COMMISSION IMPLEMENTING REGULATION (EU) 2021/541

of 26 March 2021

amending Regulation (EU) No 1305/2014 as regard the simplification and improvement of data calculation and exchange and the update of the Change Control Management process

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union ([1]), and in particular Article 5(11) thereof,

Whereas:

(1) Article 19 of Regulation (EU) 2016/796 of the European Parliament and of the Council ([2]) requires the European Union Agency for Railways (the 'Agency') to address recommendations to the Commission on the technical specifications for interoperability ('TSIs') and their revision, in accordance with Article 5 of Directive (EU) 2016/797, and to ensure that TSIs are adapted to technical progress, market trends and social requirements.

(2) According to Article 13 of Commission Delegated Decision (EU) 2017/1474 ([3]), Commission Regulation (EU) No 1305/2014 ([4]) ('TAF TSI') has to be revised in order, inter alia, to simplify the procedure for the update of its technical baseline in accordance with the TAF TSI Change Control Management ('CCM') process and to develop, revised or simplify the content and structure of messages defined in the TAF-TSI in relation to exchange of information with other systems or operators.

(3) To this end, on 9 September 2020, the Agency addressed a recommendation to the Commission in order to introduce in the TAF-TSI new or modified specifications related to methodologies and information flows concerning the Expected Time of Arrival, tracking data for customers and exchange of data with other systems, and to adjust the CCM process.

(4) Regulation (EU) No 1305/2014 should be amended accordingly.

(5) The measures provided for in this Regulation are in accordance with the opinion of the Committee established in accordance with Article 51(1) of Directive (EU) 2016/797,

HAS ADOPTED THIS REGULATION:

Article 1

The Annex to Regulation (EU) No 1305/2014 is replaced by the text in the Annex to this Regulation.

([1]) OJ L 138, 26.5.2016, p. 44.

([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).

([3]) 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, 15.8.2017, p. 5).

([4]) Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the rail system in the European Union and repealing the Regulation (EC) No 62/2006 (OJ L 356, 12.12.2014, p. 438).

Article 2

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 26 March 2021.

For the Commission
The President
Ursula VON DER LEYEN

ANNEX

TABLE OF CONTENTS

1. INTRODUCTION 23
1.1. Abbreviations 23
1.2. Reference Documents 23
1.3. Technical scope 24
1.4. Geographical Scope 24
2. DEFINITION OF SUBSYSTEM AND SCOPE 24
2.1. Function within the scope of the TSI 24
2.2. Functions outside the scope of the TSI 25
2.3. Overview of the subsystem description 25
2.3.1. Considered Processes 25
3. ESSENTIAL REQUIREMENTS 26
3.1. Compliance with the essential requirements 26
3.2. Essential requirements aspects 26
3.3. Aspects relating to general requirements 26
3.3.1. Safety 26
3.3.2. Reliability and availability 26
3.3.3. Health 26
3.3.4. Environmental protection 26
3.3.5. Technical compatibility 27
3.3.6. Accessibility 27
4. CHARACTERISATION OF THE SUBSYSTEM 27
4.1. Introduction 27
4.2. Functional and technical specifications of the subsystem 27
4.2.1. Consignment Note data 28
4.2.2. Path Request and path allocation 28
4.2.3. Train Preparation 30
4.2.4. Train Running Information and Train Running Forecast 31
4.2.5. Service Disruption Information 32
4.2.6. Shipment ETI/ETA 32
4.2.7. Wagon Movement 34
4.2.8. Data Exchange for Quality Improvement 35
4.2.9. The Main Reference Data 35
4.2.10. Various Reference Files and Databases 36
4.2.11. Networking & Communication 37

4.3. Functional and technical specifications of the interfaces 39
4.3.1. Interfaces with the TSI Infrastructure 39
4.3.2. Interfaces with the TSI Control/Command and Signalling 39
4.3.3. Interfaces with the rolling stock subsystem 40
4.3.4. Interfaces with the TSI operation and traffic management 40
4.3.5. Interfaces with the Telematics Applications for Passenger Services 40
4.4. Operating rules 40
4.4.1. Data quality 41
4.4.2. Operating the central repository 42
4.5. Maintenance rules 42
4.6. Professional qualifications 42
4.7. Health and safety conditions 42
5. INTEROPERABILITY CONSTITUENTS 43
5.1. Definition 43
5.2. List of Constituents 43
5.3. Constituents' Performances and Specifications 43
6. ASSESSMENT OF CONFORMITY AND/OR SUITABILITY FOR USE OF THE CONSTITUENTS AND VERIFICATION OF THE SUBSYSTEM 43
6.1. Interoperability Constituents 43
6.1.1. Assessment Procedures 43
6.1.2. Module 43
6.2. Subsystem Telematics Applications for Freight 43
6.2.1. Assessment of compliance of IT tools 43
7. IMPLEMENTATION 44
7.1. Introduction 44
7.2. Change Management 45
7.2.1. Change Management Process 45
7.2.2. Specific Change Management Process for documents listed in Appendix I to this Regulation 45
Appendix I – List of technical documents 47
Appendix II – Glossary 48
Appendix III – Tasks to be undertaken by the TAF/TAP National Contact Point (NCP) 56

1. INTRODUCTION

1.1. Abbreviations

Table 1

Abbreviations

Abbreviation	Definition
CI	Common Interface
EC	European Commission
ERA	European Union Agency for Railways (also referred to as Agency)
IM	Infrastructure Manager
ISO	International Organisation for Standardisation
LCL	Less than Container Loads
LRU	Lead Railway Undertaking
RISC	Rail Interoperability and Safety Committee
RU	Railway Undertaking
TAF	Telematics Applications for Freight
TAP	Telematics Applications for Passengers
TCP/IP	Transmission Control Protocol/Internet Protocol
TSI	Technical Specification for Interoperability
WK	Wagon Keepers

1.2. Reference Documents

Table 2

Reference documents

Ref. No	Document Reference	Title	Last Issue
(1)	Directive (EU) 2016/797	Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union (OJ L 138, 26.5.2016, p. 44).	27.5.2020
(2)	TAP TSI Regulation (EU) No 454/2011	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).	27.5.2019
(3)	Directive 2012/34/EU	Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (OJ L 343, 14.12.2012, p. 32).	14.11.2017
(4)	ERA-TD-105	TAF TSI – ANNEX D.2: APPENDIX F – TAF TSI DATA AND MESSAGE MODEL.	

(5)	TAF TSI Regulation No 62/2006	Commission Regulation (EC) No 62/2006 of 23 December 2005 on the technical specification for interoperability relating to the telematics applications for freight subsystem of the trans-European conventional rail system (OJ L 13, 18.1.2006, p. 1).	18.1.2006
(6)	C(2010)2576 final	Commission Decision of 29 April 2010 concerning a mandate to the European Railway Agency to develop and review Technical Specifications for Interoperability with a view to extending their scope to the whole rail system in the European Union.	29.4.2010
(7)	Directive (EU) 2016/798	Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety (OJ L 138, 26.5.2016, p. 102).	26.5.2016
(8)	Commission Delegated Decision (EU) 2017/1474	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, 15.8.2017, p. 5).	15.8.2017

1.3. Technical scope

This Technical Specification for Interoperability (hereinafter referred to as the TAF TSI) concerns the element 'applications for freight services' of the subsystem 'telematics applications' included in the functional area of the list in Annex II to Directive (EU) 2016/797 and described in section 2.6(b) of that Annex.

The purpose of this TAF TSI is to ensure the efficient interchange of information by setting the technical framework, to achieve a transport process that is as economically viable as possible. It covers the applications for freight services and the management of connections with other modes of transport, which means that it concentrates on the transport services of an RU in addition to the pure operation of trains. Safety aspects are only considered as far as the existence of data elements; values will have no impact on the safe operation of a train and compliance with TAF TSI requirements cannot be regarded as compliance with safety requirements.

TAF TSI also has an impact on the conditions of use of rail transport by users. In this respect the term users means not only infrastructure managers or railway undertakings but also all other service providers such as wagon companies, intermodal operators and even customers.

1.4. Geographical Scope

The TSI shall apply to the Union's network as defined in Annex I, Section 1 of Directive (EU) 2016/797.

2. DEFINITION OF SUBSYSTEM AND SCOPE

2.1. Function within the scope of the TSI

The subsystem Telematics Applications for Freight is defined in Annex II of the Directive (EU) 2016/797, Section 2.6(b).

It includes in particular:

— applications for freight services, including information systems (real-time monitoring of freight and trains),

— marshalling and allocation systems, whereby under allocation systems is understood train composition,

— reservation systems, whereby here is understood the train path reservation,

— management of connections with other modes of transport and production of electronic accompanying documents.

2.2. Functions outside the scope of the TSI

Payment and invoicing systems for customers are not within the scope of this TSI, nor are such systems for payment and invoicing between various service providers such as railway undertakings or infrastructure managers. The system design behind the data exchange in accordance with Chapter 4.2 (Functional and technical specifications of the subsystem), however, provides the information needed as a basis for payment resulting from the transport services.

The long term planning of the timetables is outside the scope of this Telematics Applications TSI. Nevertheless, at some points there will be reference to the outcome of the long term planning in so far as there is a relationship with the efficient interchange of information required for the operation of trains.

2.3. Overview of the subsystem description

2.3.1. *Considered Processes*

When taking into account the needs of a Customer, one of the services is to organise and manage the transport line in accordance with the contract between the Lead Railway Undertaking (LRU) and the Customer.

The LRU is the single point of contact for the Customer. If more than one Railway Undertaking is involved in the transport chain, the LRU is also responsible for the coordination with the other RUs. This service can also be undertaken by a forwarder or by any other entity.

This TSI for the railway freight transport industry is limited in accordance with Directive (EU) 2016/797 to IMs and RUs/LRUs data exchange. This TSI enables the LRU to provide information to the Customer in particular:

— Path information.

— Train Running Information on agreed reporting points, including at least departure, interchange/handover and arrival points of the contracted transport.

— Estimated Time of Arrival (ETA) to the final destination including yards and intermodal terminals.

— Service Disruption. When the Lead RU learns about a service disruption, it shall deliver to the Customer in due time.

For the delivery of this information, the respective TAF compliant messages are defined in Chapter 4.

The RUs/LRUs must in general have, at minimum, the capability of:

— DEFINING: services in terms of price and transit times, wagon supply (where applicable), wagon/Intermodal unit information (location, status and the wagon/Intermodal unit related estimated time of arrival 'ETA'), where shipments can be loaded on empty wagons, containers etc.,

— DELIVERING: the service that has been defined in a reliable, seamless manner through the use of common business processes and linked systems. There must be a capability for RUs, IMs and other service providers and stakeholders such as customs to exchange information electronically,

— MEASURING: the quality of the service delivered compared to what was defined. i.e. billing accuracy against price quoted, actual transit times against commitments, wagon supplied against order, ETAs against actual arrival times,

— OPERATING: in a productive manner in terms of utilisation: train, infrastructure and fleet capacity through the use of business processes, systems and data exchange required to support wagon/Intermodal unit and train scheduling.

The handling of empty wagons takes on particular relevance when considering interoperable wagons. In principle, there is no difference in the handling of loaded or empty wagons. The transport of empty wagons is also based on consignment orders, whereby the fleet manager for these empty wagons must be considered as a customer.

3. ESSENTIAL REQUIREMENTS

3.1. Compliance with the essential requirements

In accordance with the Directive (EU) 2016/797, the Union Rail System, subsystems and their interoperability constituents must meet the essential requirements set out in general terms in Annex III of that Directive.

In the scope of the present TSI, the fulfilment of relevant essential requirements listed in Chapter 3 will be ensured for the subsystem by the compliance with the specifications described in Chapter 4 (Characterisation of the subsystem).

3.2. Essential requirements aspects

The essential requirements concern:

— Safety,

— Reliability and Availability,

— Health,

— Environmental protection,

— Technical compatibility.

— Accessibility.

According to Directive (EU) 2016/797, the essential requirements may be generally applicable to the whole Trans-European Rail System or be specific to each subsystem and its constituents.

3.3. Aspects relating to general requirements

The relevance of the general requirements to the Telematics Applications Subsystem for Freight is determined as follows:

3.3.1. *Safety*

The essential requirements 1.1.1, 1.1.2, 1.1.3, 1.1.4 and 1.1.5 of Annex III to Directive (EU) 2016/797 are not relevant to the Telematics Applications subsystem.

3.3.2. *Reliability and availability*

'The monitoring and maintenance of fixed or movable components that are involved in train movements must be organised, carried out and quantified in such a manner as to maintain their operation under the intended conditions.'

This essential requirement is met by the following Chapters:

— Chapter 4.2.9: The Main Reference Data,

— Chapter 4.2.10: Various Reference Files and databases,

— Chapter 4.2.11: Networking & Communication.

3.3.3. *Health*

The essential requirements 1.3.1 and 1.3.2 of Annex III to Directive (EU) 2016/797 are not relevant to the Telematics Applications subsystem.

3.3.4. *Environmental protection*

The essential requirements 1.4.1, 1.4.2, 1.4.3, 1.4.4 and 1.4.5 of Annex III to Directive (EU) 2016/797 are not relevant to the Telematics Applications subsystem.

3.3.5. *Technical compatibility*

The essential requirement 1.5 of Annex III to Directive (EU) 2016/797 is not relevant to the Telematics Applications subsystem.

3.3.6. *Accessibility*

The essential requirement 1.6 of Annex III to Directive 2016/797 is not relevant to the Telematics Applications subsystem.

4. CHARACTERISATION OF THE SUBSYSTEM

4.1. Introduction

The rail system, to which Directive (EU) 2016/797 applies and of which the Telematics Applications Subsystem is a part, is an integrated system whose consistency must be verified. This consistency must be checked in particular with regard to the specifications of the subsystem, its interfaces vis-à-vis the system in which it is integrated, as well as the operating and maintenance rules.

Taking into account all the applicable essential requirements, the Telematics Application Subsystem for Freight is characterised by:

4.2. Functional and technical specifications of the subsystem

In light of the essential requirements in Chapter 3, the functional and technical specifications of the subsystem cover the following parameters:

— Consignment Note data,

— Path Request and Path Allocation,

— Train Preparation,

— Train Running Information and Train Running Forecast,

— Service Disruption Information,

— Wagon/Intermodal unit ETI/ETA,

— Wagon Movement,

— Data Exchange for Quality Improvement,

— The Main Reference Data,

— Various Reference Files and Databases,

— Networking & Communication.

In addition to the provisions from the Chapter 4 and its sub-chapters every stakeholder may exchange the messages according to Chapters 4.2.2.3 (only during operation or preparation of train operation), 4.2.4.2, 4.2.4.3, 4.2.5.2, 4.2.6.3 and 4.2.6.4 with other stakeholders involved in the same freight service, under the condition that the stakeholders are identifiable. These exchanges of messages may be charged by the sender.

The LRU is responsible for the information to the Customers according to the contractual agreement.

The detailed data specifications are defined in the complete Data Catalogue. The mandatory formats of the messages and the data of this Catalogue are defined in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I. In addition, other existing standards may be used for the same purpose if there is a specific agreement between the parties involved to allow the use of these standards in particular for combined/intermodal transport or on the territories of EU Member States having a border with third countries.

General remarks on the message structure

The messages are structured into two data sets:

— Control data: defined through the mandatory message header of the messages of the catalogue.

— Information data: defined by the mandatory/optional content of each message and mandatory/optional data set in the catalogue.

If a message or a data element is defined as optional in this Regulation, the involved parties decide on using it. The application of these messages and data elements must be part of a contractual agreement. If in the data catalogue optional elements are mandatory under certain conditions this has to be specified in the data catalogue.

4.2.1. *Consignment Note data*

4.2.1.1. Customer Consignment Note

The Customer shall send the Consignment Note to the Lead RU. It must show all the information needed to carry a consignment from the consignor to the consignee according to 'Uniform Rules Concerning the Contract of International Carriage of Goods by Rail (CIM)' and 'Uniform Rules concerning Contracts of Use of Vehicles in International Rail Traffic (CUV)'. The LRU must supplement additional information. A subset of the consignment note data including the additional ones, are described in Appendix I, TAF TSI – ANNEX D.2: APPENDIX A (WAGON/ILU TRIP PLANNING) and Appendix I, TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model (4))) listed in the table in Appendix I of this Regulation.

In the case of Open Access the Lead RU contracting with the customer has all the information after the supplement of the data available. No message exchange is needed with other RUs. These data are also the basis for a path request on short notice, if this is required for the execution of the consignment note.

The following messages are for the case of non-Open Access. The content of these messages may also be the basis for the path requests on short notice, if required for the execution of the consignment note.

4.2.1.2. Consignment orders

The consignment order is primarily a subset of the Consignment Note information. It must be forwarded to the RUs involved in the transport chain by the LRUs. The content of the Consignment order must show the relevant information which is needed for an RU to effect transportation during its responsibility until handover to next RU.

The mandatory data structure of the consignment order and detailed formats of this message are listed in the 'Consignment Order Message' in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I

The main contents of these consignment orders are:

— Consignor and consignee information,

— Routing information,

— Consignment identification,

— Wagon information,

— Place and time information.

4.2.2. *Path Request and path allocation*

4.2.2.1. Preliminary remarks

The Path defines the requested, accepted and actual data to be stored concerning the path and the characteristics of the train for each segment of that path. The following description presents the information, which must be available to the infrastructure manager and/or the allocation body (AB).. This information must be updated whenever a change occurs. The information of the annual path therefore needs to allow the retrieval of the data for short-term amendments. In particular, the Customer, in case he is impacted, must be informed by LRU.

Path Request on short notice

Due to exceptions during the train running or due to transport demands on a short time basis, a railway undertaking or an Applicant must have the possibility to get an ad hoc path on the network.

The RU/Applicant acting in the role of the Responsible Applicant must provide the infrastructure manager with all necessary data concerning when and where the train is required to run together with the physical characteristics in so far as they interact with the infrastructure. These requirements are valid for all Short Notice Path Requests and related messages. No minimum timeframe is specified for it at European level. The network statement may specify minimum timeframes.

Path Request on short notice does not include Traffic Management issues. The time limit between Short Term paths and Traffic Management path changes is subject to Local Agreements and may be indicated in the network statement..

Requirements considering the responsibilities of a RU/Applicant/IM during the path request and allocation processes are not part of this regulation. Relevant information is given within the Commission Implementing Regulation (EU) 2019/773 ([1]) (OPE TSI).

4.2.2.2. Path Request message

The RU/Applicant assuming the role of Responsible Applicant shall send the 'Path Request message' to the infrastructure manager (IM)/Allocation Body (AB) to request a path.

The definition of the mandatory structure of the 'Path Request message' and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.2.3. Path Details message

The IM/AB acting as Planning IM shall send the 'Path Details message' to the requesting RU/Applicant in response to its Path Request.

The definition of the mandatory structure of Path Details message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.2.4. Path Confirmed message

The requesting RU/Applicant assuming the role of Responsible Applicant shall send the 'Path Confirmed message' to confirm the Path proposed by the IM/AB.

The definition of the mandatory structure of Path Confirmed message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.2.5. Path Details Refused message

The requesting RU/Applicant assuming the role of Responsible Applicant shall send the 'Path Details Refused message' to the relevant IM/AB to reject its proposed Path Details.

The definition of the mandatory structure of Path Details Refused message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.2.6. Path Cancelled message

The RU/Applicant assuming the role of Responsible Applicant (in planning phase) or assuming the role of Responsible RU (in operation) shall send the 'Path Cancelled message' to the relevant IM/AB to cancel all or part of a Path that has been confirmed.

The definition of the mandatory structure of Path Cancelled message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

([1]) Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 on the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system within the European Union and repealing Decision 2012/757/EU (OJ L 139 I, 27.5.2019, p. 5).

4.2.2.7. Path Not Available message

The IM/AB assuming the role Planning IM (in planning phase) or in the role Responsible IM (in operation) shall send the 'Path Not Available message' to the contracted RU/Applicant in the event that the Path confirmed by the RU/Applicant is no longer available.

The IM must inform the RU as soon as it has the knowledge that a train path is not available. The 'Path Not Available message' can be send at any time between the moment the train path is contracted and the departure of the train. A cause of this message may be e.g. an interruption on the path.

'Path Not Available message' means that the path or a part of the path cannot be used and no longer exists.

If an alternative path is available, together with this message or as soon as that path is known, the IM must send without any further request from the RU an alternative proposal. This is done with the 'Path Details message' related to this 'Path Not Available message'. If an alternative proposal is not possible, the IM must inform the RU immediately.

The definition of the mandatory structure of Path Not Available message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.2.8. Receipt Confirmation message

The recipient of each message shall send the 'Receipt Confirmation message' to the originator of the related message in order to acknowledge that its legacy system has received the message.

The definition of the mandatory structure of Receipt Confirmation message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.3. *Train Preparation*

4.2.3.1. General Remarks

This basic parameter describes the messages, which must be exchanged during the train preparation phase until the start of the train.

Train preparation includes compatibility check between the train and the route. This check is done by the RU on basis of information provided by concerned IMs on infrastructure description and infrastructure restrictions.

In case the train is taken over as a whole by the next RU, the Responsible RU shall send the Train Composition to the next Responsible RU. According to contractual agreements this message must also be sent from the Responsible RU to the IM(s). This applies as well, if the path has been booked by another Responsible Applicant, who has mandated the Responsible RU with the train run. Furthermore, the Responsible RU remains the partner for the message exchange with the IM, if it subcontracts the run of the train to another RU.

If the train composition is changed at a location, this message must be exchanged once more with information updated by the Responsible RU.

4.2.3.2. Train Composition message

The Responsible RU shall send the 'Train Composition message' defining the composition of the train to the next Responsible RU involved in the freight service and to the Lead RU. According to network statement, the 'Train Composition message' is also to be sent from the Responsible RU to the IM(s).

The definition of the mandatory structure of Train Composition message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

Minimum elements to be delivered for the message exchange between RU and IM for the purpose Train Composition are defined in Chapter 4.2.2.7.2 of Implementing Regulation (EU) 2019/773 (OPE TSI).

4.2.3.3. Train Ready message

The Responsible RU shall send a 'train ready' message to the infrastructure manager every time a train is ready to start after train preparation, unless under national rules the infrastructure manager accepts the timetable as a 'train ready' message.

In the case of combined transport, the Terminal Operator shall send a 'train ready' message to the RU every time a wagon set is ready to start. The RU providing traction to the IM entry point shall send the 'train ready' message to the RU operating the train service on the IM network.

The definition of the mandatory structure of Train Ready message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.4. *Train Running Information and Train Running Forecast*

4.2.4.1. General Remarks

This basic parameter lays down the train running information and train running forecast. It must prescribe how the dialogue between infrastructure manager and railway undertaking are to be maintained in order to exchange train running information and train running forecasts.

This basic parameter lays down how the infrastructure manager must, at the appropriate time, send train running information to the railway undertaking and the subsequent neighbouring infrastructure manager involved in the operation of the train.

The train running information serves to provide details of the current status of the train at contractually agreed reporting points.

The train running forecast is used to provide information about the estimated time at contractually agreed forecast points. This message shall be sent from the infrastructure manager to the railway undertaking and the neighbouring infrastructure manager involved in the run.

Contractual agreements shall specify Reporting Points for the train's movement.

This information exchange between RUs and IMs always takes place between the IM in charge and the Responsible RU, who has responsibility for the run of the train. This applies as well, if the path has been booked by another Responsible Applicant, who has mandated the Responsible RU with the train run. Furthermore, the Responsible RU remains the partner for the message exchange with the IM, if it subcontracts the run of the train to another RU.

Under contractual agreement, the LRU will provide Customer the Train Running Forecast and Train Running Information. The reporting points will be agreed by both parties within the contract.

4.2.4.2. Train Running Forecast message

This message must be issued by the IM to the RU, who is running the train, for handover points, interchange points and for the train destination as described in Chapter 4.2.4.1.

In the case of combined transport under contractual agreement, the LRU/Responsible RU shall ensure the 'Train Running Forecast' message is provided to the Terminal Operator.

In addition, the message must be issued by the IM to the RU for other reporting points according the RU/IM contracts.

A train running forecast can also be sent before the train starts running. For additional delays occurring between two Reporting Points, a threshold has to be contractually defined between the railway undertaking and the infrastructure manager to which an initial or a new forecast has to be sent. If the extend of delay is not known, the infrastructure manager has to send a 'service disruption message' (see Chapter 4.2.5: Service disruption information).

The train running forecast message must give the forecast time for agreed forecast point.

The Infrastructure Manager shall send this message to the next neighbouring infrastructure manager involved in the train run.

The definition of the mandatory structure of Train Running Forecast message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.4.3. Train Running Information message and Train Delay Cause Message.

The 'Train Running Information message' must be issued by the IM to the Responsible RU upon:

— Departure from departure point, arrival at destination,

— Arrival and departure at handover points, interchange points and at agreed reporting points based on contract (e.g. handling points).

As soon as a cause of delay is known (first assumption), and in case of update on the cause of delay, it should be provided by the IM to the Responsible RU by the separate Train Delay Cause Message.

The definition of the mandatory structure of Train Running Information message and Train Delay Cause Message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.5. *Service Disruption Information*

4.2.5.1. General Remarks

This basic parameter lays down how service disruption information is handled between the railway undertaking and the infrastructure manager.

When the RU learns about a service disruption during the train running operation for which it is responsible, it must immediately inform the IM concerned (this may be done orally by the RU). If train running is interrupted, the infrastructure manager shall send 'a 'Train Running interruption" message to the contracted RU and the next neighbouring IM involved in the train run.

If the length of the delay is known, the infrastructure manager must send a train running forecast message instead

4.2.5.2. Train Running Interruption message

If the train is interrupted, the IM issues this message to the next neighbouring IM involved in the train run and to the Responsible RU.

In the case of combined transport under contractual agreement, the LRU/RU shall ensure the 'Train Running Interruption' message is provided to the Terminal Operator.

The definition of the mandatory structure of Train Running Interruption message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.6. *Shipment ETI/ETA*

4.2.6.1. Preliminary remarks

Chapter 4.2.2 (Path Request) has mainly described the communication between the RU and the IM. The individual monitoring of wagons or Intermodal units is not covered by this information exchange. This is done on the RU/LRU level based on the train related messages and is described in the following Chapters 4.2.6 (Shipment ETI/ETA) to 4.2.7 (Wagon Movement).

The wagon or Intermodal unit related information exchange and updating are essentially supported by storage of 'trip plans' and 'wagon movements' (Chapter 4.2.10.2: Other Databases).

For a customer the most important information is always the estimated time of arrival (ETA) for its shipment and for the train (TETA – Train Estimated Times of Arrivals). The wagon related ETA as well as the ETI is also the basic information in the communication between LRU and RU. This information is the main instrument for the LRU to monitor the physical transport of a shipment and to check it against the commitment to the customer.

The forecasted times in the train related messages are all related to an arrival of a train at a certain point, which may be a handover point, interchange point, the train destination or another reporting point. These are all Train Estimated Times of Arrivals (TETA).

Under contractual agreement, the LRU will provide Customer the estimated time of arrival (ETA) and estimated time of interchange (ETI) at shipment level and TETA at train level. The level of detail will be agreed by both parties within the contract.

For combined transport, the data messages containing the identifiers of the loading units (e.g. containers, swap-bodies, semi-trailers) will use either a BIC- or an ILU-Code according to ISO 6346 and EN 13044 respectively.

4.2.6.2. ETI/ETA calculation

The ETI/ETA calculation is based on the information from the infrastructure manager in charge, which sends, within the Train Running Forecast message, the Train Estimated Time of Arrival for defined reporting points (in any case for handover, interchange, or arrival points including Intermodal terminals) on the agreed train path e.g. for the handover point from one IM to the next IM (in this case TETA is equal to ETH).

For the interchange points or for other defined reporting points on the agreed train path, the RU must calculate for the next RU in the transport shipment chain, the estimated time of interchange (ETI) for the wagons and/or Intermodal units.

Remark on combined transport: For the Intermodal units on a wagon, the wagon ETIs are also ETIs for the Intermodal units. Regarding the ETAs for Intermodal units it should be noticed, that the RU is not in the position to calculate such an ETA or TETA beyond the public IM network. Therefore, the RU can only deliver ETIs related to the RU operating in the terminal that will provide an ETA or TETA to the Arrival Terminal Operator. Based on this ETA and TETA, the Terminal Operator will provide an ETP to the Combined Transport Operator, who will provide the final customer (such as freight forwarders, logistics service providers…) with the same ETP.

The Lead RU is responsible for the comparison of the ETA and TETA with the commitment to the customer.

Deviations of the ETA and TETA against the commitment to the customer must be handled in accordance with the contract and may lead to an alert management process by the LRU. For the transmission of information on the result of this process is foreseen the Alert message.

As a basis for the Alert management process, the LRU must have the possibility for a train or a wagon related enquiry on deviations. This enquiry of an LRU and the response from an RU is also specified below.

4.2.6.3. Wagon ETI/ETA message

The purpose of this message is to send ETI or updated ETI from one Responsible RU to the next in the transport chain.

All Responsible RUs in the transport chain of the wagons send the ETI/ETA or updated ETI/ETA to the LRU. Under contractual agreement based on the collected ETIs, the Lead RU shall calculate and provide an accurate ETA or TETA to its Customer and to the Terminal Operator

The definition of the mandatory structure of Wagon ETI/ETA message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.6.4. Alert message

Following the comparison between ETA and commitment to the customer, the LRU may send an Alert message to the RUs involved. The definition of the mandatory structure of Alert message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

Remark: In case of Open Access the calculation of ETI and ETA is an RU internal process. In this case the RU is the lead RU itself.

4.2.7. *Wagon Movement*

4.2.7.1. Preliminary Remarks

For the reporting of the movement of a wagon, data included in these messages must be stored and electronically accessible. They must be also exchanged within message on contractual base to authorised parties.

— Wagon Release notice

— Wagon Departure notice

— Wagon Yard arrival

— Wagon Yard departure

— Wagon Exceptions message

— Wagon Arrival notice

— Wagon Delivery notice

Under contractual agreement, the LRU must provide to the Customer the wagon movement information using the messages described below.

4.2.7.2. Wagon Release Notice message

The Lead RU is not necessarily the first RU in the transport chain. In this case the LRU must tell the RU in charge that the wagon is ready for pull at the customer sidings (Place of departure according to the LRU commitment) at the given release time (date and time of departure).

These events may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Release Notice message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.3. Wagon Departure Notice message

The RU must inform the LRU of the actual Date and Time that the wagon has been pulled from the place of departure.

These events may be stored in the Wagon and Intermodal Unit Operational Database. With this message exchange the responsibility for the wagon changes from customer to the RU. The definition of the mandatory structure of Wagon Departure Notice message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.4. Wagon Yard Arrival message

The RU must inform the LRU, that the wagon has arrived at its yard. This message can be based on a 'Train running information' message from Chapter 4.2.4 (Train Running Forecast). This event may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Yard Arrival message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.5. Wagon Yard Departure message

The RU must inform the LRU, that the wagon has left its yard. This message can be based on a 'Train running information' message from Chapter 4.2.4 (Train Running Forecast). This event may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Yard Departure message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.6. Wagon Exception message

The RU must inform the LRU if something unexpected occurs to the wagon, which might have an impact for the ETI/ETA, or requires any additional action. This message requires in most of the cases also a new ETI/ETA calculation. If the LRU decides to have a new ETI/ETA, it sends a message back to the RU, which has sent this message together with the indication 'ETI/ETA requested' (message: Wagon Exception message New ETI/ETA Request). The new ETI/ETA calculation must follow the procedure of Chapter 4.2.6 (Shipment ETI/ETA).

This information may be stored in the Wagon and Intermodal Unit Operational Database. The definition of the mandatory structure of Wagon Exception message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.7. Wagon Arrival Notice message

The last RU in a wagon or Intermodal unit transport chain must inform the LRU that the wagon has arrived at its yard (RU location). The definition of the mandatory structure of Wagon Arrival Notice message and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.7.8. Wagon Delivery notice message

The last RU in a wagon transport chain must inform the LRU that the wagon has been placed at the consignee's sidings.

Remark: In the case of Open Access the described wagon movement is a RU (LRU) internal process. Nevertheless all calculations and data storage must be executed by it as the LRU having a contract with and a commitment to the customer.

The sequence diagram for these messages based on example 1 for the ETI calculation for the wagons 1 and 2 (see Chapter 4.2.6.2: ETI/ETA calculation) is integrated in the diagram for interchange reporting in the document 'TAF TSI – Annex A.5:Figures and Sequence Diagrams of the TAF TSI messages' Chapter 6, listed in Appendix I.

4.2.8. *Data Exchange for Quality Improvement*

To be competitive the European Railway Industry must deliver higher service quality to its customers (see also Annex III, Article 2.7.1 to the Directive (EU) 2016/797). A measurement process is an essential post trip process to support quality improvements. In addition to measuring the service quality delivered to the customer, LRUs, RUs and IMs must measure the quality of the service components that in total make up the product delivered to the customer. The process involves the IMs and the RUs (especially if they are Lead RUs) selecting an individual quality parameter, a route or location and a measurement period in which actual results are to be measured against predetermined criteria and which normally have been set out in a contract. The results of the measurement process must clearly show the achievement level against the target, which has been agreed upon between the contracting parties.

4.2.9. *The Main Reference Data*

4.2.9.1. Preface

In order to support the train preparation and wagon operation the wagon keeper shall make available rolling stock data in the Rolling Stock Reference Database.

4.2.9.2. The Rolling Stock Reference Databases

The keeper of rolling stock is responsible for the storage of rolling stock data within a Rolling Stock Reference Database.

The Information that must be included in the individual Rolling Stock Reference Databases is described in detail in Appendix I, Appendix C.

The Rolling Stock Reference Databases must allow easy access to the rolling stock reference data to minimise the volume of data transmitted for each operation. Contents of the Databases must be accessible, based on structured access rights depending on privilege to all Service Providers (especially IMs and RUs).

The entries in the Rolling Stock Reference Database can be grouped as follows:

— Administrative data, related to certification and registration items. Additionally, according to Commission Regulation (EU) No 445/2011 ([2]), article 5, the Wagon Keepers shall store the ECM certification identification number

— Design data, which shall include all constitutive (physical) elements of the rolling stock, especially information required by RUs for train planning and operation.

The keeper is obliged to ensure that these data are available and the processes behind have been conducted.

The definition of the mandatory structure of Rolling Stock Reference Database and the elements to be followed are described in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.10. *Various Reference Files and Databases*

4.2.10.1. Reference Files

For the operation of freight trains on the European network, the following reference files must be available and accessible to all service providers (IMs, RUs, logistic providers and fleet managers). The data must represent the actual status at all times. Where a reference file is in common use with the TAP TSI, the development and changes must be in line with TAP TSI, in order to achieve optimum synergies.

The European Union Agency for Railways will centrally store and maintain unique codes for the following reference data:

— Reference File of the Coding for all IMs, RUs, Service provider companies;

— Reference File of the Coding of Locations (Primary and subsidiary),

The Agency will save a copy of the Reference File for the Primary Locations Codes and Company Codes. On individual request and without prejudice to intellectual property rights, this data shall be available for public consultation.

Other code lists are defined in the document 'TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model' listed in Appendix I.

4.2.10.2. Wagon and Intermodal unit Operational Database (optional)

To allow for the tracking of train and wagon movements, the Wagon and Intermodal Unit Operational Database, updated at each relevant event in real time, may be installed. Authorised entities such as keepers and fleet managers may have access to the data relevant to fulfil their functions, according to bilateral agreements.

The communication between the Lead RU and RUs in the cooperation mode is based on wagon and/or Intermodal unit numbers. Therefore, an RU, which communicates with the IMs at train level, must break down this information into wagon and Intermodal unit related one. This wagon and Intermodal unit related information may be stored in the Wagon and Intermodal Unit Operational Database. The information on train movement leads to new entries/updates in the Wagon and Intermodal Unit Operational Database for customer information. The movement part for a wagon or Intermodal unit in the database is set up at the latest when receiving the release time for the wagons or Intermodal unit from the customer. This release time is the first

([2]) Commission Regulation (EU) No 445/2011 of 10 May 2011 on a system of certification of entities in charge of maintenance for freight wagons and amending Regulation (EC) No 653/2007 (OJ L 122, 11.5.2011, p. 22).

movement entry for a wagon into the Wagon and Intermodal Unit Operational Database related to an actual transport journey. The messages for the wagon movement are defined in the Chapter 4.2.7 (Wagon Movement). This database is accessible via the Common Interface (4.2.11.1: General Architecture and 4.2.11.6: Common Interface).

The Wagon and Intermodal Unit Operational Database is for the tracking of wagons and therefore for the communication between the RUs involved and the Lead RU. This database shows the movement of a wagon and of an Intermodal unit from departure through to final delivery at customer sidings with ETIs and actual times at different locations until the final delivery time ETA. The database also shows the different status of the rolling stock such as:

— Status: loading of the rolling stock

  This status is required for the information exchange between the RU and the IMs and to other railway undertakings involved in the transport journey

— Status: loaded wagon on journey

  This status is required for the information exchange between the IM and the RU, with other infrastructure managers and with other railway undertakings involved in the transport journey.

— Status: empty wagon on journey

  This status is required for the information exchange between the IM and the RU, with other infrastructure managers and railway undertakings involved in the transport journey.

— Status: unloading of rolling stock

  This status is required for the information exchange between the RU at destination and the Lead RU for the transport.

— Status: empty wagon under fleet management control

  This status is required to get the information about availability of a vehicle of defined characteristics.

4.2.10.3. Additional Requirements on the Databases

Every system (Data Base) must be clearly defined and its data consistency shall be supported by rules on data accessibility and data availability.

4.2.11. *Networking & Communication*

4.2.11.1. General Architecture

The aim of the IT architecture is to exchange information in secure trusted environment among all rail actors in the Single European Railway Area (SERA).

Over time this subsystem will see, the growth and interaction of a large and complex Telematics rail interoperability community with hundreds of participating players (RUs, IMs, etc.), which will compete and/or cooperate in serving the market's needs.

The Network & Communication infrastructure supporting such rail interoperability community will be based on a common Information Exchange Architecture, known and adopted by all those participating in it.

The proposed Information Exchange Architecture:

— is designed to reconcile heterogeneous information models by semantically transforming the data that are exchanged between the systems and by reconciling the differences in business process and application-level protocol,

— has a minimum impact on the existing IT architectures implemented by each actor,

— safeguards IT investments made already.

The Information Exchange Architecture is based on continuous IT industry mainstream standards, which ensure the relevant level of cybersecurity according to the identified risks. The interaction between all players must guarantee the overall integrity and consistency of the rail interoperability by providing a set of centralised services.

Architectural concept implementation, e.g. peer-to-peer communication, is based on technical standards for the Common Interface described in the technical document ERA-TD-104 'Annex D.2: Appendix E – Common Interface' listed in Appendix I.

A pictorial representation on the general architecture is given in the document 'TAF TSI – Annex A.5 Figures and Sequence Diagrams of the TAF TSI messages', Chapter 1.5, listed in Appendix I.

4.2.11.2. Network and Security

Network in this case means the method and philosophy of communication and does not mean the physical network.

The network shall ensure the necessary level for cybersecurity.

Rail interoperability is based on a common Information Exchange Architecture, known and adopted by all participants, thus encouraging and lowering barriers for new entrants, especially customers.

The security concept may be implemented on different layers of communication stack between two peers.

To achieve a high level of security, all messages must be self-contained, which means that the information in the message is secured and the receiver can verify the authenticity of the message. This may be solved by using an encryption and signing scheme similar to email encryption.

4.2.11.3. Encryption

Either asymmetric or symmetric encryption can be used for data transmission and storage, depending on the business requirements. For this purpose, a Public Key Infrastructure (PKI) is to be implemented.

The encryption is based on technical standards for the Common Interface described in the technical document ERA-TD-104 'Annex D.2: Appendix E – Common Interface' listed in Appendix I.

4.2.11.4. Central Repository

The Central Repository must be able to handle:

— metadata – structured data describing the content of messages,

— Public Key Infrastructure (PKI),

— Certification Authority (CA),

The management of the central repository should be under the responsibility of a non-commercial co-European organisation. Where the Central Repository is in use in conjunction with the TAP TSI, development and changes shall be performed as closely as possible to the implemented TAP TSI in order to achieve optimum synergies.

4.2.11.5. Common Interface

Compliance to the TSI, with respect to data exchange, means the exchange of mandatory TAF data catalogue elements (XSD) according to the provisions of TAF TSI Chapter 4.2.

This can use the Common Interface specifications including the use of XSD without any specific agreement between the involved parties. The CI specifications should be regularly adapted to take new communication technologies into account.

And combination of any communication technologies is possible if there is a specific agreement between the involved parties as long it is aligned with the CI specifications.

A Common Interface has to be able to handle:

— message formatting of outgoing messages according to the metadata,

— signing and encryption of outgoing messages,

— addressing of the outgoing messages,

— authenticity verification of the incoming messages,

— decryption of incoming messages,

— conformity checks of incoming messages according to metadata,

— handling the single common access to various databases.

Each instance of a Common Interface will have access to all the data required according the TSI within each Wagon keeper, LRU, RU, IM, etc., whether the relevant Databases are central or individual (see also document 'TAF TSI – Annex A.5: Figures and Sequence Diagrams of the TAF TSI messages', Chapter 1.6, listed in Appendix I).

Where a Common Interface is in common use with the TAP TSI, the development and changes shall be performed as closely as possible to the implemented TAP TSI, in order to achieve optimum synergies. Based on the results of authenticity verification of incoming messages, a minimum level of message acknowledgement can be implemented:

(i) positive send ACK;

(ii) negative send NACK.

A Common Interface uses the information in the central repository in order to manage the above tasks.

If an actor implements a local 'mirror' of the Central Repository, that actor must then – by its own means – ensure that the local 'mirror' is an accurate and up to date copy of the Central Repository.

4.2.11.6. Protocols

Only protocols belonging to the internet Protocol Suite (commonly known as TCP/IP, UDP/IP etc.) may be used for developments.

4.3. **Functional and technical specifications of the interfaces**

In light of the essential requirements in Chapter 3, the functional and technical specifications of the interfaces are as follows:

4.3.1. *Interfaces with the TSI Infrastructure*

The infrastructure subsystem includes traffic management, tracking, and navigation systems: technical installations for data processing and telecommunications intended for long-distance passenger services and freight services on the network in order to guarantee the safe and harmonious operation of the network and efficient traffic management.

The subsystem Telematics Applications for Freight uses the data required for operational purposes as given by the path contract, possibly completed by infrastructure restriction data, as provided by the IM. Thus, no direct interface exists between this TSI and the TSI for infrastructure.

4.3.2. *Interfaces with the TSI Control/Command and Signalling*

The only connection to control command and signalling is via the

— Path contract, where within the line segment description the relevant information about usable command control and signalling equipment is given, and

— various Rolling Sock Reference Databases, where the command control and signalling equipment of the rolling stock must be stored.

4.3.3. *Interfaces with the rolling stock subsystem*

The subsystem Telematics Applications for freight identifies the technical and operational data, which must be available for the rolling stock.

The rolling stock TSI specifies the characteristics of a wagon. If the characteristics changes for a wagon, this must be updated in the Rolling Stock Reference Databases within the normal maintenance process for the database. Thus, no direct interface exists between this TSI and the TSI for rolling stock.

4.3.4. *Interfaces with the TSI operation and traffic management*

The subsystem Operation and Traffic Management specifies the procedures and related equipment enabling a coherent operation of the different structural subsystems, both during normal and degraded operation, including in particular train driving, traffic planning and management.

The subsystem Telematics Applications for Freight mainly specifies applications for freight services including real-time monitoring of freight and trains and the management of connections with other modes of transport. In order to ensure consistency between both TSIs, the following procedure applies.

When the specifications of the TSI Operation and Traffic Management related to the requirements of this TSI will be written and/or will become subject to amendments, then the body in charge of this TSI must be consulted.

In the case that the specifications of this TSI related to operational requirements specified in the TSI Operation and Traffic Management should be subject to any amendment, the body in charge of the TSI Operation and Traffic Management must be consulted.

4.3.5. *Interfaces with the Telematics Applications for Passenger Services*

Interface	Reference Telematics Applications for Freight TSI	Reference Telematics Applications for passengers TSI
Train ready	4.2.3.3 Train ready message	4.2.14.1 Train ready message for all trains
Train running forecast	4.2.4.2 Train running forecast message	4.2.15.2 'Train running forecast' message for all trains
Train running information	4.2.4.3 Train running information	4.2.15.1 'Train running information' message for all trains
Train running interrupted to RU	4.2.5.2 Train running inter rupted	4.2.16.2 'Train running interrupted' message for all trains
Handling of short term timetable data	4.2.2 Path Request	4.2.17 Handling of short term time-table data for trains
Common Interface	4.2.11.6 Common Interface	4.2.21.7 Common interface for RU/IM communication
Central Repository	4.2.11.5 Central Repository	4.2.21.6 Central repository
Reference Files	4.2.10.1 Reference files	4.2.19.1 Reference files

4.4. **Operating rules**

In light of the essential requirements in Chapter 3, the operating rules specific to the subsystem concerned by this TSI are as follows:

4.4.1. *Data quality*

For data quality assurance purposes, the originator of any TSI message will be responsible for the correctness of the data content of the message at the time when the message is sent. Where the source data for data quality assurance purposes is available from the databases provided as part of the TSI, the data contained within those databases must be used for data quality assurance.

Where the source data for data quality assurance purposes is not provided from the databases provided as part of this TSI, the originator of the message must make the data quality assurance check from their own resources.

Data quality assurance will include comparison with data from databases provided as part of this TSI as described above plus, where applicable, logic checks to assure the timeliness and continuity of data and messages.

Data are of high quality if they are fit for their intended uses, which means they

— are Error free: accessible, accurate, timely, complete, consistent with other sources, etc., and

— possess desired features: relevant, comprehensive, proper level of detail, easy-to-read, easy-to-interpret, etc.

The data quality is mainly characterised by:

— Accuracy,

— Completeness,

— Consistency,

— Timeliness.

Accuracy:

The information (data) required needs to be captured as economically as possible. This is only feasible if the primary data is only recorded, if possible, on one single occasion for the whole transport. Therefore, the primary data should be introduced into the system as close as possible to its source, so that it can be fully integrated into any later processing operation.

Completeness:

Before sending out messages, the completeness and syntax must be checked using the metadata. This also avoids unnecessary information traffic on the network.

All incoming messages must also be checked for completeness using the metadata.

Consistency:

Business rules must be implemented in order to guarantee consistency. Double entry should be avoided and the owner of the data should be clearly identified.

The type of implementation of these business rules depends on the complexity of the rule. For simple rules, database constraints and triggers are sufficient. In case of more complex rules, which require data from various tables, validation procedures must be implemented which check the consistency of the data version before interface data are generated and the new data version becomes operational. It must be guaranteed that transferred data are validated against the defined business rules.

Timeliness:

The provision of information right in time is an important point. As far as the triggering for data storage or for message sending is event driven directly from the IT system the timeliness is not a problem if the system is designed in well manner according the needs of the business processes. But in most of the cases, the initiation of sending a message is done by an operator or at least is based on additional input from an operator. To fulfil the timeliness requirements the updating of the data must be done as soon as possible also to guarantee, that the messages will have the actual data content when sending out automatically by the system.

The response time for enquiries must be addressed for the various applications and user types within the detailed IT specifications. All data updates and exchanges shall be carried out as soon as possible.

Data quality Metrics:

The detailed IT specifications shall define appropriate percentages for:

— the completeness of data (percent of data fields having values entered into them) and the consistency of data (percent of matching values across tables/files/records),

— the timeliness of data (percent of data available within a specified threshold time frame),

— the required accuracy (percent of stored values that are correct when compared to the actual value).

4.4.2. *Operating the central repository*

The functions of the central repository are defined in Chapter 4.2.11.5 (Central Repository). For the purpose of data quality assurance, the entity operating the central repository shall be responsible for the updating and the quality of the metadata and also for the administration of the access control. Regarding the quality of the metadata in terms of completeness, consistency, timeliness and accuracy shall enable appropriate functioning for the purposes of this TSI.

4.5. Maintenance rules

In light of the essential requirements in Chapter 3, the maintenance rules specific to the subsystem concerned by this TSI are as follows:

The quality of the transport service must be guaranteed even if the data processing equipment were to break down in full or in part. It is therefore, advisable to install duplex systems or computers with a particularly high degree of reliability, and for which the uninterrupted operation during maintenance is ensured.

The maintenance aspects regarding the various databases are mentioned in Chapter 4.2.10.3 (Additional Requirements on the Databases).

4.6. Professional qualifications

The professional qualifications of staff required for the operation and maintenance of the subsystem and for implementing the TSI are as follows:

The implementation of this TSI does not require a complete new system in hardware and software with new staff. The realisation of the requirements of the TSI leads only to changes, upgrades or functional enlargements of the operation as it is already done by the existing staff. Therefore, there are no additional requirements to the existing national and European rules on professional qualifications.

If necessary, an add-on training of staff should not just consist of showing them how to operate equipment. The member of staff must know and understand his specific role to be played in the overall transportation process. Staff must in particular be aware of the requirement to maintain a high working performance level, since this is a decisive factor for the reliability of the information to be processed at a subsequent stage.

The professional qualifications needed for the composition and operation of trains are defined in the TSI Operation and Traffic Management.

4.7. Health and safety conditions

The health and safety conditions of staff required for the operation and maintenance of the subsystem concerned (or the technical scope as defined in paragraph 1.1) and for the implementation of the TSI are as follows:

There are no additional requirements to existing national and European rules on health and safety.

5. INTEROPERABILITY CONSTITUENTS

5.1. Definition

According to Article 2(7) of Directive (EU) 2016/797:

Interoperability constituents are 'any elementary component, group of components, subassembly or complete assembly of equipment incorporated or intended to be incorporated into a subsystem, upon which the interoperability of the rail system depends directly or indirectly. The concept of a "constituent" covers both tangible objects and intangible objects such as software'.

5.2. List of Constituents

The interoperability constituents are covered by the relevant provisions of Directive (EU) 2016/797.

There are no interoperability constituents determined as far as the subsystem Telematics Applications for Freight is concerned.

For the fulfilment of the requirements of this TSI only standard IT equipment is needed, without any specific aspects for interoperability in the railway environment. This is valid for hardware components and for the standard software used like operating system and databases. The application software is individual on each user's side and can be adapted and improved according the individual actual functionality and needs. The proposed 'application integration architecture' assumes that applications might not have the same internal information model. Application integration is defined as the process of making independently designed application systems work together.

5.3. Constituents' Performances and Specifications

See Chapter 5.2, not relevant for the TSI 'Telematics Applications for Freight'.

6. ASSESSMENT OF CONFORMITY AND/OR SUITABILITY FOR USE OF THE CONSTITUENTS AND VERIFICATION OF THE SUBSYSTEM

6.1. Interoperability Constituents

6.1.1. *Assessment Procedures*

Not relevant for the TSI Telematics Applications for Freight.

6.1.2. *Module*

Not relevant for the TSI Telematics Applications for Freight.

6.2. Subsystem Telematics Applications for Freight

According to Annex II of the Directive (EU) 2016/797, the subsystems are broken down into structural and functional areas.

The conformity assessment is obligatory for TSIs in the structural area. The Subsystem Telematics Application for Freight belongs to the functional area and this TSI does not determine any modules for conformity assessment.

6.2.1. *Assessment of compliance of IT tools*

Projects in charge of IT tools deployed by the European rail sector may request the Agency to assess the compliance of those against the TSI requirements.

Request for assessment shall be accompanied by:

— Use Case document including:

— TAF TSI function covered

— Reference to TAF TSI chapter

— List and documentation of messages (including their sequence) to be tested

— Description of IT System, which uses TAF messages

— Description of communication interface of IT System (CI, other etc.)

— Information if request is for milestone of an EU funded project

— Version of the TAF TSI technical documents relevant to the scope of the assessment of the compliance

— XML file(s) of the IT System and their corresponding XSD file(s)

The Agency performs TAF TSI compliance test and issues an Agency compliance assessment report to the applicant within 3 months after confirming completeness. Compliance report covers following aspects:

— If the Message(s) carries all mandatory elements from TAF TSI,

— If the Message(s) complies with the TAF TSI technical documents,

— If the Messages sequence is compliant with TAF TSI.

Other than XML messages can also be delivered for test to determine whether they carry mandatory elements from the TAF TSI. In such case instead of XSD file(s) of the IT System it shall be delivered a message structure description with description of the data elements/fields, mentioning when applicable the applied standard(s) and their version.

7. IMPLEMENTATION

7.1. Introduction

This TSI concerns the subsystem telematics applications for freight. This subsystem is functional according to Annex II to Directive (EU) 2016/797. The application of this TSI therefore does not rely on the notion of new, renewed or upgraded subsystem, as is customary in the case of TSIs related to structural subsystems, except where it is specified in the TSI.

(a) Project governance

The development and deployment is put under the governance of the Steering Committee.

The Steering Committee shall provide for the strategic management structure to efficiently manage and coordinate the work for implementing the TAF-TSI. This shall involve setting the policy, the strategic direction and prioritisation.

The Steering Committee, co-chaired by the Commission and a person nominated by the rail sector representative bodies, shall be composed of:

— the representative bodies from the railway sector acting on a European level as defined in Article 5(3) of Regulation (EU) 2016/796 ('the rail sector representative bodies');

— the Agency;

— the Commission and

— other organisations proposed to the Steering Committee to be included as observers where there are sound technical and organisational reasons for doing.

(b) Development of the system

All actors concerned shall deploy the system following their individual master plan. For actors who have not submitted an individual master plan, their communicated individual plan is binding.

(c) Deployment and operation monitoring process

The monitoring of the deployment and operation harmonized throughout Europe is managed by the TAF Implementation Cooperation Group (ICG).

The ICG, established and managed by the Agency, is composed of:

— the Agency;

— the National Contact Points (see Appendix III);

— the Representatives Bodies and

— other organisations designated by the Agency and having relevant technical and organisational experience.

The ICG is made responsible for:

— assessing the progress of implementation and operation, analysing the deviations from the Master Plan and proposing improvement actions;

— assisting the NCPs to follow-up the TAF TSI implementation and operation at national level;

— approving the reports about the TAF TSI implementation and operation;

— reporting via the Agency to the European Commission.

7.2. **Change Management**

7.2.1. *Change Management Process*

Change management procedures shall be designed to ensure that the costs and benefits of change are properly analysed and that changes are implemented in a controlled way. These procedures shall be defined, put in place, supported and managed by the Agency and shall include:

— the identification of the technical constraints underpinning the change,

— a statement of who takes responsibility for the change implementation procedures,

— the procedure for validating the changes to be implemented,

— the policy for change management, release, migration and roll-out,

— the definition of the responsibilities for the management of the detailed specifications and for both its quality assurance and configuration management.

The Change Control Board (CCB) shall be composed of the Agency, rail sector representative bodies and Member States. Such an affiliation of the parties shall ensure a perspective on the changes that are to be made and an overall assessment of their implications. The CCB ultimately shall be brought under the aegis of the Agency.

7.2.2. *Specific Change Management Process for documents listed in Appendix I to this Regulation*

The change control management for the documents listed in Appendix I to this Regulation shall be established by the Agency in accordance with the following criteria:

(1) The change requests affecting the documents are submitted either via the Member States or via the representative bodies from the railway sector acting on a European level as defined in Article 38(4) of Regulation (EU) 2016/796, or via the TAF TSI Steering Committee.

(2) The Agency shall gather and store the change requests.

(3) The Agency shall present the change requests to the dedicated ERA working party, which will evaluate them and prepare a proposal accompanied by an economic evaluation, where appropriate.

(4) Afterwards the Agency shall present each change request and the associated proposal to the change control board that will or will not validate or postpone the change request.

(5) If the change request is not validated, the Agency shall send back to the requester either the reason for the rejection or a request for additional information about the draft change request.

(6) If the change request is validated, the technical document shall be amended.

(7) If no consensus about the validation of a change request can be reached, the Agency shall submit to the Commission a recommendation to update the documents listed in Appendix I together with the draft new version of the document, the change requests and their economic evaluation and shall make these documents available on their web site.

(8) The new version of the technical document with the validated change requests shall be made available at the site of the Agency. The Agency will keep the Member States informed via the Committee established in accordance with Article 51(1) of Directive (EU) 2016/797.

(9) If a change request would require a change of the legal text of the TAF TSI, the Agency shall send a request to the European commission to request a revision of the TAF TSI and/or request the technical opinion from the Agency.

(10) Where change control management affects elements which are in common use within the TAP TSI, the changes shall be made so as to remain as close as possible to the implemented TAP TSI in order to achieve optimum synergies.

Appendix I

List of technical documents

The version in force of these technical documents is published on the website of the Agency.

No	Reference	Title
1	ERA-TD-100	TAF TSI – ANNEX A.5:FIGURES AND SEQUENCE DIAGRAMS OF THE TAF TSI MESSAGES
2	ERA-TD-101	TAF TSI – Annex D.2: Appendix A (Wagon/ILU Trip Planning)
3	ERA-TD-102	TAF TSI – Annex D.2: Appendix B – Wagon and Intermodal Unit Operating Database (WIMO)
4	ERA-TD-103	TAF TSI – Annex D.2: Appendix C – Reference Files
5	ERA-TD-104	TAF TSI – Annex D.2: Appendix E – Common Interface
6	ERA-TD-105	TAF TSI – Annex D.2: Appendix F – TAF TSI Data and Message Model

Appendix II

Glossary

Term	Description
AB	See Allocation body
Allocation body	Body responsible for path allocation, which is independent in its legal form, organisation and decision-making from any railway undertaking (Directive 2012/34/EU of the European Parliament and of the Council ([1])).
Applicant	means a railway undertaking or an international grouping of railway undertakings or other persons or legal entities, such as competent authorities under Regulation (EC) No 1370/2007 of the European Parliament and of the Council ([2]) and shippers, freight forwarders and combined transport operators, with a public-service or commercial interest in procuring infrastructure capacity (Directive 2012/34/EU). The applicant can take the roles and the assigned tasks and responsibilities of Lead RU (Lead railway undertaking) and/or Responsible Applicant and/or Responsible RU depending on specific network statement.
Block train	A specific form of a direct train with only as much wagons as needed, running between two transhipment points without intermediate marshalling.
Booking	The process of making a reservation for space on a means of transport for the movement of goods.
CA	Certification Authority
CN-code	8-digit Code list for products used by customers.
Combined road-rail transport or Combined Transport	Intermodal transport where the major part of the European journey is by rail and any initial and/or final legs carried out by road are as short as possible.
Consignee	Party by whom the goods are to be received. Synonym: Goods receiver
Consignment	Freight sent under a single contract of carriage. In combined transport, this term may be used for statistical purposes, to measure loading units or road vehicles.
Consignment note	A document, which evidence a contract for the transportation by a carrier of one consignment from a named place of acceptance to a named place of delivery. It contains details of the consignment to be carried.
Consignor	Party which, by contract with a Service Integrator, consigns or sends goods with the carrier, or has them conveyed by him. Synonyms: Shipper, Goods sender.
Cooperation mode	Mode of train operation where various RU cooperate under the leadership of one RU (LRU). Each involved RU contracts the needed path for the transport journey on its own.
CT	Combined Transport
Customer	Is the entity which has issued the consignment note to the Lead RU.
Departure date/time, actual	Date (and time) of departure of means of transport.
Direct train	A train with related wagons which runs between two transhipment points (initial source – final destination) without intermediate marshalling.

Term	Description
Duty holder	Any individual or legal entity responsible for the risk, which he imports onto the network, i.e. the RU.
Encryption	Encoding of messages Decryption: converting encrypted data back into original form
ETA	Estimated Time of Arrival (at destination). The estimated time of arrival (ETA) is the time when the train is expected to arrive at a certain place. Estimates can be based on production plans (predictions) and/or stochastic computation.
ETH	Estimated Time of Handover of a train from one IM to another.
ETI	Estimated Time of Interchange of wagons from one RU to another.
ETP	Estimated Time of Pick-Up (at arrival intermodal terminal)
Forecast Time	Best estimate of arrival, departure or passing time of a train.
Gateway	Station within the journey of a train with Intermodal units, where the load changes the wagons.
Gross weight of load	Booked/actual total weight (mass) of goods, including packing but excluding the carrier's equipment.
Handling point	Station where the RU may change the train composition, but where it remains responsible for the wagons, no change of responsibility.
Handover point	Location of train's journey or between two paths where the responsibility for planning and/or allocation and/or operation changes from one IM to another. The involved IM assumes the role Planning IM.
Haulage	Transport by road
Hirer	Any individual or other legal entity designated as such by the keeper/owner of a wagon.
HS code	6-digit Code list for products used by customers, identically to the first 6 digits of the CN Code.
IM	Infrastructure Manager means some body or firm responsible in particular for establishing, managing and maintaining railway infrastructure, including traffic management and control-command and signalling; the functions of the infrastructure manager on a network or part of a network may be allocated to different bodies or firms. Where the infrastructure manager, in its legal form, organisation or decision-making functions, is not independent of any railway undertaking, the functions referred to in Sections 2 and 3 of Chapter IV shall be performed respectively by a charging body and by an allocation body that are independent in their legal form, organisation and decision-making from any railway undertaking. (Directive 2012/34/EU). An IM can assume the roles Responsible IM and/or Planning IM
Infrastructure manager (IM)	See IM
IM Entry Point	Section where the CT train leaves the intermodal terminal area and enters the first public IM network
IM Exit Point	Section where the CT train leaves the last public IM network and enters the arrival terminal

Term	Description
Interchange	The Transfer of control from one railway undertaking to another for practical operational and safety reasons. Examples are: — Mixed services, — Services with shared haulage responsibility, — The transfer of information between different railway administrations, — The transfer of information between wagon owners/keepers and train operators.
Interchange point	Location of train's journey or of a path where the transfer of responsibility for the whole train from one Responsible RU to another Responsible RU takes place.
Intermediate point	Location which defines a point of a train's journey or path between its start (origin) or end (destination) point.
Intermodal Service Integrator	Any body or undertaking, which has the contract with customers for the transport of Intermodal units. He is preparing waybills, managing capacity on block trains etc.
Intermodal terminal	Location which provides the space, equipment and operational environment under which the loading units (freight containers, swap bodies, semi-trailers or trailers) transfer takes place.
Intermodal transport	The movement of goods in one and the same loading unit or vehicle, which uses successively several modes of transport without handling of the goods themselves in changing modes.
Intermodal Loading Unit	Containers, swap bodies and semi-trailers suitable for combined transport
Journey	A 'journey' denotes the spatial forwarding of a train or of a loaded or empty wagon from the forwarding station to the destination station.
Journey section	Is the part of the journey which takes place on an infrastructure sector of an infrastructure manager or Part of the journey from the entry handover point to the exit handover point of the infrastructure of an infrastructure manager.
Keeper	The person, who being the owner or having the right to dispose of it, exploits a vehicle economically in a permanent manner as a means of transport and is registered as such in the Rolling Stock Register.
Lead Railway Undertaking	Applicant/RU, which is responsible to organise and manage the transport line according to the customer's commitment. It is the single point of contact for the customer. If more than one Railway Undertaking is involved in the transport chain, the LRU is responsible for the coordination of the various Railway Undertakings on the harmonization of train's journey including the various path requests.
LRU	See Lead Railway Undertaking
MAY	This word, or the adjective 'OPTIONAL', means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item.

Term	Description
	An implementation, which does not include a particular option, MUST be prepared to interoperate with another implementation, which does include the option, though perhaps with reduced functionality. In the same vein an implementation, which does include a particular option, MUST be prepared to interoperate with another implementation, which does not include the option (except, of course, for the feature the option provides).
Metadata	Simply put, is data about data. It describes data, software services, and other components contained in the enterprise information systems. Examples of the types of metadata include standard data definitions, location and routing information, and synchronisation management for distributing shared data.
MUST	This word, or the terms 'REQUIRED' or 'SHALL', mean that the definition is an absolute requirement of the specification.
MUST NOT	This phrase, or the phrase 'SHALL NOT', means that the definition is an absolute prohibition of the specification.
One Stop Shop (OSS)	An international partnership between rail Infrastructure Managers providing a single point of contact for rail customers for the purposes of: — Ordering specified train paths in international freight traffic, — Monitoring the entire train movement, — Generally also invoicing track access charges on behalf of IMs.
Open Access mode	Mode of train operation where only one RU is involved, which runs the train on various infrastructures. This RU contracts the needed paths with all involved IMs.
OSS	One Stop Shop
Path	Path means the infrastructure capacity needed to run a train between two places over a given time-period (Route defined in time and space).
Path assembly	Joining up of individual train paths to extend path in terms of time and space.
Peer-to-Peer	The term 'peer-to-peer' refers to a class of systems and applications that employ distributed resources to perform a critical function in a decentralised manner. The resources encompass computing power, data (storage and content), network bandwidth, and presence (computers, human, and other resources). The critical function can be distributed computing, data/content sharing, communication and collaboration, or platform services. Decentralisation may apply to algorithms, data, and metadata, or to all of them. This does not preclude retaining centralisation in some parts of the systems and applications if it meets their requirements.
PKI	Public key infrastructure
Place of delivery	Place where the delivery happens (departure rail station to be given). A place where responsibility for the wagon is changed.
Place of departure	Place from which a means of transport is scheduled to depart or has departed.

Term	Description
Place of destination	Place at which the means of transport is due to arrive or has arrived. Synonym: Place of arrival
Planning IM	The Planning IM (PIM) is the Infrastructure Manager who is responsible for elaboration and allocation of a path. The responsibility area of PIM is defined by handover points e.g. used as first/last journey location in Path Information of Path Request Message or of an offered/booked path. In most cases, the RIM will be the same entity as the Planning IM. However, for some locations and/or some trains, path elaboration and also traffic monitoring in operations may also be delegated to another IM.
PIM	See Planning IM
Pre-departure Period	Is the delta time before the scheduled time of departure. The pre-departure period starts at scheduled time of departure minus delta time and ends at the scheduled time of departure.
Primary data	Basic data as reference data input for messages or as the basis for functionality and calculation of derived data.
Put into Service	A procedure dependent on the technical approval of a wagon and a contract for use with a RU, which allows commercial operation of the wagon.
Railway Undertaking (RU)	Railway undertaking (Directive (EU) 2016/798): means railway undertaking as defined in point (1) of Article 3 of Directive 2012/34/EU, and any other public or private undertaking, the activity of which is to provide transport of goods and/or passengers by rail on the basis that the undertaking must ensure traction; this also includes undertakings which provide traction only. A RU can assume the roles Lead RU and/or Responsible Applicant and/or Responsible RU
Responsible Applicant (RA)	The RA is the applicant/customer and contractor as well as the single point of contact for respective IM (infrastructures manager) in the whole planning process phase. The main task of the role RA is to request the booking of capacity to an IM. The RA does not need to be a Railway Undertaking, it can also be another entity, which is able and permitted to book capacity.
Responsible IM	The Responsible IM (RIM) is the Infrastructure Manager who is the owner of the respective network and responsible for all operational handling of trains and paths on its network.
Responsible RU (RRU)	The RRU is responsible for the run of the train in operation phase, for the whole journey or a section of the journey. If more than one RRU is involved in operating the train, the responsibility is transferred from one RRU to the next RRU at the interchange point. The RRU is the contact entity for the IM in operation phase for all message exchange. Based on an agreement with Responsible Applicant, RRU can also task a subcontractor with running the train, the RRU will nevertheless remain the point of contact for the IM in operation phase.
Release date/time	Date/time when the goods are expected to be released or were released by the customer.

Term	Description
Release time for wagons	Date and time when the wagons are ready to be pulled from the named place on the customer siding.
Reliability, Availability, Maintainability, Safety (RAMS)	Reliability – The ability to start and continue to operate under designated operating conditions for a designated period expressed mathematically; Availability – The time in operation compared to the time out of service expressed mathematically; Maintainability – The ability of a system to be put back into service after a failure expressed mathematically; Safety – The probability of a hazardous event being initiated by the system expressed mathematically.
Reporting point	Location on the train journey, where the responsible IM has to issue a 'train running forecast message' with TETA to the path contracted RU.
Repository	A repository is similar to a database and data dictionary; however, it usually encompasses a comprehensive information management system environment. It must include not only descriptions of data structures (i.e. entities and elements), but also metadata of interest to the enterprise, data screens, reports, programs, and systems. Typically, it includes and internal set of software tools, a DBMS, a metamodel, populated metadata, and loading and retrieval software for accessing repository data.
RIV	Regulations governing the reciprocal use of wagons in international traffic. Regulations governing the reciprocal use of loading tackle, container and pallets in international traffic.
Route	The geographical way to be taken from a starting point to a point of destination.
Route section	A part of a route
RU	See Railway Undertaking
Scheduled time of departure	Date and Time of departure for which the path is requested.
Scheduled Timetable	Chronologically defined occupation of rail infrastructure for a train movement on open line or in stations. Changes to the timetables will be supplied by the IM s at least 2 days before the commencement of the day when the train departs from its origin. This timetable applies to a specific day. Known in some countries as the Operational Timetable.
Service Disruption	Means the unplanned stop of a train during operation, without any information regarding the continuation of the journey
Service Provider	Responsible carrier for this specific transport stage. Party who receives and handles the booking.
Shipment	Wagons or intermodal loading units transported under the terms of a single consignment, irrespective of the quantity or number of containers, packages, or pieces. Also called consignment.
Short notice path request	Individual request for a path according to Directive 2012/34/EU, due to additional transport demands or operational needs.

Term	Description
SHOULD	This word, or the adjective 'RECOMMENDED', mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
SHOULD NOT	This phrase, or the phrase 'NOT RECOMMENDED' mean that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.
Stakeholders	Any person or organisation with a reasonable interest in train service delivery e.g.: Railway Undertaking (RU), Shipment monitoring provider, Locomotive provider, Wagon provider, Driver/Train crew provider, Hump yard provider, Switch move provider, Service integrator, Slot provider (IM), Train controller (IM), Traffic manager, Fleet manager Ferry boat provider, Wagon, locomotive inspector, Wagon, locomotive repair provider, Shipment manager, Switching & humping provider, Logistic provider, Consignee, Consignor, **For Intermodal in addition:** Container Provider, Intermodal terminal operator, Drayage provider/Haulage company, Steam ship, Barge lines.
Terminal Operator	Means an organisational entity, which has been made responsible for the management of a marshalling yard, multimodal or intermodal terminal, port terminal
TETA	See Train Estimated Time of Arrival
Tracing	Activity at request of finding and reconstructing the transport history of a given consignment, vehicle, equipment, package or cargo.

Term	Description
Tracking	Activity of systematically monitoring and recording the present location and status of a given consignment, vehicle, equipment, package or cargo.
Train	Definition of OPE TSI: A train is defined as (a) traction unit(s) with or without coupled railway vehicles with train data available operating between two or more defined points.
Train Time of Estimated Arrival	Estimated Time of Arrival of a train at a specific point, e.g. handover point, interchange point, destination of the train.
Train path	See 'path'
Transhipment	The operation of moving intermodal loading units from one means of transport to another.
Trip plan	For wagon or Intermodal unit shows the planned reference trip of the wagon/ Intermodal unity.
Unit capacity used	Code to indicate to which extent the equipment is loaded or empty. (e.g. full, empty, LCL).
Unit Load	A number of individual packages bonded, palletised or strapped together to form a single unit for more efficient handling by mechanical equipment.
Unit train	A freight train dispatched with only one consignment note and only one type of goods and composed of uniform wagons running from a consignor to a consignee without intermediate marshalling.
Wagon load	A unit load whereas the unit is a wagon.
Consignment order	A subset of the consignment note which shows the relevant information for a RU, needed to carry on the transportation during its responsibility until handover to a next RU. Instruction for the transportation of a wagon consignment.
Waybill	The document made out by the carrier or on behalf of the carrier evidencing the contract for the transport of cargo.

([1]) Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (OJ L 343, 14.12.2012, p. 32).

([2]) Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70 (OJ L 315, 3.12.2007, p. 1).

Appendix III

Tasks to be undertaken by the TAF/TAP National Contact Point (NCP)

(1) Act as point of contact between the Agency, and railway players (Infrastructure Managers, Railway Undertakings, Wagon Keepers, Station Managers, Ticket Vendors, Intermodal Operators, Rail Freight Customers and relevant associations) in the Member State in order to ensure that the railway players are engaged with TAF and TAP and are aware of general developments and decisions of the Steering Committee.

(2) Communicate the TAF TSI implementation and operation concerns and views of the railway players in the Member State to the TAF/TAP Steering Committee after analysis by the Implementation Cooperation Group.

(3) Liaise with the Member State Railway Interoperability and Safety Committee (RISC) member ensuring that the RISC member is briefed on national issues relating to TAF/TAP prior to each RISC meeting and ensuring that RISC decisions relating to TAF/TAP are communicated appropriately to affected railway players.

(4) The Member State ensures that all licensed Railway Undertakings and other railway players (Infrastructure Managers, Railway Undertakings, Wagon Keepers, Station Managers, Intermodal Operators, Rail Freight Customers and relevant associations) are contacted and provided with NCP details and advised to make contact with the NCP if contact is not already established.

(5) To the extent that railway players in the Member State are known, make them aware of their obligations under the TAF and TAP regulations and that they must comply with them (regarding TAF TSI implementation and operation).

(6) Liaise with the Member State to ensure that an entity is appointed to be responsible for populating the Central Reference Files Database with primary location codes. The identity of the appointed entity shall be reported to DG MOVE for appropriate distribution.

(7) Facilitate information sharing between the Member States' railway players (Infrastructure Managers, Railway Undertakings, Wagon Keepers, Station Managers, Ticket Vendors, Intermodal Operators, Rail Freight Customers and relevant associations) in the Member State.