RU'S by storage of the TrainRunningMessages for 12 months.

The European Passenger rights regulation (EU) 1371/2007 is undergoing a revision. Today the revision is subject of a formal trilogue meetings between the Council of the European Union, the European Parliament

and the European Commission, a final compromise could not yet achieved[1]. Therefore the timeframe for the storage of those messages is defined according to the assumption, that 12 months are acceptable.

2.2.   Purpose and Scope

The TAP TSI has been drafted between 2007 and 2010. It has been published as Commission regulation (EU) 454/2011 on 12 May 2011. Due to the developments in the rail sector, especially concerning the railway distribution, the content of some parts of the regulation has to be revised. This is mainly driven by the following facts:

- The further development of the underpinning technical documents – especially the technical documents B.61 (Master plan) and B.62 (Governance) - in the TAP TSI phase one and two
- The availability of harmonized standards to close the open points. The current TAP TSI contains in Annex II six open points. These points are covering basic parameters, which could not be finally evaluated during the drafting of the TAP TSI. According to article 3 of the TAP TSI, ERA had to submit a recommendation about them by March 2012. In 2012 neither the needed harmonized standards nor ERA technical documents were available to close these open points. Therefore ERA has submitted in March 2012 a progress report about the closure of the open points and has outlined their status and their inter-dependencies. Some of those standards, namely for fare data exchange and for the indirect fulfilment, which were not available during the drafting phase of the TAP TSI, are now ready to be integrated into the TAP TSI. Other standards e.g. for the direct fulfilment are still not available.
- The technical documents of the TAP TSI were further developed in the ERA TAP TSI CCM working party and by the rail sector in the phase one and two of the TAP TSI implementation. Most of the changes of the TAP TSI technical documents are purely technical and were already incorporated. However, some of these changes remained unsolved, because they will affect the TAP TSI basic parameter definition as well and they cannot be modified in the TAP TSI CCM working party. The current text of the TAP TSI does not reflect these changes.
- The alignment of the TAP TSI with the current version of the TAF TSI. The TAF TSI was revised in 2013. Changes of the common basic parameters for the RU/IM-communication have to be reflected in the TAP TSI as well.

The scope of the revision of the TAP TSI includes four main topics:

1. Revision of the chapter 4 to incorporate important change requests of the TAP TSI CCM and the TAP TSI implementation phases 1 and 2 with an impact on the definition of the TAP TSI basic parameters.
2. Revision of the chapter 4 to make it consistent with the revision of the chapter 4 of the TAF TSI
3. Closure of the open points of the TAP TSI Annex II, in the cases in which harmonized standards or ERA technical documents are available.
4. Review of the technical documents B.61 (Governance) and B.62 (Master plan), to incorporate the changes made in these documents during the TAP TSI phase 2.

Further chapters of the TAP TSI, e.g. chapter 7 – Implementation, were not part of the initial scope of this project.

2.2.1.   Scope change

During the discussion of the TAP TSI in the revision working party it has been recognized, that the scope has to be changed slightly. The change of the scope affected the following chapters:

4.2.11.3.Fulfilment – direct – domestic sales

6. Assessment of conformity and/or suitability for use of the constituents and verification of the subsystem

7. Implementation

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[1] https://data.consilium.europa.eu/doc/document/ST-14047-2019-INIT/en/pdf

The reasons for the change of the scope of those chapters were the following ones: The open point "4.2.11.3. Fulfilment – direct – domestic sales" – initially not foreseen for the revision - could be solved by already available technical documents specifying the domestic ticketing. The new technical document B.11, necessary for the open points 4.2.11., covered as well fulfilment methods for the domestic ticketing.

The change of the scope to modify the chapter 6 of the TAP TSI was mainly driven by the revision of the TAF TSI. The TAF TSI revision working party introduced a change concerning the conformity assessment for the TAF TSI. To keep both regulations consistent, the TAP TSI revision working party had to discuss the proposal as well.

The chapter 7 had to be changed to accommodate the modified TAP TSI governance structure and to take into account the changes triggered by the adaption of the TSI to the further development of the technical documents B.61 (Master plan) and B.62 (Governance) in the TAP TSI phase one and two. Those changes required a significant modification of the chapter 7, mainly removing the outdated requirements of the TAP TSI implementation.

The scope changes have been submitted to the TAP TSI revision working party in the meeting on 24 September 2019.

2.3. Objectives

The main objectives of the project is the revision of the TAP TSI to incorporate changes in the legal text and in the annexed technical documents.

The detailed objectives of the project as specified in the terms of reference were:

Table 1: TAP TSI revision objectives

	Basic parameter	Objective	Measures
Revision of TAP TSI chapter 4 (RU/IM basic parameters)	4.2.16/ 4.2.15	Facilitate the processing of passengers' complaints according to the passenger rights regulation 1371/2007 for the RU'S by storage of the TrainRunningMessages for 12 months.	The storage of 'TrainRunningInformationMessage' and 'TrainRunningInterruptionMessage' shall be supported by the TAP TSI core text (see CR 144)
	4.2.12.1./4.2.13	Ensure the provision of interoperable messages for the information of the passengers in the station area and on board of a vehicle	Check if interoperable messages for station managers are needed in TAP TSI (e.g. ChangeOfTrackMessage, TrainJourneyModification), (see CR 347)
	4.2.14 – 4.2.17	Make the RU/IM communication consistent to the TAF TSI.	Removal of the technical document B.30 and replace them through a reference to TAF TSI - Annex D.2: Appendix F. Alignment of the TAP TSI basic parameters with those of the revised TAF TSI.
Closing of open points of the TAP TSI	4.2.2.1.	Ensure the possibility to exchange tariff data for domestic tariffs between the railway undertakings	A harmonized standard (e.g. NeTEx CEN/TS 16614-3) or Technical document on the process and the information used for it in respect of tariff data intended for domestic sales shall be referenced in the TAP TSI
	4.2.10	For the indirect fulfilment a common framework including the security elements has to be set-up.	A standard for the handling of security elements for product distribution shall be supported. It has to be decided in the working party, if the key

			distribution via the TAP TSI architecture can fulfil this requirement. The fulfilment "Mobile ticket" shall be elaborated, based on the existing technical specifications (e.g. TAP TSI technical document B.7) of the TAP TSI.
	4.2.11.2	Allow the international fulfilment as "ticket-on-departure" or "manifest-on-list"	The Standard CEN TS 16406 for European 'Ticket On Departure' and for European 'Manifest On List' shall be incorporated in the TAP TSI. The working party shall draft the missing parts of this Standard and incorporate them in the TAP TSI.
	4.2.22	To ensure the exchange of fare information in the context of connection with other modes of transport	The Standard NeTEx (CEN/TS 16614-3) for the exchange of fare information in the context of connection with other modes of transport has to be incorporated in the TAP TSI.
	4.2.11.4	Technical document or standard on indirect fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales	The usage of the TAP TSI technical document B.7 for domestic indirect fulfilment shall be elaborated in the TAP TSI working party.
Revision of technical documents B.61 and B.62	Annex V	To incorporate the changes of the documents during the TAP TSI phase 2.	Incorporate new versions of the technical documents into TAP TSI Annex V.
Revision of chapter 4 of the TAP TSI (retail basic parameters)	4.2.1	To define clearly the role of the station manager in respect of the exchange of parts of the timetable data (e.g. station reference data such as platforms and minimum connection times)	Redefine the role of the station manager for the definition of static timetable data (e.g. minimum connection timings, links between stations). Clarify the process of data exchange between the station manager and the RU.
	4.2.22	Ensure an updated reference to the relevant standards	Replace the standards EN 12896 and EN TC 278 WI 00278207 by the Standards CEN/TS 16614-1:2014 for network and timetable data exchange, EN 28701 for IFOPT and CEN/TS 15531 for real-time data exchange.

3. Workgroups

3.1. Setup of the working party

3.1.1. Setup of the project

ERA has created in 2015 a project for the revision of the TAP TSI. ERA drafted the internal project documentation and identified the topics to be discussed in the revision of the TSI. A first draft of the topics to be addressed in the TAP TSI revision has been presented in the ERA economic survey group on 17 June 2015. Based on the discussions with the involved stakeholders it has been decided by ERA, that a preliminary impact analysis of the topic would be useful to identify the problems of the TAP TSI revision and to define the proper work packages for the project.

ERA has therefore developed in 2015 an early impact assessment for the revision of the TAP TSI. ERA has identified the following topics, to be addressed in the TAP TSI revision:

› Revision of the chapter 4 of TAP TSI to incorporate important change requests stemming from the TAP TSI change control management and the TAP TSI implementation phases 1 and 2 with an impact on the definition of the TAP TSI basic parameters.

› Revision of the chapter 4 of TAP TSI /RU/IM-communication)

  › Facilitate the processing of passengers' complaints according to the passenger rights regulation 1371/2007 for the RU's by storage of the TrainRunningMessages for 12 months.

  › Ensure the provision of interoperable messages for the information of the passengers in the station area and on board of a vehicle

  › Make the RU/IM communication consistent to the TAF TSI.

› Closing of the open points of the TAP TSI Annex II, in the cases in which harmonized standards or ERA technical documents are available

  › Ticketing: ticket on departure, manifest-on-list

  › Tariff data exchange for other modes of transport and for domestic rail tariffs

› Review of the technical documents B.61 (Governance) and B.62 (Master plan)

This document about the impact assessment has been presented in a meeting on 10. September 2015 to the recognised parties of ERA, including the representatives specific for the TAP TSI (ticket vendors, rail passenger representative). During this meeting the participants agreed with the proposed scope of the TAP TSI revision with ERA and proposed the following amendments of the work packages:

- Harmonized Definition of departure time for passenger information shall be discussed in conjunction with the minimum connection timing
- Innovative projects (e.g. Shift2Rail) and the "Report on delivering multimodal integrated ticketing in Europe" of the European Parliament shall be taken into account for the scope of the project
- The proposal to remove the technical document B.30 – RU/IM communication - is accepted by the sector. The incorporation of ChangeOfTrack- and ChangeOfJourney-messages and the storage of TrainRunningMessage and TrainRunInteruption-message shall be incorporated in the work programme.
- Improved passenger experience starting from timetable information until booking shall be put into the work programme
- The governance for the management of minimum connection times (MCT) should be defined
- Ticketing shall be simplified for the end customer
- Mobile ticketing shall be taken into account

Based on this input ERA has drafted in spring 2016 the document "Strategy for Telematics Applications for Passengers (TAP) 2025". Most of the proposals were taken into consideration, only the topic "Innovative projects (e.g. Shift2Rail) and the "Report on delivering multimodal integrated ticketing in Europe" could not be accommodated in the work programme, because of the non-availability of the results in the project initiation phase.

The following strategic objectives where set-out in the TAP TSI strategy document:

SO 1 - Ensure that passengers, third parties and other modes of transport can access all up-to-date pre-trip info (timetable and tariff data) and can buy valid tickets (easily) EU-wide

SO 2 - Ensure the exchange of timetable and tariff information with the other modes of transport

SO 3 - Safeguard RU's revenues from multi-carrier/issuer e-tickets

SO 4 - Ensure that passengers, third parties, RUs and neighbouring IMs and other modes of transport can access all during-the-trip rail data (as deviation from plan, service disruption, train running forecasts,…)

SO 5 - Facilitate passenger complaints after the trip according to passenger rights regulation EC 1371/2007 by access to at least 12 months historical data

This document served as basis for the development of the TAP TSI revision project plan. The project plan has been approved by the ERA management board on 9. September 2016.

Due to the ongoing revision of the Rail passenger rights regulation, the strategic objective "SO 5 – facilitate passenger complaints" needs probably a review during the project execution, once the revised rail passenger rights regulation EC 1371/2007 is available. The rail passenger rights recommendation has not been published until December 2019. Therefore the basic parameters affected by the passenger rights regulations (e.g. storage of TrainRunningInformationMessage) were changed based on the draft proposal from the European Commission [6].

3.1.2. Setup of the working party

A working party for the revision of the TAP TSI has been established by ERA.

For the appointment of the experts for the working party, ERA has prepared a call for experts and submitted to the ERA recognised bodies and NSA's on 22 December 2016. ERA has received from them until 22 February 2017 the contact details of the appointed speakers and deputy speakers for the working party.

The working party has been composed of the following organisations and speakers:

Table 2: appointed speakers for the working party

Stakeholder / NSA	Official Speaker 1	Official Speaker 2
NSA ES	García Lozano Vanesa M.	Ana Rodríguez Fernandez
NSA DE	Dr. Claudia Schmidt	
NSA SE	Lina Andersson	Jäderholm Maria
NSA BG	Mrs. Svetla Kostadinova	
NSA RO	Mrs. Manuela BUNEA	Mrs. Carmen POPISTEANU
NSA SI	Zdenko ZEMLJIČ	
NSA FI	Ms Une Tyynilä	
NSA FR	Mr. Mathieu Goulard	

Stakeholder / NSA	Official Speaker 1	Official Speaker 2
NSA/NCP HR	Mr Tihomir Pleša	
CER	Ms. Roberta Rizzo	Christian Weber
EIM	Patrick Konix	Javier Moreno
EPF	Mr. Rian van der Borgt	Mr. Willy Smeulders
UITP	Kimiko Sörensen	Ms. Elke Fischer
UNIFE	Marcel Muchow	Miroslav Haltuf
ECTAA	Ms. Christine Baal	
EU TRAVEL TECH	Patrick Heuguet	David Classey
UIC	Fabrice Setta	Clemens Gantert

The composition of the working party has been changed during the project as described in the following table. The recognised body ALLRAIL, accepted as recognised body since September 2018, joined the revision working party from September 2019.

Stakeholder / NSA	Originally appointed Speaker	Replaced by
EIM	Javier Moreno	Will Deakin
NSA DE	Dr. Claudia Schmidt	Jan Möllmann
NSA SE	Lina Andersson	Lovisa Arrias
ALLRAIL		Barbara Mickova
ECTAA	David Classey	N/A
UITP	Kimiko Sörensen	Johan Hamar

4.   Working methods

The Agency is chairing, managing and coordinating the WP for the revision of the TAP TSI. ERA applies relevant internal procedures and guidelines (e.g. procedure on issuing a recommendation or guide for drafting TSIs).

To facilitate exchange of documents, an extranet workspace of the project was established at: https://extranet.era.europa.eu/TAP-TSI/SitePages/Home.aspx . This workspace is accessible for the members of the working party, their deputies and all members of the Agency involved in this discussion.

Furthermore ERA has set-up a management tool for the management of the changes of the TAP TSI legal text and the supporting technical documents. For this purpose ERA has modified the tool for the change control management of the TAF/TAP TSI technical documents and made this tool available on the ERA-website https://ccm.era.europa.eu/cqweb/ in the database TEREV. In this tool all topics concerning the changes, requested for the TAP TSI revision were logged and published to the working party. All proposed changes were discussed in the working party and the status of the change requests have be changed according to the decisions in the working party.

For the management of the changes of the technical documents of the TAP TSI, a change control management procedure is in place, as requested in chapter 7 of the TAP TSI.. The changes on the technical documents during the revision of the TAP TSI were not managed through this change management procedure. The changes were discussed in common with the changes of the legal text of the TAP TSI.

The representative organisations were required to ensure continuity of their representative members for the duration of the WP. Whenever possible, the representative members were required to express their organisation's position in advance of the WP meetings through written methods, such as commenting on the draft documents or the draft minutes of the WP meetings.

In order to achieve a common and agreed position of their organisation, the members should have shared pre- and post- meeting information within their organisations. The organisations were expected to facilitate the internal exchange of opinions and the elaboration of their position, for instance through 'mirror groups'.

The text of the recommendation – based on the current state of the discussion – was always available to the members of the working party through the TAP TSI revision working party extranet.

4.1.   Meetings of the working party

The working party had the following meetings:

Meeting	Date
TAP TSI Revision working party Kick-off	04.04.2017
1st meeting TAP TSI Revision working party	11.-12.07.2017
2nd meeting TAP TSI Revision working party	10.-11.10.2017
Preparatory meeting TAP TSI Revision	17.12.2017
3rd meeting TAP TSI Revision working party	23.-24.01.2018
4th meeting TAP TSI Revision working party	10.-11.04.2018
5th meeting TAP TSI Revision working party	10.-11.07.2018
Workshop presentation of the study "Study for an analysis of domestic rail tariffs"	07.09.2018
6th meeting TAP TSI Revision working party	09.-10.10.2018

Meeting	Date
7th meeting TAP TSI Revision working party	19.-20.03.2019
8th meeting TAP TSI Revision working party	18.-19.06.2019
9th meeting TAP TSI Revision working party	24.09.2019
10th meeting TAP TSI Revision working party	11.12.2019

The participation in the meetings of the TAP TSI revision working party:

Table 3: Working party meetings participation

Stakeholder / NSA	Kick off	1	2	3	4	5h	6	7	8	9	10
NSA ES											
NSA DE	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y
NSA SE	Y			Y		Y	Y	Y	Y	Y	Y
NSA BG											
NSA RO	Y	Y	Y	Y	Y						
NSA SI	Y	Y	Y	Y							
NSA FI	Y	Y	Y			Y	Y	Y	Y	Y	
NSA FR											
NSA/NCP HR		Y									
CER	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EIM	Y	Y	Y	Y	Y	Y	Y				
EPF	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
UITP	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
UNIFE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ECTAA	Y										
Eu Travel Tech (ETTSA)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
UIC					Y	Y	Y	Y	Y	Y	Y

The working party was very active and proposing as well written proposals concerning the topics of the revision of the TAP TSI.

5. Main aspects covered

Based on the project plan for the revision of the TAP TSI, the working party focused on the following points:

1. Revision of chapter 4 of the TAP TSI (RU/IM basic parameters)
2. Closing of open points of the TAP TSI
3. Revision of chapter 4 of the TAP TSI (retail basic parameters)
4. Revision of technical documents B.61 and B.62

5.1. Input documents

For the revision of the TAP TSI the following input documents were taken into account:

- COMMISSION REGULATION (EU) No 1273/2013 of 6 December 2013 amending Regulation (EU) No 454/2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system
- Commission Regulation (EU) 2016/527 of 4 April 2016 amending Regulation (EU) No 454/2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system
- COMMISSION DELEGATED DECISION (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability
- Technical documents referenced in the TAP TSI:

    B.1. - Computer generation and exchange of tariff data meant for international or foreign sales — NRT tickets
    B.2. - Computer generation and exchange of tariff data meant for international and foreign sales — integrated reservation tickets (IRT)
    B.3. - Computer generation and exchange of data meant for international or foreign sales — special offers
    B.4. - Implementation guide for EDIFACT messages covering timetable data exchange
    B.5. - Electronic reservation of seats/berths and electronic production of travel documents — exchange of messages
    B.6. - Electronic seat/berth reservation and electronic production of transport documents (RCT2 standards)
    B.7. - International rail ticket for home printing
    B.8. - Standard numerical coding for railway undertakings infrastructure managers and other companies involved in rail-transport chains
    B.9. - Standard numerical coding of locations
    B.10 - Electronic reservation of assistance for persons with reduced mobility — exchange of messages
    B.30. - Schema — messages/datasets catalogue needed for the RU/IM communication of TAP TSI'
    B.60 - TAP Retail Architecture
    B.61 - TAP Governance
    B.62 - TAP Master Plan

The documents were made available to the working party on the dedicated extranet.

5.2. Revision of TAP TSI chapter 4 (RU/IM basic parameters)

The following changes of the legal text, concerning the revision of the basic parameters concerning the RU/IM-communication in TAP TSI chapter 4, have been logged in the change control tool for the TAP TSI revision:

Table 4: changes concerning the revision of TAP TSI chapter 4 (RU/IM basic parameters)

Change#	Headline
TEREV00000004	Storage of TrainRunningInformation-message
TEREV00000005	Introduction of interoperable messages for station managers – change of track, modification of journey
TEREV00000007	Alignment of TAP RU/IM related BPs with TAF
TEREV00000008	Handling of innovative solutions
TEREV00000009	Handling of IT related BPs 4.2.18 to 4.2.21

These changes were discussed in the 1st, 2nd and 3rd meeting of the TAP TSI revision working party. Additionally a preparatory meeting between CER, EIM and ERA took place in December 2017 to discuss above changes and to prepare a common ingoing position for the 3rd meeting of the working party, where the topics were finally decided.

5.2.1. Storage of train running information

Another drivers of changing the TAP TSI RU/IM basic parameters was the rail passenger rights regulation (EC) 1371/2007. To fulfil their obligations stemming from article 17 of the regulation (EU) 1371/2007 concerning the compensation of the ticket price, the railway undertaking has to be able to analyse the historical delay data of trains. For this reason the TAP TSI requires in chapter "4.2.16. Service disruption information" to store the service disruption data for at least 12 months to facilitate the passenger complaints.

The main purpose of this change was to improve the handling of passenger complaints by storage of the delay information. The ingoing position of ERA was to enhance the TAP TSI basic parameter 4.2.15.1 by the following phrase: *"For the purpose of dealing with passengers' complaints, train running information message data shall be kept available for railway undertakings, ticket vendors and/or authorised public bodies for at least twelve months after the basic parameter has expired."*

During the discussions in the working party it was mainly discussed, if the message itself or the data contained in the message shall be stored by the IM. It has been agreed that the data, contained in the messages shall be stored instead of the message. It has been agreed that the following values shall be stored by the IM: train identification (train number) and Train ID, reporting location, actual date/time, delay and delay cause. The data shall be available for at least twelve months after the service train termination.

It was agreed in the working party that the timeframe has to be checked with the final text of the revised passenger rights regulation. Due to the ongoing discussion of the Rail Passenger Rights regulation, the

5.2.2. Introduction of interoperable messages for station managers – change of track, modification of journey

This change proposal was submitted to harmonise the data provision for the TAP TSI basic parameter "4.2.12. Handling of information provision in the station area". The passenger has to be informed in the station by the station manager about the trains operating as planned and about the deviations from the planned train operation. Those deviations may include the change of the planned track, the train will arrive or depart, and as well if the station will not be served at all by a given train. For the latter cases there is no specific message defined in the TAP TSI to be send by the IM to the station manager. However those messages exists in the message catalogue of the rail sector.

The proposal has been discussed, but the WP was not in favour to accept this proposal. The sector argued, that such a message is available in the data catalogue of the sector. There is no need to regulate therefore the message exchange further in the legislation. The common conclusion of the discussion was that there is no real need to use this proposal so it is commonly rejected and there won't be any further actions.

5.2.3. Alignment of TAP RU/IM related BPs with TAF

The main goal of the change was to harmonise the TAP TSI basic parameters concerning the RU/IM-communication with those from the TAF TSI. Both regulations share the same basic parameters for the RU/IM-communication and therefore a harmonisation will facilitate the implementation of TAF and TAP TSI.

For historical reasons the TAP TSI has created a separate technical document for the RU/IM-communication, containing the messages for the RU/IM-communication. The messages are shared with the TAF TSI. The format and the processes for the message exchange are the same. The accommodation of those messages in two different technical documents in the annexes of TAF TSI and TAP TSI created additional effort for the management of them.

Therefore ERA proposed to harmonise the chapters concerning the RU/IM-communication between TAF and the TAP TSI and to abolish the TAP TSI technical document B.30 and replace the reference to the technical specifications by a cross-TSI reference to the TAF TSI appendix F.

The working party discussed the ingoing proposal of ERA. This proposal has been revised by CER and presented in the WP. This CER proposal concerning the changes of the TAP TSI BPs 4.2.12 to 4.2.17 discussed in the WP. The main points addressed in the discussion were the following:

- Harmonisation of the legal text between TAP and TAF TSI
  This harmonisation took place by alignment of the TAP and TAF TSI related basic parameters for the RU/IM communication. The content of the TAF TSI has been introduced in the TAP TSI.
- Introduction of the term "Soft compliance" in the TAP TSI
  The proposal to introduce "Soft compliance" in the TAP TSI will be removed as this topic is still under discussion within the TAF TSI and ERA and is too early to accept this topic for the TAP TSI. The topic was not introduced in the scope of this revision.
- Harmonisation of the IT related basis parameters
  In this discussion the basic parameters for the IT related topics, the basic parameters 4.2.18-4.2.21 were discussed. It has been decided by the working party to adapt solely the basic parameter 4.2.19.1. Reference Files.

In October 2018 ERA has started a parallel working party concerning the revision of the TSI telematics applications for freight (TAF TSI). The scope of this working party was a partial revision of the TAF TSI, focused on the following TAF TSI functions:

- Soft compliance
- Inclusion of available ELETA elements for ETA calculation
- Better access to tracking data for customers

The points "Soft compliance" and "Better access to tracking data for customers" had an impact on the TAP TSI revision. To avoid inconsistencies between the TAF TSI and TAP TSI the working party for the revision of the TAF TSI has proposed to harmonise the wording further. This proposal has been discussed in the 8th, 9th and 10th meeting of the TAP TSI revision working party. The shared basic parameters of both TSI's for RU/IM-communication are harmonised as much as possible, by:

- harmonising the exact wordings of the basic parameters of both regulations
- reorder of the chapters, e.g. Path not available message, to be in line with the TAF TSI

The remaining differences between the both TSI's are purely passenger related requirements, such as for the storage of TrainRunningInformation. This may support the ongoing discussion about the creation of a single telematics TSI, applicable for passenger and freight operations.

5.2.4.   Handling of innovative solutions

CER proposed to include a specific chapter in the TAP TSI covering the rules for the application of innovative solutions. CER argued that those procedures exists already for other TSI's, such as structural ones like Commission Regulation (EU) No 1302/2014 (RST TSI). This would facilitate the introduction of new solutions in the TAP TSI, e.g. for ticketing.

ERA proposed not to incorporate a separate chapter concerning innovative solutions in the legal text of the TAP TSI. The main reason for the decision is the coverage of changes in the technical documents of TAP TSI by a change control management process. Only in case of a modification of the legal text a revision should be requested at EC. It has been proposed to adapt the change control process for TAP TSI. This has been accepted by the WP.

5.2.5.   Handling of IT related BPs 4.2.18 to 4.2.21

This topic has been raised by CER mainly with the goals to simplify the IT-related TAP TSI basic parameters with the aim is to align TAF and TAP and simplify the 2 documents.

ERA argued the purpose of TAP revision: the aim was to align TAP and TAF TSIs, not to create new differences. For instance, if WP would remove certain parts of TAP TSI such as the requirements for databases, it would trigger the need for TAF TSI also to be revised in order to fulfil the alignment goals. ERA see a risk with creating new inconsistencies between both TSIs, which would impose an obligation on any future TAF TSI revision. The scope of the change has been limited to the removal of those reference files, which were already removed in the TAF TSI .

In the 2nd wave of the harmonisation of the TAF and TAP TSI basic parameters took into account again changes for the basic parameters 4.2.18 to 4.2.21. The changes were triggered by modifications of the TAF TSI in the TAF TSI revision working party in 2019.

For these changes, relevant for the harmonisation between the TAF and the TAP TSI for RU/IM basic parameters, the working party reached a consensus and agreed to the modifications of the chapter 4 of the TAP TSI. This has been finally accepted in the meeting of the 10th TAP TSI revision working party.

5.2.6.   Change of the glossary for harmonisation with the revised TAF TSI

Due to the revision of the TAF TSI, several items of the glossary have been modified, removed or introduced by the TAF TSI working party. Because of the shared glossary items between TAF and TAP TSI the TAF TSI revision working party recommended to modify the glossary of the TAP TSI as well. The working party agreed to this proposal in the 10th meeting of the working party.

5.3.   Closing of open points of the TAP TSI

The TAP TSI contained in ANNEX II a list of open points. Those open points were addressed during the drafting phase of the TAP TSI in 2007 - 2010, but could not be covered by technical standards, which were not available at this time. The following table shows those open points from the annex II of the TAP TSI:

Table 5: List of open points of the TAP TSI

Section	Open points
4.2.2.1.	Technical document on the process and the information used for it in respect of tariff data intended for domestic sales
4.2.10.	Standard for the handling of security elements for product distribution
4.2.11.2	Standard for European 'Ticket On Departure' and for European 'Manifest On List'
4.2.11.3	Technical document or standard on direct fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales
4.2.11.4	Technical document or standard on indirect fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales

4.2.22	Standard for the exchange of fare information in the context of connection with other modes of transport

According to article 3 of the TAP TSI, ERA had to submit a recommendation about the closing of the open points by March 2012. In 2012 neither the needed harmonized standards nor ERA technical documents were available to close these open points. Therefore ERA has submitted in March 2012 a progress report ERA/REP/03-2012/INT [1] about the closure of the open points and has outlined their status and their inter-dependencies.

One of the goals of the revision of the TAP TSI was the closing of these open points, except of the open point "4.2.11.3 Technical document or standard on direct fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales". For this open point it has been discovered, that there is no European standard available and therefore ERA could not propose a solution proposal for the closing.

ERA has submitted for each of the open points a solution proposal, explaining how to close them. The solution proposals were based mainly on available European standards for the tariff data exchange and for the interoperable ticketing.

The following changes of the legal text have been logged in the change control tool for the TAP TSI revision:

Table 6: changes concerning the closure of open points

Change#	Headline
TEREV00000006	Fulfilment as ticket on departure or manifest on list
TEREV00000012	Ensure the exchange of fare information in the context of other modes of transport
TEREV00000017	Exchange of tariff data - domestic tariffs
TEREV00000014	Closing of the open point "4.2.11.4 Technical document or standard on indirect fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales"
TEREV00000015	Closing of the open point "4.2.10 Standard for the handling of security elements for product distribution" - fulfilment as mobile ticket

5.3.1. *Fulfilment as ticket on departure or manifest on list*

During the drafting of the TAP TSI a requirement for the so called indirect fulfilment has been incorporated in the basic parameter "4.2.10. Handling of security elements for product distribution" . Indirect fulfilment means, that the travel document is based on an electronic check of the validity and cannot be proof by the ticket itself, e.g. if the ticket is printed on ticket paper with a security background. This basic parameter specifies the manner in which the attributing railway undertaking shall generate security elements for the distribution of its products. The intention of the drafting of this basic parameter was to facilitate the indirect fulfilment of tickets as dematerialized ticket, only available electronically.

Indirect fulfilment methods are already covered in the TAP TSI in the basic parameter 4.2.11.2. Fulfilment — indirect — for international and foreign sales. This basic parameter is further specified by the TAP TSI technical document B.7, based on the UIC leaflet 918-3. The rights for publication and modification of the UIC leaflets 918-1, 918-2 and 918-3 concerning standards for international ticketing for were purchased in 2009 by ERA. Beside of their publication as UIC-leaflet, they are available as well as TAP TSI technical documents B.5, B.6 and B.7. The maintenance of these documents – e.g. the management of changes - is subject to an agreement between ERA and UIC.

For the purpose of standardisation of electronic ticketing ERA has submitted in 2008 a request for standard, asking the "Comité européen de normalization (CEN)" for a proposal for a standard to accommodate the

fulfilment methods "Ticket-on departure" and "Manifest-on-List". Those fulfilment methods can be described as follows:

- "Ticket on departure" is a security-paper based ticket, which can be picked-up by the passenger at a vending machine in a railway station.
- For the fulfilment "Manifest-on-list" the ticket is only available electronically and the passenger has to be identified during the on-board ticket check, e.g. by a passport or ID-card.

The document describing those fulfilment methods has been published in 2013 as CEN technical standard CEN/TS 16406.

ERA analysed the proposed technical standard CEN/TS 16406. The analysis has shown, that the delivered document has to be enhanced to cover all requirements from the TAP TSI, e.g. ticketing for flexible tickets (Non-reservation tickets – NRT). ERA did those adaptions and agreed with CEN to incorporate some chapters of the CEN/TS 16406, as requested within the standard, into the TAP TSI technical document B.5.

ERA proposed to the TAP TSI revision working party to modify the TAP TSI technical document B.5. The ingoing position of the Agency has been discussed in the 1st , 2nd and 3rd meeting of the TAP TSI revision working party. UIC could attend with their experts for ticketing for the first time in the 4th meeting of the working party. In the discussions during the 4th meeting UIC informed the participants that the UIC leaflets 918-1, 918-2 and 918-3 are currently under revision at UIC: UIC has recently changed significantly the content of the UIC – leaflets 918-2 and 918-3. Those leaflets have been restructured and the content has been put into two new UIC-leaflets 918-8 and 918-9, repealing the leaflets 918-2 and 918-3. Additionally UIC has modified the UIC leaflet 918-1, adding new functions supporting e-ticketing. Chapters, essential to ensure interoperability, of the UIC leaflets 918-1, 918-2 and 918-3 are equivalent to the TAP TSI technical document B.5, B.6 and B.7 concerning ticketing.

UIC stressed, that the modified UIC-documents will provide the required functions for the fulfilment methods "Ticket-on-departure" and "Manifest-on-List", as requested by TAP TSI open points. Furthermore UIC stressed, that the proposed standard CEN/TS 16406 does not reflect all requirements of the rail sector for the e-tickets, e.g. the requirements stemming from the regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. UIC recommended to the working party to update instead the existing TAP TSI technical documents taking into account the changes at UIC. This approach would fit to the requirements of the European rail sector.

The working party accepted the approach, not to incorporate the content of the standards CEN/TS 16406 into the TAP TSI technical document B.5. Due to the reshuffling of the content of the UIC-leaflets 918-2 and 918-3, it has been proposed by ERA to create two new ERA technical documents and repeal the existing TAP TSI technical documents B.6 and B.7.

The working party agreed with this proposal. ERA created two new technical documents B.11 and B.12. The document B.11 covers the layout of the tickets whereas the technical document describes the security element handling of those tickets. The technical documents have been revised and accepted by the working party.

Furthermore the working party agreed to a full review of the technical document B.5, including the requirements for fulfilment methods. The main changes on the technical document B.5 are related to:

› Introduction of a full implementation of XML-based messages for booking
› Limited implementation of e-ticketing in the binary messages for booking

To fulfil the following requirements

› to allow the customer to travel by personal data
› to allow the customer to travel by id
› to allow the customer to download a boarding pass from the carrier
› to ensure the compliance with GDPR

The objectives and additional functions have been presented by ERA and UIC in the 5th meeting of the working party. UIC and ERA have reviewed the technical document B.5 in several bilateral meetings and telephone conferences. The revised document B.5 has been presented in the 6th meeting and accepted by the working party.

Another important topic for the ticketing discussed in the working party was the usage of the security elements. For the encryption of the security elements for ticketing a so called asymmetric encryption is used. This means for each encrypted information a key-pair of a public and a corresponding private key is available. The private key is kept secret by the ticket issuer, the public key is made available publically to allow the verification of the authenticity of the ticket. The sender of the ticket with the security certificate is undersigning the content of a ticket with his private key. Any modification of the content of the ticket (e.g. travel class, destination) will breach the signature. The reader of the ticket can use the public key to check, if the ticket signature has been modified. So the key problem in the distribution of those tickets is the question, if a given public key belongs to the issuing ticket vendor or railway undertaking or has been modified by an attacker.

Concerning the ticketing one topic is important to avoid ticket fraud: The exchange of security elements, ensuring the authenticity of the ticket. For the classical rail tickets the authenticity is ensured using security paper with a predefined background and stock control for the issued tickets. For electronic tickets this is not applicable. For rail those security elements are in most cases optical readable barcodes, The current mechanism to ensure the authenticity of electronic tickets is the usage of asymmetric keys, a private key only known by the product owner and a public key, used by the ticket-control organisation to verify the ticket. The keys are used to sign the barcodes printed on the tickets. The ticket control organisation (TCO) can then check the authenticity of the ticket by checking the barcode and the encrypted seal. The public keys can be exchanged based on the TAP TSI architecture, where the public keys have to be made available by the product owner. In the current setup the authenticity of the public keys cannot be guaranteed, because no trusted party may verify if the publisher of a public key is the organisation pretend to be the issuer of this key. The CEN/TS 16406 recommended: To check that the digital certificate is authentic, the ticket controller can check with any suitable trust company, who can confirm that the certificate is actually from the named key holder. This means such a trust company has to be introduced for the exchange of security elements.

ERA proposed to enhance the existing security mechanism by enforcing the use of a public-key-infrastructure (PKI) for the railway undertakings. Instead of the publication of a public key, the product owner shall publish a certificate, means a public key approved for authenticity by a trusted company.

Initially ERA proposed 2 options:

> Option 1 – Distribution of Public Keys only via TAP KEY REGISTRATION AUTHORITY

> Option 2 – Distribution of Security Certificates only via TAP KEY REGISTRATION AUTHORITY

Option 1 is the preferred option by ERA, because of the lower cost impact for the rail sector. It would mean that the main important requirement is the setup of a registration authority(RA)[2] to verify the identity of the submitter of a public key. Regarding the "TAP key Registration Authority", the selection of the TSGA shall be proposed by the TAP TSI. It was proposed by ERA that Governance entity (as defined with TSI; commonly known as TSGA) will perform the role of the Registration Authority. In the discussion the rail sector expressed the concern, that TSGA could not fulfil this role and that this would bring additional workload and costs for TSGA. Furthermore it has been recognised, that in this case the management of keys instead of certificates will not improve the security level for the ticketing.

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[2] A registration authority (RA) is an authority in a network that verifies user requests for a digital certificate and tells the certificate authority (CA) to issue it.

In the 10th meeting of the working party, the following compromise could be reached: *To check the authenticity of the security elements by the TCO, a public key infrastructure (PKI) has to be used by the railway undertakings and ticket vendors creating those security elements for electronic delivery.*

For the indirect fulfilment, the exchange of ticket control data is an important aspect. Due to the nature of these travel documents to be printed on plain paper, the authenticity can be checked only through a backend system, checking the security elements. This task is fulfilled by the ticket control organisation (TCO). For the resulting control data no common message exchange nor structure is in place. The check of the ticket can be done solely based on bilateral agreements resulting in a significant increased risk concerning ticket fraud. The working party recognised the fact that in this case an interoperable data exchange of control data and ticket status changes (e.g. ticket reimbursed ?) is in place. ERA proposed in the 8th meeting of the working party to incorporate a new open point in the TAP TSI concerning the interoperable data exchange of ticket control data between the ticket control organisation and the issuer of the ticket (e.g. railway undertaking or ticket vendor). ERA proposed to introduce a new basic parameter "4.2.12. Handling of ticket control and ticket state modification data". The proposal has been accepted by the working party.

5.3.2. Ensure the exchange of fare information in the context of other modes of transport

This change - proposed by ERA - introduced the usage of the standard CEN/TS 16614-3:2015 (NeTEx) for the exchange of fare data between rail and the other modes of transport. The working party agreed with the proposal of ERA.

ERA has received for the 9th meeting of the working party comment from CER, that the proposed wording should take into account the requirements stemming from the regulation (EU) 1926/2017 shall be taken into account and the basic parameter shall be reformulated as follows: *"For the exchange of tariff data between railway undertakings and other modes of transport: The technical standard CEN/TS 16614-3:2015, and subsequent versions, or any machine-readable format fully compatible and interoperable with those standards or technical documents should be used."* This avoids any conflict between both regulations concerning the data format to be used. The proposal has been accepted in the 10th working party.

5.3.3. Exchange of tariff data - domestic tariffs

This change is requested by the open point "4.2.2.1. Technical document on the process and the information used for it in respect of tariff data intended for domestic sales". The goal of this change is to allow the data exchange of domestic railway tariffs in standardised format.

ERA has elaborated in the preliminary impact assessment the standards available for the fare exchange of domestic fares. There is no public available standard for the exchange of domestic railway tariffs in place, allowing the accommodation and the exchange of all domestic products.

Therefore ERA has launched in 2017 a study "Tariff data exchange for domestic rail tariffs" to evaluate if the existing standard CEN/TS 16614-3:2015 (NeTEx) can be used to fulfil the requirements to accommodate the domestic fares for rail. The study have been executed by the consulting company NK. In the study around 1800 existing domestic railway tariffs in Europe have been analysed and their parameters have been compared with the capabilities of NeTEx. The study has clarified, that most of the parameters of the existing domestic railway tariffs can be accommodated in NeTEx. The study is available at the website of the Agency[3].

To present the content of the study and to discuss the results, ERA invited on the members of the working party or representatives, nominated by the recognised bodies, for a workshop the discuss the results of the study. ERA asked the participants in the invitation as well to provide examples of domestic rail tariffs for analysis if they can be accommodated in the standards CEN/TS 16614-3:2015. This workshop took place on 7 September 2018.

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[3] https://www.era.europa.eu/sites/default/files/library/docs/studies/tariff_data_exchange_for_domestic_rail_tariffs_en.pdf

The presentation shown numerous tariff and fare examples and variations coming from EU member states, together with NeTEx possibilities to accommodate those. Overall 1800 products were analysed. The gap Analysis has been emphasized at the last part of presentation: It has been shown by the consultant, that the analysed railway tariffs could be accommodated in NeTEx and no real "Show stoppers" could be found. Only small gaps were found. A gap in the study has been defined as:

1. An essential feature used to distinguish tariff prices that is that cannot be handled by NeTEx 1.1
2. A desirable feature, such as a complex condition of use, that is not currently represented quantitatively in machine readable form in current data sets but could or should be
3. A feature affecting derivation of fares or pricing that does not need to be exposed to the customer – e.g., detailed routing constraints

Most of the gaps found are linked to optimisations and the reduction of the volume for the data exchange. No missing feature or feature too difficult to implement could be found. The most crucial gap found was the non-availability of detailed seating plans for the railway vehicles. This is currently not covered by the NeTEx standard and would be useful for the use cases for the shopping of rail tickets. ERA emphasised, that this use case is not part of the fare exchange basic parameter of the TAP TSI. However the TAP TSI basic parameter 4.2.9 Handling of availability/reservation covers the reservation of seats/berths in a train, allowing as well the selection of specific coaches and seats to be used for the reservation. The exchange of seat plans is for the time being not foreseen to be covered in the TAP TSI basic parameters. Furthermore UIC explained, that there is already an UIC leaflet available covering this topic.

The presentation covered as well three domestic railway tariff examples (Romania, UK and cross-border & interregional tariffs between Germany, Czech republic and Poland). Those examples have shown, that

CER expressed the need for impact analysis, claiming it is too early to conclude there are no "show stoppers" in NeTEx implementation for domestic fares. However no tariff example – not being able to be modelled with NeTEx - could be shown by the participants. ERA reminded the participants that no examples of domestic rail tariffs have been submitted to ERA, as requested in the invitation for the workshop.

It has been requested by several participants (UNIFE; UIC) that an Impact analysis has to be done for the TAP TSI revision, especially for this basic parameter. Main purpose of the data exchange has been asked by the participants: passenger information vs. ticketing and controlling processes: ERA explained, that the passenger information is the main use case for the data exchange of domestic rail tariffs with NeTEx.

Another question discussed in the workshop was the question "Could an interface with a pricing module avoid the data exchange?" ERA explained that this proposal would not eliminate the necessity of data specifications or exchanged data. An interface needs data definition as well (e.g. for the accommodation classes, passenger profiles, restrictions of use) to be used for the request and to understand the reply. Therefore the standardisation of the data exchange for domestic rail tariffs is necessary.

Based on the study and the workshop ERA recommended to the working party in the 7th meeting the use of the standard NeTEx for the exchange of domestic railway tariffs. The proposal using solely one standard for the exchange of domestic railway tariffs has been discussed intensively in the working party.

- EU TRAVEL TECH (ETTSA) expressed their need for one single standard to be used for the exchange of fares. Any approach with more than one standard would create bigger distribution costs, because different models have to be taken into account.
- CER underlines that the sector is in favour of NeTEx, or any additional standard, but it shall be considered as a possible option and not in substitution of the TAP format. Being obliged to adapt to a different format would have huge impacts on railways from an IT and an economic perspective, bringing undue costs to deal with such an obligation that does not seem to provide remarkable benefits to the end users. Railways should be able to choose which profiles they use: either the ones that replicate the existing Technical Document messages or those that implement the national standards used for Open Data access and where the RU has domestic obligations to make data available.CER argued that NeTEx is not able to cope with all railway the exchange of yield managed tariffs (e.g. but only of static tariffs). No evidence to this statement has been given by the rail sector.

ERA remarked, that NeTEx provides the necessary parameters to obtain the fares for a given tariff via a pricing engine (see chapter 4.3 of the study about the accommodation of domestic fares [2]: *"It is also possible to indicate that some or all prices are supplied dynamically through a pricing service, as for many yield managed products."*) So the standard allows at least that the conditions and rules of a yield managed fare can be exchanged.

- NCP DE brought up the topic of PSO and asked for careful special review as requirements may substantially vary. CER questioned the need for one single standard when there are already national standards that railways are obliged to use, which are defined by Regional and local Authorities dealing with PSO.
- UIC questioned whether NeTEx could become obsolete after some years. ERA clarified that the benefit of NeTEx is that it is in fact a semi-formal description of a tariff model (due to the usage of CEN 12896 (Transmodel) as underpinning logical data model) and data exchange standard. NeTEx is therefore independent of any hardware/software evolution. However updates might be required in case of new tariff innovations not yet covered by the standard.
- ERA reminded that the EU Regulation about multimodal travel information services (MMTIS Regulation (EU) 1926/2017) already mandate these proposed standards. If the sector could demonstrate that the existing national tariff standards are compatible with the NeTEx standard, then these standards shall be considered as a valid solution as well.

In the 8th meeting CER and UIC presented their position concerning the "Exchange of domestic tariff data – NeTEx standard". The main points of their proposal were:

1. The usage of NeTEx should be voluntary, instead of mandatory use for the exchange of domestic tariffs.
2. Other standards as NeTEx should be considered, e.g. replication of the existing Technical Documents, national standards used for Open Data access, etc.
3. An impact assessment about the implications using this standard is needed.

ERA clarified, that for the domestic tariffs, there are no other existing standards than CEN/TS 16614-3:2015 at least on European scale available, which would be able to accommodate the domestic rail tariffs. The study conducted by ERA has shown furthermore that the standard CEN/TS 16614-3:2015 would be able to accommodate the domestic railway tariffs. Therefore, the discussion in the working party is not about replacing any existing European standard or TAP TSI technical document. It is focused to provide at least one interoperable standard for the exchange of domestic tariff data for rail.

The group requested an impact assessment about the introduction of the standard CEN/TS 16614-3:2015 NeTEx as the only standard for the exchange of domestic fares with the following options identified:

1. Do nothing
2. Exchange domestic tariffs in NeTEx only
   a. for the use case "passenger information" (option O1A)
   b. for the use case "sales transaction" (option O1B)
3. Exchange domestic tariffs in B1, B2, B3 and for the missing tariffs NeTEx for tariffs exchange
   a. For the use case "passenger information" (option O2A)
   b. For "sales transaction" (option O2A)

ERA has requested in October 2018 the recognised parties to nominated their experts for further questions concerning the impact analysis of the usage of NeTEx for the exchange of tariff data. ERA has sent in December 2018 a questionnaire to these experts. The Light Impact Assessment "TAP Revision 2019/20 – Closure of Open Point related to tariff data for domestic sales in TAP TSI" is available in the annex of the recommendation [3]. The results of the impact assessment have been presented in the 7th meeting of the working party. The Impact Assessment cannot identify any preferred option from a purely economic point of view as the sector cannot provide any quantitative information and evidence on costs and benefits.

The topic has been discussed in the 7th, 8th, 9th and 10th meeting of the TAP TSI revision working party. ERA ingoing proposal for the basic parameter "4.2.2.1. The railway undertaking makes available its own tariffs to other railway undertakings, authorised public bodies and third parties authorised to sell" in the 8th meeting was:

> *Tariff data intended for domestic sales shall be made available to railway undertakings and to third parties which are authorised to sell, and also to authorised public bodies, at least as long in advance as it is the case for tariff data intended for international or foreign sales.*

> *The above process and the information used for it in respect of tariff data intended for domestic sales shall comply with the technical document(s):*

>> *B.1 (See Annex III)*

>> *B.2 (See Annex III)*

>> *B.3 (See Annex III)*

>> *CEN/TS 16614-3:2015 (NeTEx)*

CER suggested in the 9th meeting modifications related to the basic parameter 4.2.2.1 (tariff data exchange) providing more flexibility on the basis of the preferred option 2b) of light impact assessment:

> *The above process and the information used for it in respect of tariff data intended for domestic sales shall comply with one of the following the technical document(s) or any format fully compatible and interoperable with those standards or technical documents:*
> *- B.1 (see Annex III),*
> *- B.2 (see Annex III),*
> *- B.3 (see Annex III).*
> *- CEN/TS 16614-3 and subsequent versions*

This proposal has been analysed by ERA and proposed for the 10th meeting of the TAP TSI revision working party.

> *The above process and the information used for it in respect of tariff data intended for domestic sales shall comply with at least one of the following technical document(s), standards or any format fully compatible and interoperable with those standards or technical documents:*

> *- B.1 (see Annex III),*

> *- B.2 (see Annex III),*

> *- B.3 (see Annex III).*

> *- CEN/TS 16614-3:2015 and subsequent versions*

This proposal has been finally accepted by the working party.

5.3.4.   Revision of chapter 4 of the TAP TSI (retail basic parameters)

The following changes of the legal text, concerning the revision of the basic parameters concerning the retail basic parameters in TAP TSI chapter 4, have been logged in the change control tool for the TAP TSI revision:

Table 7: changes concerning the revision of retail basic parameters

Change#	Headline
TEREV00000010	Clarification of the role of the station manager
TEREV00000011	Incorporation of the requirements from the revised PRM TSI

5.3.5. *Clarification of the role of the station manager*

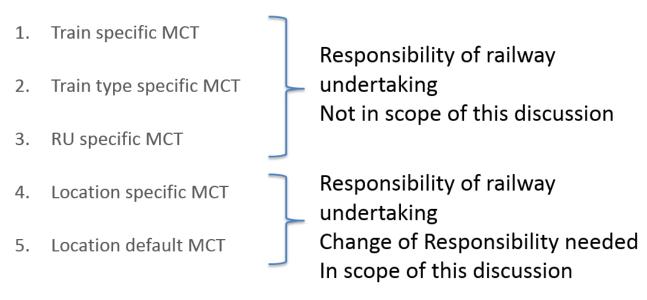### 5.3.5.1. *Definition of the minimum connection time (MCT)*

In the preliminary assessment of the TAP TSI revision the following points were identified concerning the role of the station manager:

1. There is a need for the clarification of the role of the station manager for the definition of static timetable data (e.g. minimum connection timings, links between stations). For the time being the RU's have the task to exchange timetable data, including the static data for stations. There is a risk that the railway undertakings would not act as neutral undertakings:
   a. If MCT information is not provided by the Railway undertaking (it is optional information), no journey planning is possible (unless the journey planner assumes a fictive MCT)
   b. "Market manipulation" might be possible as well by defining inappropriate MCT (e.g. more than 1h). In this case, connections, which are feasible for a customer, would not be provided by the journey planner.
2. There is a need for the clarification of the departure time applicable for the customer. The railway undertakings exchange for the time being only one departure time, valid for the operational and the published departure time for the passenger. On the other hand the passengers are obliged by the conditions of carriage for some services on some stations to board at least few minutes (e.g. 2 minutes) before the departure time indicated on the timetable or ticket. This information is not available within the timetable data. This makes it impossible to calculate a viable transfer time in a station, if the journey contains those services.
3. There is a need for the clarification of the business process of data exchange for static timetable data between the station manager and the RU's in the TAP TSI. Without the clarification there is the risk that the static timetable data will be defined by the railway undertakings without a detailed knowledge about the station. This may lead to erroneous journey information given to the customer (e.g. for timings for connecting trains).

The following objectives were set for this discussion:

1. Specify the role of the station manager for the management (definition and exchange) of the static timetable data in the TAP TSI. This management role shall be completely neutral, similar to the infrastructure manager.

2. Set up a common governance structure for all actors (IM's, SM's, RU's) for the calculation and the maintenance of the minimum connecting timings and static information's in a station.

The following picture shows the responsibilities for the definition of the minimum connection times as currently defined in the TAP TSI:

1. Train specific MCT

2. Train type specific MCT

3. RU specific MCT

Responsibility of railway undertaking
Not in scope of this discussion

4. Location specific MCT

5. Location default MCT

Responsibility of railway undertaking
Change of Responsibility needed
In scope of this discussion

The topic has been discussed in the 1st, 2nd, 3rd, 4th and 5th meeting of the working party.

ERA presented the ingoing position in the 1st meeting of the working party: The station manager should be made responsible to provide the following data concerning the minimum connection times (MCT):

- Default MCT for a station
- MCT for a transfer between two stations
- MCT for a transfer between two stations for PRM.

ERA argued, that the railway undertakings have not the knowledge about the physical layout of a station and shall not be in charge of the definitions for the MCT's, because of lack of knowledge about the station. Connection timings between specific trains, train types and railway undertakings will remain under the sole responsibility of the railway undertakings.

The following positions were explained by the participants:

In the beginning of the discussion the group has been reflected the fact that the term "station manager" is not very clear and that in some member states it might be difficult to name one body responsible to particular station. As the definition is the same as in passenger rights regulation, it has been recognised that this problem cannot be solved in TAP TSI and therefore the working party decided not to change the definition of the station manager[4].

CER proposed the following position to the working party:

- MCT should continue to be managed by RUs
- A minimum set of criteria for defining the MCT should be defined, with the RUs responsible
- Further discussion where taking place with TV's inside the TAP TSI Retail Liaison Group

EU TRAVEL TECH (ETTSA) initial position is to reach the outcome with Default (neutral) MCTs defined by a neutral party. RUs could be biased and if they are to continue with being fully in charge for defining the MCTs, then the neutrality factor would not be secured and neutrality is the key factor for EU TRAVEL TECH (ETTSA).

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[4] The most actual proposal of the recast of the rail passenger rights regulation contains the following proposal *"(3) 'station manager' means an organisational entity in a Member State, which has been made responsible for the management of a one or more railway stations and which may be the infrastructure manager"*; A new recital is proposed: *"Where there are several station managers responsible for one station, the Member States should have the possibility to designate the body in charge for the responsibilities referred to in this Regulation."*

The working party agreed to include the responsibility of the station manager for the exchange of the minimum connection timings for the following timings into the regulation:

- Connecting - Timing within the station (default minimum connection time),
- Connecting - Timing between different locations (e.g. parts of the station, platforms) within the station
- Connecting - Timing between the station and stations in the neighbourhood

It was also agreed in the WP that an entity defined by the or by default the station Manager should design a neutral process involving RU's and IM's in order to seek consensus for the definition of the relevant connection timing. In case of disputes it referred to entity defined by member state, which could be the national enforcement body.

All other connection times have to be provided by the railway undertakings.

The proposal has been accepted by the working party in the 6th meeting.

5.3.5.2. Definition of departure time

EPF emphasized in a presentation in the 6th meeting the existing discrepancies concerning the application of published departure/arrival times. Those times are not applied consistently across European railway undertakings, as it is the case for airlines. This has significantly negative impact on passengers. EPF explained the discrepancies for the usage of the departure time in Europe:

- DB, SBB: boarding possible until departure time

- NS, ÖBB (Railjet): boarding possible until 30 s before departure time

- SNCB/NMBS: boarding possible until 20-60 s before departure time (determined by train staff)

- SNCF (long distance), Thalys, RENFE: boarding possible until 2 min. before departure time

EPF has shown examples for the handling of those departure timings in journey planners across Europe, where those specifics were not taken into account.

EPF stressed that, if the management of the minimum connection times has to be changed in the TAP TSI, the handling of the departure time has to be harmonised as well. If the arrival and departure times are not defined in an unambiguous manner, then it may lead to missed connections for the passenger. EPF stressed that for the passenger only the boarding time is of interest. The operational departure time may be different, but has no value for passenger information. EPF presented 2 possible solutions for MCT and departure time:

1. Passenger can board until published departure time. (preferred option)

2. If departure times would not be harmonized, passenger shall be informed if the train closes before the published departure time.

EPF asked the working party to take this question into account for the discussion.

The topic has been discussed in the 6th meeting of the working party. The participants conclude that there is no specific economic impact for RUs related to the provision of public departure times to passengers as there is only an obligation for the RU to inform passengers about this time at the discretion of the RU.

Main discussion about the operational impact, if the public departure times would create an additional burden. ERA reminded that the technical documents for the TAP TSI allow already the exchange of different timings for operational (element TimingAtLocation, TimingQualifierCode PLD = Public Location Departure) and passenger information purposes (Technical document B.4, Level 3 - Group 7 - POR - Location and/or related time information – passenger time). Therefore such a split of the timing is already in place.

It has been proposed to introduce a new definition for the public departure time for the passenger information in the TAP TSI glossary:

- Public arrival time: Time when the passenger is allowed to disembark from the train.
- Public departure time: Time when access to the train, platform or station will be closed in preparation for departure. A boarding for the passenger has to be allowed until the time given

The proposal has been accepted by the working party in the 6th meeting.

5.3.6. Incorporation of the requirements from the revised PRM TSI

The main goal of this change request is to accommodate the description of the data model and the architecture for the exchange of PRM relevant data, as requested by the recommendation ERA-REC-128 concerning the revision of the PRM TSI (EU) 1300/2014. ERA has submitted in April 2017 the RECOMMENDATION ERA-REC-128 concerning the amendment of Commission Regulation (EU) No 1300/2014 concerning the technical specification for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility. It has been recommended by this recommendation that *"the following considerations should be taken into account by the working party in charge of revising Commission Regulation (EU) No 454/2011 (TSI TAP):*

›   *The data collected for the inventory of assets should be considered for the fulfilment of the requirement in point 4.2.6.1 of the TSI TAP relative to the "conditions of access to the station building and platforms, including whether the station is classified as accessible for PRMs and whether is staffed for PRM support",*

›   *The entities exchanging those data should be required to take part in the TAP architecture and to make those data available for transfer,*

›   *The technical documents listed in the Appendix P of the Annex should be referenced in the next revision of the TSI TAP and, from then, form an integral part of the corpus of technical documents of the TSI TAP."*

ERA presented the change for the first time in the 4th meeting of the working party. ERA proposed to change the TAP TSI basic parameter *4.2.6.1. The railway undertaking publishes information on the accessibility of rail services and on the conditions of access to rolling stock* as follows:

The railway undertaking shall publish the following information:

…

— conditions of access to the station building and platforms, including whether the station is classified as accessible for PRMs and whether is staffed for PRM support,

ERA explained that the TSI PRM shall include requirements about

- Content, functional architecture, operating mode, rules for data input and consultation, rules for self-assessment, designation of the entities responsible for data provision, timing of the establishment of the inventories of assets.

The TAP TSI TAP shall include :

- Data format and format for data exchange, technical architecture, all necessary technical documents as annexes.
- Technical documents should be subject to CCM

ERA presented the modified text in the 8th meeting of the working party. The revised TAP TSI will contain a new TAP TSI basic parameter, for the data exchange of the accessibility data by the station manager or the entity in charge of the collection of the accessibility data. Furthermore the revised TAP TSI has to take into account the requirements for the TAP TSI architecture, to exchange the accessibility data files. This proposal has been accepted by the working party.

It has been recognised during the discussion that the proposed technical documents for the exchange of accessibility data by the PRM TSI do not cover anymore the current requirements of data exchange for

accessibility data. In some member states national standards were developed to be taken into account for the data exchange. For the further development of the technical documents for the data exchange for the accessibility data, ERA proposed to establish a common working party between the TAP and PRM TSI. The proposal has been welcomed by the participants.

5.4.   Change of Annex V

The revision of the technical documents B.60, B.61 and B.62 was one of the objectives of the TAP TSI revision. The technical document B.60 - TAP RETAIL ARCHITECTURE defines the architecture of the TAP TSI, whereas the technical document B.61 – GOVERNANCE describes the interaction between the TAP TSI stakeholders. The technical document B.62 – MASTER PLAN defined the milestones for the implementation of the regulatory functions of the TAP TSI.

Due the experience gathered by the rail sector during the implementation of the TAP TSI services governance association (TSGA) the governance and the IT-solutions implemented have been changed slightly. For instance the technical service groups, proposed by the technical document B.61, are not needed and were not implemented therefore. Those changes have to be reflected in the documents.

5.4.1.   Revision of technical documents B.60 and B.61

Due the experience gathered by the rail sector during the implementation of the TAP TSI services governance association (TSGA) the governance and the IT-solutions implemented have been changed slightly. For instance the technical service groups, proposed by the technical document B.61, are not needed and were not implemented therefore. Those changes have to be reflected in the documents.

ERA has presented the ingoing position in the 7th meeting of the TAP TSI working party:

Table 8: revision of the technical documents B.60 and B.61

Document	Proposed measures
TAP TSI ANNEX B.60 TAP Architecture	- Incorporation of the requirements concerning the data exchange for the IoA (excluded to be discussed in CR 11) - Review of the document
TAP TSI Annex B.61 TAP Governance	- Incorporation of the changed governance of the TAP TSI - Review of the document

The documents have been reviewed with the rail sector representatives of CER and TSGA to take into account their comments for the revised governance. The meetings took place on 16 May and 9 July 2019. The revised documents have been presented in the 9th meeting of the working party.

The changed documents were accepted by the working party.

5.4.2.   Withdrawal of the technical document B.62 - Master plan

ERA presented in the 7th meeting of the working party the ingoing position regarding the changes on the TAP TSI master plan.

Table 9: Revision of the technical document B.62 – Master plan

Document	Proposed measures
TAP TSI Annex B.62 TAP Master plan	- Review of the document - Review of outdated milestones

During the preparatory meeting with TSGA and CER it has been discovered, that it the document is outdated at all and the continuation of maintenance for this document would not be useful. Most of the functions are implemented and some chapters of the document, e.g. budget, are not anymore valid.

ERA presented therefore the proposal to withdraw this document in the 9th meeting of the working party.

Concerning the TAP TSI technical document B.62 (Master plan) it has been decided to withdraw this document. The reason for this is that the document is referred to the TAP Masterplan which is now outdated and the functions of the TAP TSI architecture will be provided by TSGA soon, and to the TSGA budget (not appropriate to mention financial figures on a Technical Document). The group accepted the proposal.

5.5.   Revision of chapter 6 – Interoperable constituents

The revision of chapter 6 was requested by the COMMISSION DELEGATED DECISION (EU) 2017/1474 [4] where it is requested in article 13(7): The TAP TSI shall allow the Agency to assess the compliance of the IT tools deployed by the European rail sector with the TSI requirements.

For this purpose ERA has presented to the 9th working party meeting a proposal to introduce a new chapter "6.2.1. Assessment of compliance of IT tools" in the TAP TSI, allowing ERA to check the compliance of the tool on request of the European rail sector. The TAF TSI revision working party already agreed to such a provision for the TAF TSI.

The 9th working party discussed the proposal. The main discussion point was the timeframe for the completeness check of the submitted documents and the provision of the compliance report by ERA. The working party agreed, that ERA shall provide for the next meeting a harmonised proposal with the TAF TSI.

ERA proposed for the 10th meeting modified proposal taking into account the decisions in the TAF TSI revision working party, e.g. concerning the timeframe to for ERA to publish the report. The proposed document has been accepted by the working party.

5.6.   Revision of chapter 7 – Implementation

The chapter 7 – the implementation of the TAP TSI – was initially not in the scope of the TAP TSI revision working party. During the elaboration of the recommendation of the revised TAP TSI it has been recognised, that a revision of the chapter 7 would be necessary to reflect the changes in the technical documents B.61 – TAP TSI governance. The chapter 7 has been revised significantly during the TAP TSI phase 1 and provided several statements concerning the TAP TSI implementation, such as the drafting of the applicant guides in the TAP TS phase 1, not reflecting anymore the development of the TAP TSI. Those outdated requirements had to be modified.

ERA proposed for the 9th meeting of the working party a document with the changes envisaged for the chapter 7. A 2nd proposal has been submitted by CER. This proposal proposed a governance based on TSGA including the maintenance of the TAP TSI technical document B.61 (governance). ERA reminded that such a proposal has no legal basis, that external organisations may modify legislative documents and has to be withdrawn. Further changes, such as for the deployment monitoring process were accepted. The working party agreed to compile a new proposal based on the two documents submitted by CER and ERA, based on the following decisions in the 9th meeting of the working party:

› Include Masterplan activities in the deployment monitoring process
› The technical documents B.60, B.61 are part of the TAP TSI, but will not be subject to the change control management

This document has been compiled by ERA, published on the working space for the revision working party and presented in the 10th meeting of working party. The proposed document has been accepted by the working party.

6.   Public consultation

According to the internal procedures for the drafting of recommendations, a social consultation had to be performed to inform the passenger organisations and the freight customers about the results of the revision of the TAP TSI. For this purpose a dedicated website[5] including a functional mailbox[6] has been made available by ERA, where the drafted TAP TSI version from 15 July 2019, containing all agreed changes until this date, has been made available to the public.

The consultation has been published on 19 July 2019 on the website of the agency. The passenger organisations and freight customers have been asked to provide their opinion concerning the revised TAP TSI to ERA. Due to the summer holidays the information email about the public consultation to the passenger organisations and freight customer organisations has been sent on 7 September 2019. Due to this delay the deadline for the public consultation has been extended until 15 November 2019.

ERA has received until 15 November 2019 feedback from the following organisations:

›   European cyclists federation (ECF)
›   European passenger federation (EPF)
›   ROVER (Dutch passenger federation)

Furthermore ERA has received during the consultation input from the following organisations, which were not addressed directly by the social consultation:

›   CER
›   UNIFE
›   VR Group
›   Sweden

ERA took them into account, because most of them are members of the TAP SI revision working party.

The full list of the received comments is available on the website for the consultation.

The comments received have been presented in the 10th meeting of the working party. ERA presented the comments to be taken into account by the working party:

›   For basic parameter 4.2.11.1 the phrase "Ticket only or ticket and reservation for" has been taken into account for the "special fares in conjunction with national railcards" and "group tickets"
›   For the basic parameter 4.2.23 – Connections with other modes of transport the allowed standards have been aligned with the regulation (EU) 1926/2017 *"and subsequent versions; or any machine-readable format fully compatible and interoperable with those standards or technical documents."*
›   The basic parameter 4.2.7.1. – conditions of carriage *"the train types/numbers"* has been extended by *"including – if available – the types and number of bikes permitted"*

Further comments from the social consultation have not been taken into account. The justifications for these decisions are available in the annexed document [5].

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[5] https://www.era.europa.eu/content/consultation-revision-tsi-relating-telematics-applications-passengers-tap-tsi_en

[6] ERA-REC-122@era.europa.eu

7. Impact assessment

The approach for the impact assessment of the TAP TSI revision has been presented in the 6th meeting of the TAP TSI revision working party. the impact assessment is focusing on new TAP TSI basic parameters proposed in the recommendation.

For the impact assessment the following classification of the change requests has been prepared:

› Error correction – no impact assessment needed: in this case the change request corrected an error
› Impact negligible: only minor changes in the TAP TSI core text with negligible economic impact.
› Impact assessment covered by another TSI: The impact assessment has been already executed for another TSI
› Impact assessment: An impact assessment has been executed for the change request.

The changes were classified according to the rules, as listed in the table below.

Table 10: Classification of change requests for the impact assessment

id	Headline	Impact assessment necessary
CR 04	Storage of TrainRunningInformation-message	Impact negligible
CR 06	Fulfilment as ticket on departure or manifest on list	Impact assessment: The setup of the public-key-infrastructure was subject to an impact assessment.
CR 07	Alignment of TAP RU/IM related BPs with TAF	Error correction – no impact assessment needed.
CR 08	Handling of innovative solutions	Error correction – no impact assessment needed.
CR 09	Handling of IT related BPs 4.2.18 to 4.2.21	Error correction – no impact assessment needed.
CR 10	Clarification of the role of the station manager	Error correction – no impact assessment needed.
CR 11	Incorporation of the requirements from the revised PRM TSI	An impact assessment has been already presented for the revision of the PRM TSI. There is no additional effort for the TAP TSI.
CR 12	Ensure the exchange of fare information in the context of other modes of transport	Impact assessment: The impact assessment is covered by the impact assessment for the CR 17 – Exchange of tariff data – domestic fares. The light impact assessment is available
CR 16	TAP TSI adaptation to "DIRECTIVE (EU) 2016/797 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the interoperability of the rail system within the European Union"	Error correction – no impact assessment needed.
CR 17	Exchange of tariff data - domestic tariffs	Impact assessment: This change was subject to an impact assessment. The light impact assessment is available
CR 20	Modification of the geographical scope of the TAP TSI	Error correction – no impact assessment needed.
CR 26	Update of the TAP TSI chapter 7 (Implementation)	Error correction – no impact assessment needed.
CR 13	Ensure an updated reference to the relevant standards	Error correction – no impact assessment needed.
CR 14	Closing of the open point "4.2.11.4 Technical document or standard on indirect fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales"	The setup of the public-key- infrastructure was subject to an impact assessment.

CR 15	Closing of the open point "4.2.10 Standard for the handling of security elements for product distribution" - fulfilment as mobile ticket	The setup of the public-key- infrastructure was subject to an impact assessment. The light impact assessment is available
CR 21	Closing of the open point "4.2.11.3 - Technical document or standard on direct fulfilment methods which are linked to the ticket and/or reservation and to the kind of media for domestic sales" - fulfilment of domestic tickets	The basic parameter proposes the voluntarily usage of the TAP TSI technical documents for ticketing. Impact negligible
CR 22	Change of the Annex V of the TAP TSI (Governance, Architecture, Master plan)	Impact negligible
CR 25	Description of the conformity assessment of TAP TSI	Impact negligible
CR 28	Change of the glossary for harmonisation with the revised TAF TSI	Error correction – no impact assessment needed.
CR 29	Incorporation of comments from the social consultation	Impact negligible

The impact assessment for the revision of the TAP TSI has been focused on the following two change requests in order to assess potential options for solutions and to identify the best option:

› CR 17 Exchange of tariff data - domestic tariffs
› CR 15 Closing of the open point "4.2.10 Standard for the handling of security elements for product distribution" - fulfilment as mobile ticket

The documents are available as separate annex [3], [4].

8. Next steps

As explained in the report the update of the application guides for the TAP TSI is still missing. Therefore the following steps have to be done in 2020 for the finalisation of the TAP TSI revision.

1. Update of the TAP TSI application guides for timetable data exchange, reservation, ticketing
2. Update of the TAP TSI application guide for tariff data, including the guidelines for the publication of the domestic tariffs for rail
3. Creation of the application guide concerning the publication of the accessibility data for the stations

ERA will address these topics in the work programme for the "Evolution of telematics application for passengers" for the year 2020.

9. Annex 1: Definitions and abbreviations

9.1. Definitions

Table 11: Table of definitions

Definition	Description
Agency	The European Railway Agency (ERA) such as established by the Regulation (EU) 2016/796 repealing (EC) No 881/2004 of the European Parliament and of the Council of 29 April 2004.

9.2. Abbreviations and acronyms

Table 12: Table of abbreviations

Abbreviation	Description
CCM	Change control management
CER	Community of European Railway and Infrastructure Companies
CIT	International rail transport committee
CR	Change Request
CRD	Central Reference Database
EC	European Commission
EIM	European Rail Infrastructure Managers
EPF	European passenger federation
ERA	European Agency for Railways (also referred to as Agency)
eu travel tech	European Technology and Travel Services Association (formerly known as ETTSA)
IA	Impact assessment
IM	Infrastructure Manager
IoA	PRM TSI Inventory of assets
RI	Railway indicator
RISC	Rail Interoperability and Safety Committee
RNE	Rail Net Europe
RU	Railway Undertaking
SM	Station manager
SO	Strategic objective
TAF	Telematics Applications for Freight
TAP	Telematics Applications for Passengers

Abbreviation	Description
TEN	Trans European Network
ToR	Terms of Reference
TSGA	TAP TSI Governance association
TSI	Technical Specification for Interoperability
UIC	Union Internationale des Chemins de fer
UIP	International Union of Wagon Keepers
UNIFE	Association of the European Rail Industry
WK	Wagon Keepers
WP	Working Party organised by ERA

10.   Annex 2: Reference documents

Table 13 : Table of reference documents

N°	Title	Reference	Version
[1]	Subsystem telematics applications for passengers – report about the closing of open points	ERA/REP/03-2012/INT	30/03/2012
[2]	Tariff data exchange for domestic rail tariffs	ERA-2017-3-NP	27/09/2018
[3]	Light Impact Assessment TAP Revision 2019/20 – Closure of Open Point related to tariff data for domestic sales in TAP TSI	ERA-REC-122-IA-DT	01/06/2019
[4]	Light Impact Assessment TAP Revision 2019/20 – Closure of Open Point Chapter 4.2.10 related to Public Key Infrastructure	ERA-REC-122-IA-PKI	23/09/2019
[5]	Received comment sheets consolidated.xls		11/12/2019
[6]	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on rail passengers' rights and obligations	2017/0237 (COD)	27/09/2017

11. Annex 3: Reference legislation

Table 14 : Table of reference legislation

N°	Title	Reference	Version
[1]	Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system (Recast)	OJ L 138, 26.5.2016, p. 44.	N.A.
[2]	Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) No 881/2004	OJ L 138, 26.5.2016, p. 1.	N.A.
[3]	Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (Recast)	OJ L 138, 26.5.2016, p.102.	N.A.
[4]	COMMISSION DELEGATED DECISION (EU) 2017/1474 of 8 June 2017 supplementing Directive (EU) 2016/797 of the European Parliament and of the Council with regard to specific objectives for the drafting, adoption and review of technical specifications for interoperability	OJ L 210/5, 15.8.2017.	N.A.
[5]	COMMISSION REGULATION (EU) No 454/2011 of 5 May 2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system	OJ L 123, 12.5.2011, p. 11–67	N.A.
[6]	COMMISSION REGULATION (EU) No 1273/2013 of 6 December 2013 amending Regulation (EU) No 454/2011 on the technical specification for interoperability relating to the subsystem 'telematics applications for passenger services' of the trans-European rail system	OJ L 328, 7.12.2013, p. 72–78	N.A.