TAF-TSI Master Plan

17th January 2013

Contents

Executive Summary

The final version of the TAF-TSI Master Plan, establishing the implementation timeline for the Regulation, was submitted to the TAF-TSI Steering Committee, DG MOVE and ERA on 15th November, 2012.

A total of 58 companies, representing over 85% of the total Tonne and Track Kilometres in Europe responded with their individual plans for implementation. Target dates were set when 80% or more of the respondents indicated a final implementation. The target dates are based on the corresponding TAF-TSI function to be implemented.

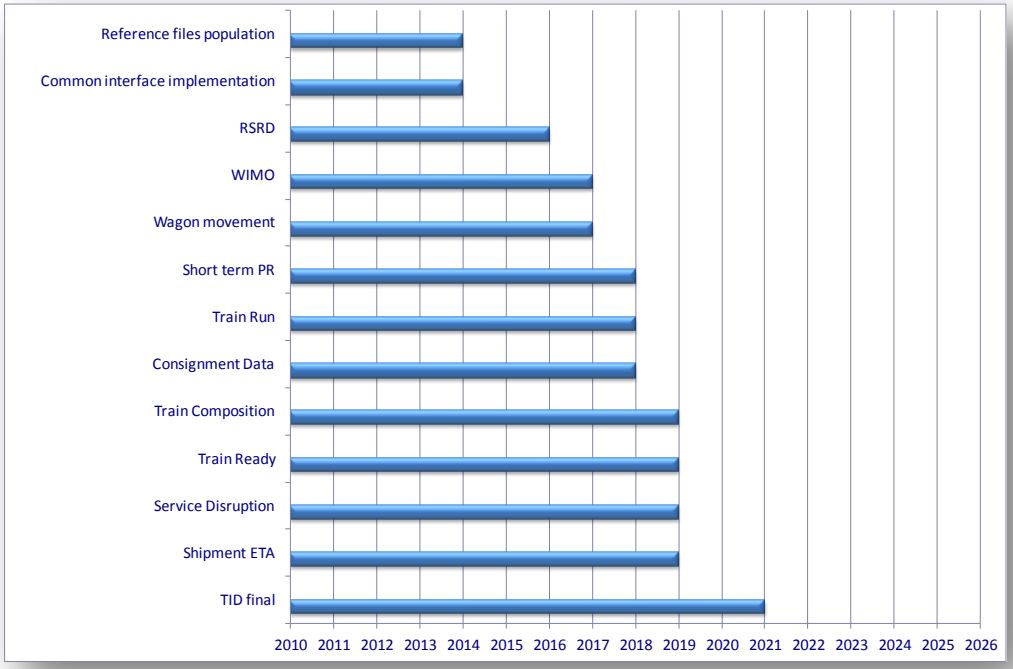
The results show that most of functions of the TAF-TSI can be realised by the end of 2018, with most functions operational by 2016. The most difficult part of the realisation will be the implementation of the unique Train Identifiers (TID), upon which many other functions are dependent. A pragmatic, phased approach, whereby existing systems can be used to implement TAF compliant functions without the TID will be explored during the implementation.

An analysis, based on Corridor Regulation N° 913/2010, was also incorporated into this Master Plan. As the Corridor Regulation specifically addresses Short Term Path Requests and Train Running Information, these were the only functions included. It should be noted that the TAF-TSI is a supporting tool – and not a prerequisite – for the implementation of 913/2010. Therefore the later date of implementation of the TAF-TSI should have no impact on the implementation of 913/2010.

Most corridors will be ready for TAF-TSI implementation in 2017 for the major functions.

The priority future activity will be to monitor progress on the implementation amongst the Stakeholders, according the Master Plan. This will depend on the active involvement of the Stakeholders, but also **necessitate the involvement of high-level management** in those companies that have submitted planning. This activity must be done in cooperation with the Commission and the Representative Bodies in order to integrate all stakeholders, including those that did not originally submit individual plans. In particular, self-binding plans from (hundreds of) actors weren't delivered so that it is unknown how those companies will fulfil their obligation.

Below is a chart of the target dates for implementation. A detailed analysis and risk assessment of each function is outlined in the report.



The final Master Plan and all supporting documents are posted on the ERA website.

1 Background

In 2006, the sector developed a consolidated Strategic European Deployment Plan (SEDP) to the commission for the realization of the TAF-TSI. The SEDP was the elaboration of an overall TAF system development plan from concept-to-delivery. The document was prepared by the sector and submitted to the European Commission in January 2007 and was comprised of individual corporate plans addressing the SEDP rollout. These plans were synchronized to form a comprehensive implementation for the TAF-TSI.

The SEDP included the identification of those major system and sub-system activities that are necessary to achieve the implementation of the TAF system, with intermediate and verifiable milestones derived from the synthesis of detailed planning delivered from the major actors in the European rail freight industry.

Individual companies (Infrastructure Managers and RUs) representing over 85% of the freight volumes in Europe delivered individual plans for their own implementation of the major functions of the TAF. Reflecting the results, the SEDP Plan reflected a full implementation of the TAF-TSI by the end of 2014.

The acceptance letter issued by the Commission, dated on 2 July 2007 clearly states that

> *'Once the strategic plan is completed, all activities related to the implementation of the subsystem Telematic Applications for Freight have to be justified against this deployment plan.'*

In order to effectively monitor and report the progress against this plan, an efficient sector-driven organisation must be put into place specifically to define and coordinate the work-plans of the sector stakeholders against the SEDP commitments supplied to the Commission.

This must also include any recommendations for modifications to the Regulation or the timeline.

The implementation has diverged from the original SEDP planning, therefore a new comprehensive and realistic plan must be delivered.

2 The Master Plan for TAF-TSI Implementation

2.1 The Master Plan

This deliverable is the first step in the elaboration of an overall TAF system development plan from concept-to-delivery. What this document shows is that the great majority (in terms of market share) of the European rail freight industry has presented individual plans addressing the TAF-TSI rollout. These plans will then be synchronized, wherever achievable and reasonable, and will form a comprehensive Master Plan for the implementation of the TAF-TSI.

Although we have received responses from companies representing approximately 90% of the market share for IMs and 80% for RUs, there are hundreds of smaller RUs who have not submitted individual planning. It would be beneficial to have their responses in order to arrive at the best rollout plan for the sector.

It can be seen from the charts in Chapter 5 that the European rail freight industry has individually submitted plans which will achieve the full implementation of TAF-TSI functionality over the Master Plan period. These plans have then been consolidated using a statistical approach to arrive at a Master Plan that can be agreed by the Sector.

2.2 Companies Responding

ACF
ADIF
B-Cargo
BDK
CaptrainIT
CD cargo
CEMAT
CFL infra
CFR Infrastructure
CP Carga
DB Netz
DB Schenker
DB Schenker Rail (NL)
DB Schenker Rail (UK)
DB Schenker Rail Bulgaria
DB Schenker Rail Polska
DB Schenker Rail Romania
DB Schenker Rail Scandinavia (DK)
DB Schenker Rail Schweiz (CH)
EuroCargo Rail SAS (FR)
EuroCargo Real (ES)
Eurotunnel
FTA
Green Cargo
Gysev
Gysev Cargo

Hector Rail
HUPAC-CH
HUPAC-IT
Infrabel
MAV IM
Mitteldeutsche Eisenbahn
MMV
Network Rail
Nordcargo SRL (IT)
ÖBB infra
PLK
ProRail
RBH Logistics (DE)
RCA
RCH
REFER
Renfe
RFF
RFI
SBB Cargo
SBB infra
SNCF Fret
SZ cargo
SZ infra
SZDC
Trafikverket
Transportes Ferroviarios Especiales (ES)
Trenitalia
VPE
VR
ZSR
ZSSK

2.3 Consolidation Phase and final Master Plan Delivery

The consolidation phase and final agreement was concluded 6 months after the delivery of the initial submission. This was a major achievement not only in synchronisation, but also in approach towards the improvement of the rail freight industry in Europe.

The rollout plan will not place any undue burden on those companies who have submitted an individual plan under the terms of the revision of the Regulation. It will allow those companies to come into line with the target dates proposed and develop more detailed milestones to achieve those dates.

This approach has been supported by both the Sector and the Commission and was established at the TAF-TSI Deployment Steering Committee meeting on 23rd April, 2012.

This consolidated Master Plan should be aligned with the to be delivered TAP Master Plan for the RU and IM communications. Once this Master Plan has been approved, the TAF-TSI Steering Committee will oversee and coordinate the implementation effort.

2.4 Scope

This deliverable provides the detail planning for the integration of legacy facilities as well as a risk assessment of the crucial phases of such a plan. Interim solutions are offered for early implementation of TAF functions in order to reduce the risk of implementation.

Although the Master Plan specifically addresses the timelines for implementation by function, a Corridor Analysis has been added. This analysis tries to address the expectations of the Regulation concerning a European rail network for competitive freight.

2.5 Corridor Approach

The TAF-TSI was approved before the publication of the regulation 913/2010 so it doesn't completely support the processes described in the Corridor Regulation 913/2010. Additionally, the TAF functions are useful in the implementation of 913/2010, but are not prerequisites.

The Corridor Regulation addresses two major functions in developing the rail freight corridors in terms of infrastructure capacity and performance. The corresponding TAF-TSI functions are those concerning the RU-IM communications that will establish the necessary information flow necessary to operate the corridors. Not all TAF-TSI functions are necessary for such implementation. Specifically, the Corridor Regulation concentrates on the two following functions:

Path Allocation

Traffic Management

As stated in the Corridor Handbook:

> *"Concerning path allocation specific objectives are to ensure smooth and efficient processes to obtain good and reliable train paths, making use of appropriate IT-tools. There has to be flexibility to accommodate even late and ad hoc capacity requests. Information has to be transparent and easily accessible and requests for capacity open to applicants other than railway undertakings.*
>
> *When it comes to traffic management a specific objective is to ensure that sufficient priority is given to freight trains aiming at achieving the punctuality targets set by the Management Boards of the corridors and ensuring that freight trains which are "on time" can keep their path even in case of traffic disturbances. Furthermore traffic management has to be coordinated between several Infrastructure Managers and performance has to be monitored along the corridors"1*

The Corridor approach must be further analysed by the Corridor Managers to arrive at a comprehensive implementation plan by corridor. Additionally, the TAF implementation is company-related (responsibility of each company to realize the functions based on their capabilities) and not specifically corridor related. It can be argued that once an IM has implemented the TAF functions, then their part of the

1 Handbook on the Regulation concerning a European rail network for competitive freight (Regulation EC 913/2010), 30 June 2011.

corridor is also implemented. Once an RU has implemented its Master Plan, this RU should be able to operate in compliance with TAF-TSI on all corridors if related IM has implemented the function.

Furthermore, it is difficult to determine which RU partners are within a corridor, because potentially all RUs could operate on each and every corridor. Therefore, this analysis is much more dependent on the participating IMs within each corridor.

The Joint Sector Group[2]'s conclusion is that the Corridor approach is a valid analysis tool, however the implementation rests on the company approach. This is why this Master Plan will focus primarily on the TAF Functions for establishing timelines. While target dates and objectives will be deeply analyzed, the estimation of the costs is out of the scope of this document because investments in TAF-TSI will be managed at company level coherently with the submit tted plan.

2.6 Methodology

This deliverable is based on individual stakeholder responses to the proposed Framework Plan as originally submitted to the industry in December 2011 and then extended through 1st November 2012. The Framework Plan was also supplemented with the reference documents produced over the past 36 months so that the Stakeholders could properly assess the effort required for each TAF-TSI Function and estimate the corresponding implementation dates.

2.6.1 Weighting

In order to determine the completeness of the responses and the risk associated with the implementation of each function, companies were weighted in terms of their market share. In the case of Infrastructure Managers, each company was assessed in terms of their total track kilometres. In the case of Railway Undertakings, each company was assessed in terms of their total tonne kilometres.

The statistics were based on 2009 reporting to the UIC, the most reliable set of statistics available.

These statistics, however, are incomplete as not all IMs and RUs have submitted individual Master Plans nor have they reported into the UIC statistics database. However, if a company who had not reported into the UIC statistics submitted a plan, their market share was determined and added into the overall figures. Although not complete, the weighting provides a reliable method for analysing the responses.

2.6.2 Determining Target Dates

The target dates for implementation of each function addressed in this Master Plan were based on the year in which 80% of the respondents have realised a function. In the case where there are significant differences in implementation dates between the IM and RU responses, a median target date was chosen where partial implementation of a function could be achieved using existing applications.

If there is a significant percentage outside of the target date, the outlying companies are identified and a risk reduction analysis is offered. In most cases, the function can be realised at an earlier date by using existing application systems. For instance, some companies' realisation of certain functions is dependent on the full implementation of the TIDs. It may be possible, in most cases, to implement the functions without the full implementation of the TIDs.

2 The Joint Sector Group includes the main stakeholders which have obligations/interest in TAF-TSI (CER, UIC, RNE, UIP, ERFA, UIRR, EIM, UNIFE)

2.7 The Reference Documents

For the past three years, Working Groups have been addressing implementation issues and proposing required revisions to the TAF-TSI Regulation. They were organised into RU and IM Clusters.

The participating RUs and IMs have made a great effort to analyse and to propose changes to the TAF-TSI. Around 100 business experts have worked in several WGs. In more than 1000 work-days, the old version of the TAF-TSI was analysed in relation to the functions as presented in this Master Plan. Based on the findings of the rail experts, change requests were prepared in close cooperation with the deployment team.

The output of the current working groups so far comprises Change Requests (CRs) to the Regulation and its technical annexes. All of these CRs have now been processed through the CCM[3] and were approved by RISC to be included in the referenced Technical Annexes.

Copies of the Implementation Guides and revised schemas were annexed to the Framework Plan so that individual companies may evaluate the impact and their implementation milestones and timelines. The Implementation Guides are public and they are available at the UIC Web Site (http://www.uic.org/spip.php?article447). ***The output of the working groups was used as the baseline.***

Sector Working Groups have provided a solid basis for the implementation guidelines including TAP, however these guidelines must be refined after the change management process is completed (after publication.)

The following Reference Documents are published and were used as the basis for implementation:

- Train Monitoring
- Train Preparation
- Short-Term Path Request
- Wagon Orders
- Wagon Movement
- Reference Files
- Rolling Stock Reference Database
- Train Identification (TID)

In order to fulfil the amended TAF-TSI regulation, the change requests submitted to the European Railway Agency also include inputs from the TAP TSI working groups in order to have harmonized technical documents which could be applicable for both TAF and TAP regulations. The harmonization process is not over, but a common playfield was established.

3 CCM: Change Control Management, a dedicated process managed by the European Railway Agency to modify/correct the TAF-TSI Techinical Documents.

3 Development of the new Master Plan

3.1 Follow-up of TAF-TSI Implementation

The priority activity will be to monitor progress on the implementation amongst the Stakeholders. This will depend on the active involvement of the Stakeholders, but also **necessitate the involvement of high-level management** in those companies that had submitted original planning in the SEDP and others. This activity must be done in cooperation with the Commission and the Representative Bodies in order to integrate all stakeholders, including those that did not originally submit individual plans. In particular self-binding plans from (hundreds of) actors weren't delivered so that it is unknown how those companies will fulfil their obligation.

3.2 Framework Plan – Reporting Template

A Framework Plan provided the basis for planning compliance with TAF-TSI for organizations in the European rail transport chain.

As in the SEDP, each company was obliged to define their own timeline. This timeline indicated the requisite KPIs (Milestones) for implementation and was detached from the history of the project. It reflected a realistic view of what the companies are able to achieve.

The Framework Plan was organised by function as opposed to messages, with each individual function supported by messaging and business processes. The functions were divided into the following categories:

RU Only Functions

- Consignment Note Data
- Wagon & Intermodal Operating Unit Data (WIMO)
- Wagon Movement
- Shipment ETA

Joint IM/RU Functions

- Common Interface
- Reference Files
- Train Running Information and Train Delay Cause
- Train Forecast
- Service Disruption
- Train Enquiries
- Train Preparation
- Infrastructure Restriction Notice
- Adhoc Path Request
- Train Transport Identifier

3.3 Considerations for Phasing the Implementation

In the new chapter 7 of the TAF-TSI Regulation, different phases are mentioned. These phases provide good indicators for a stepwise approach to the implementation. Companies were asked to provide milestones for these phases so that a complete analysis could be done on necessary milestones for the implementation of the functions.

These phases are:

- phase one: detailed IT specifications and Master Plan;
- phase two: development;
- phase three: deployment.

Phase One: detailed IT specifications and Master Plan

This includes the activities from the stakeholders and the EC (ERA) before the development can be started. This includes the time to establish implementation resources within his/her own company and to determine what processes must be put into place for the implementation. This also included the validation of Change Requests by ERA in order to establish the baseline technical documents.

Phase two: development and first deployment (Process, Definition and Resources ready)

This includes the development and first deployment from the stakeholders. In addition, a company may wish to start implementation using existing systems and data exchange to fulfil a TAF-TSI Function. Therefore, existing company and international solutions (TIS, PCS, RSRD, Orfeus, Hermes messages and ISR) could be used.

- Start with company development projects
- Use of the Reference Files for data Exchange
- Use of existing and TAF-TSI data exchange
- Use of existing and TAF-TSI processes and tools
- Process development in the companies
- TIDs are not used during that phase
- Running a Change Management Process for detected Changes

Phase Three: deployment and pilot (Implementation starting with Existing applications or TAF-TSI Exchange through fully compliant implementation)

Development for Functions that can be built on existing systems and data exchange can be deployed. In addition special solutions like TID shall be piloted and deployed in the beginning.

If any new system development is foreseen, then the stakeholder shall develop that system for TAF/TAP compliance. This includes:

- Finalising company development projects
- Using the Reference Files for data Exchange
- Using TAF-TSI data exchange
- Using TAF-TSI processes and tools
- Finalising developments in the companies
- TID`s are piloted during that phase
- Change Management Process is fully established

At the end of Phase III, the TAF will be fully deployed and in operational use.

When submitting an individual implementation plan, the Stakeholder considered ***each individual function*** in terms of application and data requirements and determined whether their legacy systems are able to support the processes and message exchange.

4 Overall Implementation and Target Dates

4.1 Min/Max/Averages from the Responses

The chart below shows non-weighted responses of the stakeholders submitting individual plans. Each response is broken down by the TAF-TSI function that will be implemented. This diagram shows that there is a wide diversity in implementation schedules amongst the participants. A closer analysis, by function will follow in Chapter 5 that provides an analysis on how to limit risks.

Many of the later implementation dates are due to a dependency on the realisation of the unique TID. Many of these functions can be realised much earlier if a phased TID implementation approach is used.

Additionally, existing international and stakeholder applications can be used to bring in the functions at an earlier date.

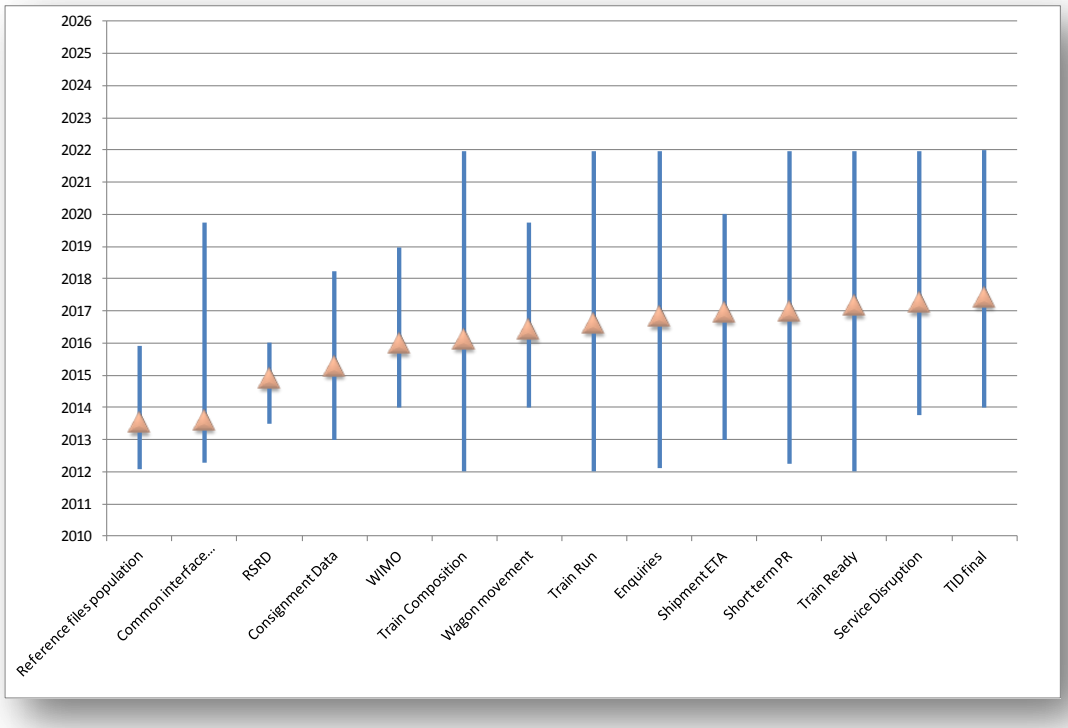


Figure 1 - Minimum and Maximum Implementation Dates

4.2 Target Implementation Dates

As explained in the Methodology chapter, target dates were chosen when 80% or more of the respondents have indicated a final implementation. The target dates are based on the corresponding TAF-TSI function to be implemented. This shall provide the basis for discussion during the consolidation phase.

The target date corresponds to the end of the calendar year (i.e. 31/12/20XX), although some functions may come in earlier.

The target date for functional implementation, without the (TID) is established during 2018.

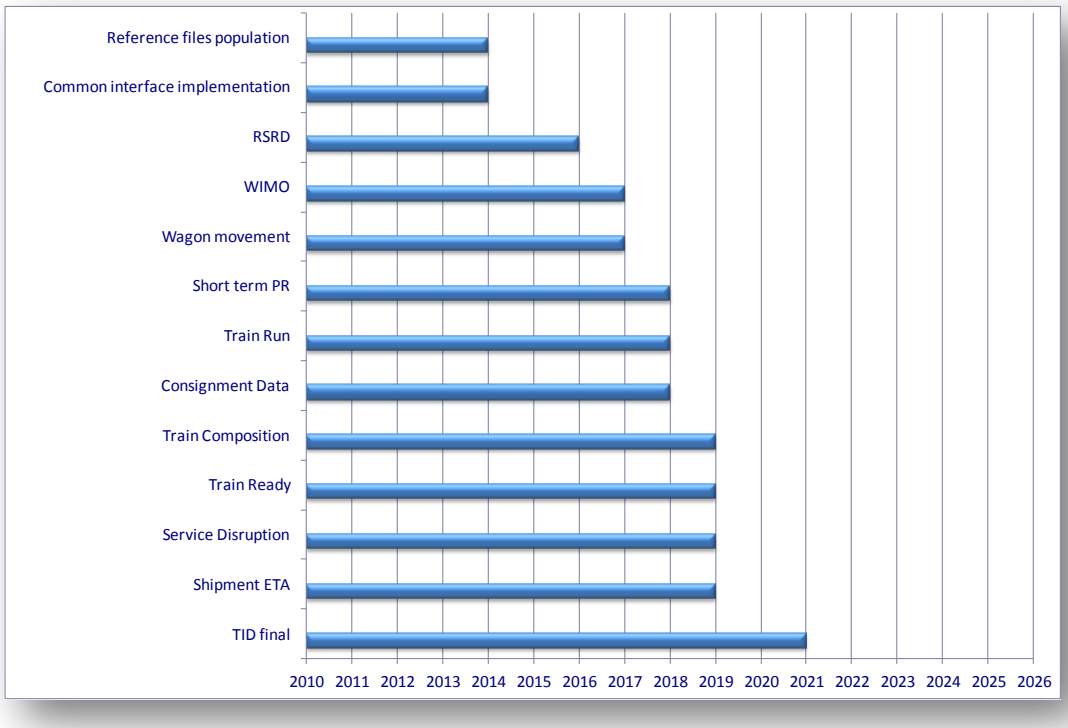


Figure 2 - Target Implementation

5 Implementation of the TAF-TSI Functions

The following functions are specified in the TAF-TSI Regulation and must be treated in the individual planning. They are broken into RU-Only functions and Joint IM-RU functions. These functions have been re-grouped according to the organisation of the Working Groups and Implementation Guides.

Each Function contains a description of the TAF-TSI requirement (messaging and/or processes), and implementation milestone.

5.1 Realisation of the Reference File Function

Function Type	Prerequisite
Target Implementation Milestone	2013
Impact	IM and RU

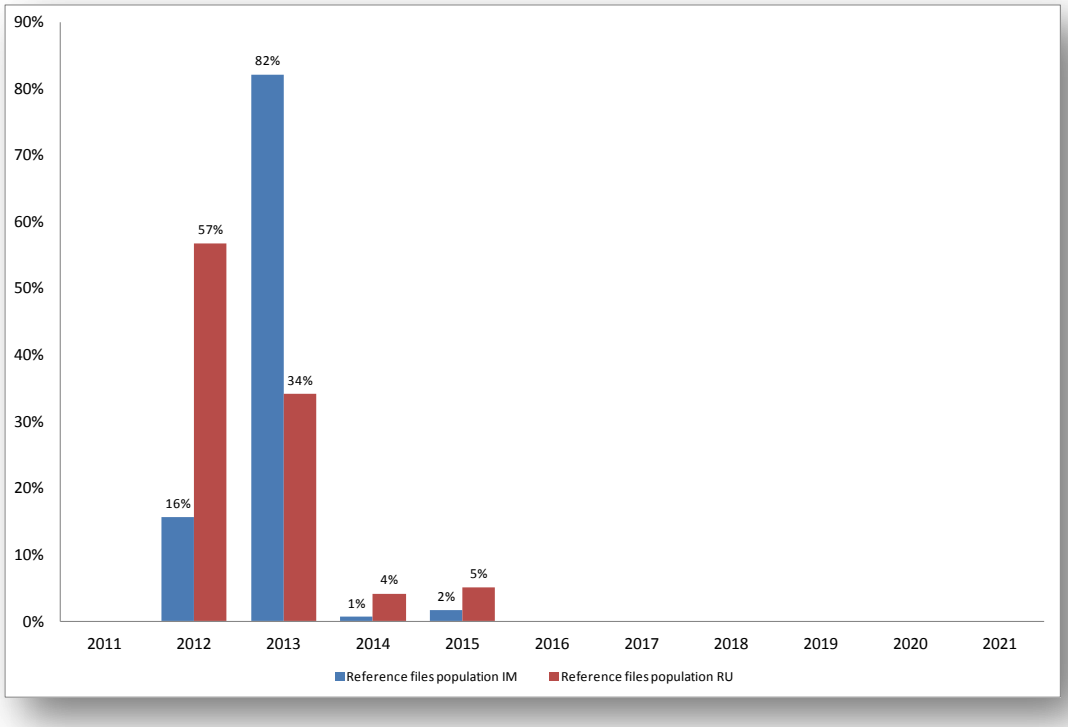


Figure 3 : Reference File Company response

5.1.1 TAF-TSI Requirement

The Reference Files for LocationIdent and CompanyIdent provide the necessary building blocks for quality data exchange and are a Common Component requirement of the TAF-TSI. The population of the reference files is a common priority for both IMs and RUs and will be one of the first milestones.

Delivery of the Reference File platform was made available for rollout in January 2012. It supports both a message-based update function as well as an interface for manual data entry. Additionally, a web service is offered to stakeholders to replicate the reference data in their local system.

Use of common reference file data is a pre-condition for all data exchange between the IMs and RUs. Additionally, the identification of the CompanyIdent is a pre-

condition for the usage of the Common Interface, as it is used for identification for routing and message processing.

The individual Stakeholders may choose to maintain translation tables between their legacy codification systems and the reference file data, however must be able to populate the databases with up-to-date information.

For the LocationIdent reference file, the Infrastructure Managers are mostly responsible for the allocation of the PrimaryLocationCode. This is a prerequisite for the allocation of the SubsidiaryLocationCode by the RU.

As the CompanyIdent reference file is managed by a central allocation authority/entity, it is already in place and ready for use.

The distribution curve indicates that over 80% of the respondents will be ready to populate the reference files and begin using the data in messaging by 2013.

The responses are TAF-TSI based only and they don't include requirements coming from TAP TSI activities.

5.1.2 Outlying Companies and Risk Reduction

SBB Infrastructure has indicated that they will implement in 2015.

SBB presents a risk in Corridors 1 and 2. There was no further information available on the SBB implementation; however, this does not present a great risk to the corridor as they are currently using the ENEE database. There is no consequence to the Corridor implementation as they will be ready in 2015 to coincide with the corridor implementation.

Additionally, it is still necessary to establish the governance for maintenance and publication of the data between the Commission, ERA, TAP, CCG and the stakeholders' prior full implementation.

5.2 Realisation of the Common Interface Function

Function Type	Prerequisite
Target Implementation Milestone	2013
Impact	IM and RU

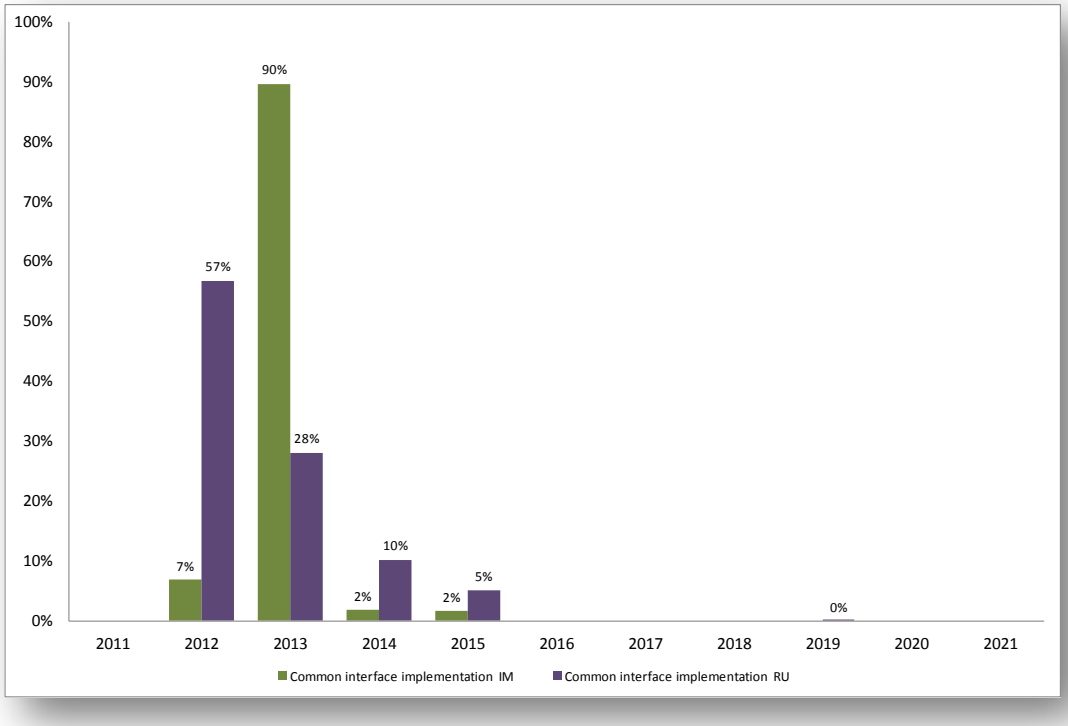


Figure 4: Common Interface Company Response

5.2.1 TAF-TSI Requirement

Much like the Reference Files, the Common Interface function is a Common Component requirement mandated by the TAF-TSI and must be realised by both IMs and RUs. The Common Interface provides the ability for all stakeholders to exchange information, and must be put into place prior to the realisation of any other function. This is a common priority with a rapid deployment timeline.

The CCG Common interface will be the reference implementation. If another interface is used to exchange TAF messaging, it must be compliant with the reference implementation in terms of respecting the metadata, header and routing functions and be compliant with the PKI from the CCG Certificate Authority.

The Common Interface was made available in January 2012 for rollout. In assessing the Stakeholder implementation, respondents were asked to address when the Common Interface could be installed, and when legacy system connectivity could be established.

The CCG will publish agreed terms and conditions to use the developed Common Interface software by non CCG stakeholders (by summer 2012.)

5.2.2 Outlying Companies and Risk Reduction

The distribution curve indicates that over 80% of the respondents will have the Common Interface installed and be operational, connected to legacy systems by 2013.

The following companies have reported an implementation date beyond the target:

RUs	IMs
B-Logistics	Infrabel
CD cargo	SBB infra
HUPAC-IT	
Renfe	
SBB Cargo	

Many of the outlying companies reported that they already have an enterprise communication bus used for message exchange and must closely examine the API compatibility with the Common Interface. In most cases, the CI (or a compliant Interface) will be installed at the Stakeholder's premises, however not fully connected to the applications that will support the messaging to support each function. The outlying companies did not want to replace their ESB with the CI for mapping.

Additionally, many stakeholders had dependencies on connectivity to their legacy system depending on function – therefore, final implementation is tied to the date that the last function is implemented.

Most of the respondents will use a stepped approach to the implementation of the CI, whereby they will start connecting to legacy systems, but as new systems are developed they would migrate to generated messages in native TAF XML formats. Therefore, they would not be using the reference Common Interface.

This risk is rather low, as most of the respondents will be able to generate and translate the TAF messages without having the use the CI for those functions. They could just use the transport and security functions of the reference implementation of the CI. Additionally, implementation of 2015 will assure that the rest of the functions can be implemented within the target timeframe.

The CCG published agreed terms and conditions to use the developed CI software by non CCG stakeholders (summer 2012.)

5.3 Realisation of the Unique Train Identifiers

Function Type	Milestone
Target Implementation Milestone	2020
Impact	IM and RU

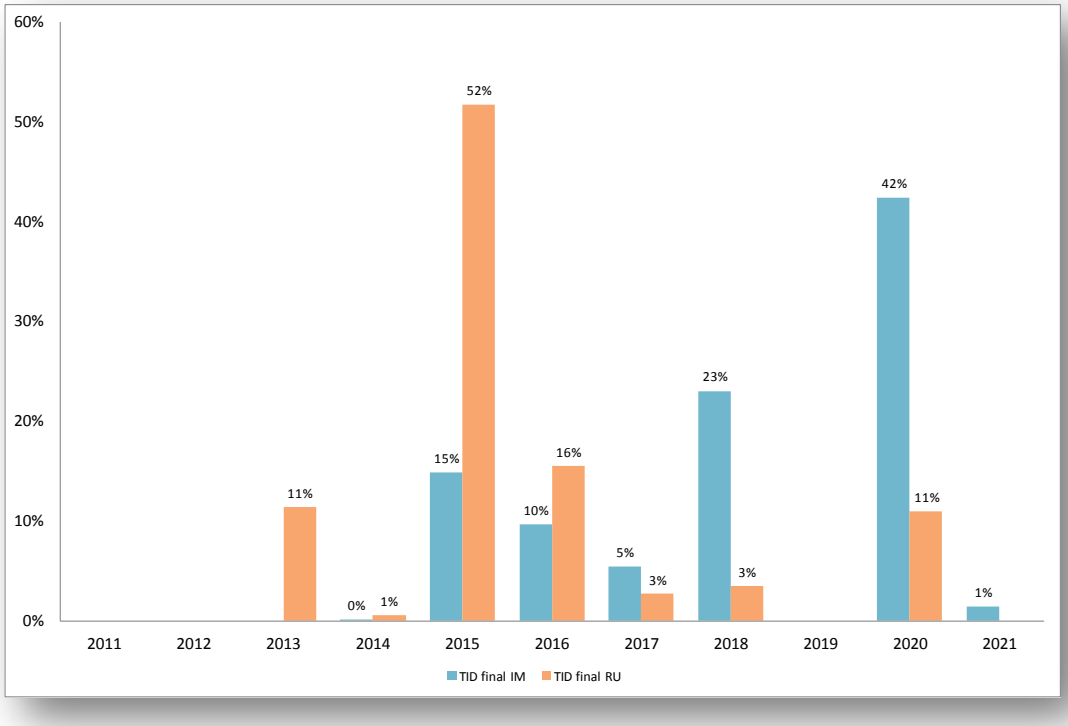


Figure 5: Unique TID Company Response

5.3.1 TAF-TSI Requirement:

The aim of this requirement is to define a unique ID for all trains and paths over the complete lifecycle of the train. This is dependent on all companies complying with the rules set out in the implementation guide developed by WG10.

The individual responses clearly show that a majority of the respondents regard the implementation of the TID as a milestone and not a precondition for realization of the TAF-TSI. A stepped approach is recommended in the Guideline and is also recommended in this Master Plan. However, there are some companies who clearly believe that there are dependencies on the TID.

The Implementation Guide recognises that changing legacy systems will be complex and that a solution will be required to connect the legacy operational train number (OTN) to the new IDs. It also puts forward a proposal for the standardisation of all IDs used in the relevant TSIs (Technical Standards for Interoperability) TAF and TAP to simplify future exchange of data between systems. It gives a complete business overview about the solution of how to deal with the identifiers used in all TAF-TSI Messages.

Therefore the TID will not be used during the first two phases of the TAF-TSI Implementation. Nevertheless the full benefits of the TAF-TSI will only be available for the sector after the TID has been implemented by all stakeholders.

In addition, the migration from the existing solutions to the TID will have to be defined during the first two phases of TAF-TSI implementation.

5.3.2 Outlying Companies and Risk Reduction

The distribution curve shows that over 90% of the respondents will have a final implementation of the TID by 2020. Only ProRail has indicated a later implementation date.

The implementation guide calls for a stepped approach for the TID implementation, using the Operational Train Number during the pilot and transition phases. This will allow the stakeholders to implement the individual TAF-TSI functions without having to fully realize the TID function. Most companies have stated that they will realize functions using the Operational Train Number.

Some companies, however, have clearly stated that the implementation of some functions (mainly Path Request) developed in phases (with and without the new identifiers) will be too resource intensive. Therefore based on effort calculation, it was determined that a full implementation is required and that it is not possible to remove the dependency on the TID. Additionally, to distinguish between train and path will be a fully new business approach for some companies causing a full redesign of company applications.

The messages have been modified through the ERA CCM process in order to allow this transition. This will allow companies to use either the Operational Train Number or the TID in all of the TAF-TSI messages. This will minimize the impact of migration to full utilization of the TID.

5.4 Realisation of the Infrastructure Restriction Notice Function

5.4.1 TAF-TSI requirement:

The RU must be able to enquire about infrastructure restrictions which may affect the composition of its train.

The Infrastructure Restriction Notice Function is realised only by the IMs, however the databases and information is made available to the RUs. The sector is currently looking at defining the requirements and process to support this function. Given that there are no requirements specifications available, it was not possible to analyse the implementation of this function.

The implementation of the Infrastructure Restriction Notice will depend on the outcome of the joint OPE and TAF working party and will be addressed at a later date. It is therefore not included in the Master Plan.

5.5 Realisation of the Path Request Function

Function Type	Milestone
Target Implementation Milestone	2017
Impact	IM and RU

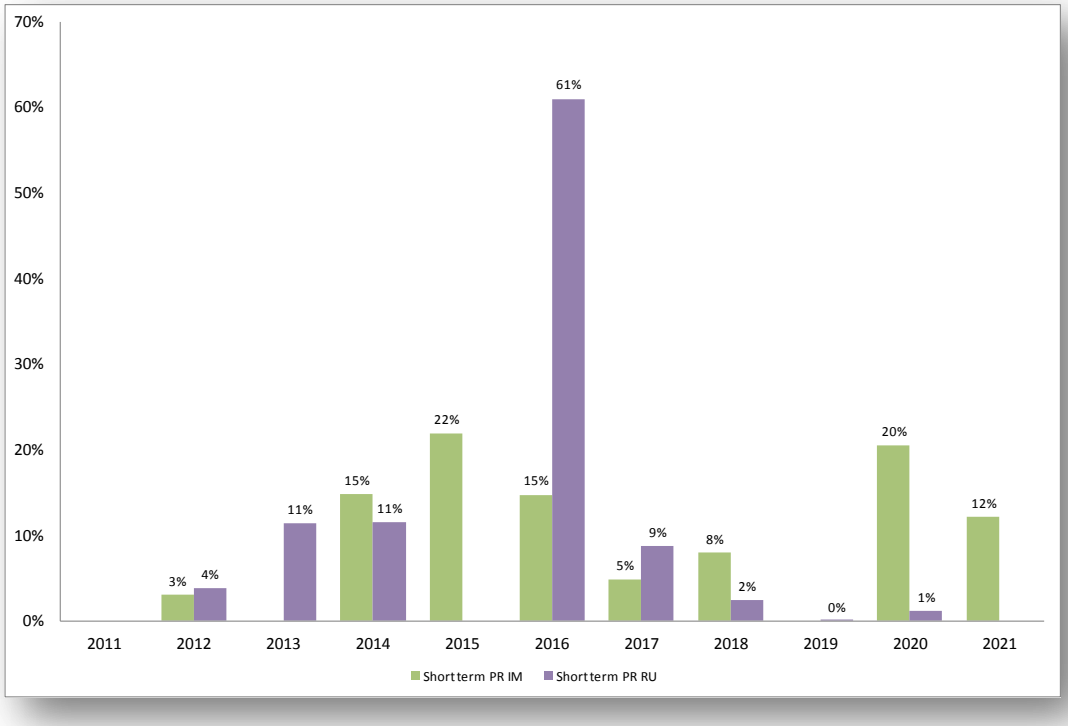


Figure 6: Short Term Path Request Company response

5.5.1 TAF-TSI requirement:

RUs must have the possibility to get an Ad Hoc Path

- exceptions during the train run
- Transport demands on a short term basis

The Path agreement for a train movement at short notice is based on

- dialogue between all RUs and IMs involved in moving the train

The following messages used for Path Request must be sent

- Path Request RU to IM
- Path Details IM to RU
- Path Confirmed RU to IM
- Path Details Refused RU to IM
- PathDossier RU to IM (New Requirement)

The Path Request Function as defined in the TAF-TSI is to accommodate short-term path requests outside of the long-term planning phase. This is a priority function for both the IMs and the RUs, although it will require profound process and IT system modifications. This function can be split into two distinct areas: 1) The realisation effort on the part of the RUs to organise the international path request and 2) the effort to coordinate and deliver a short-term path amongst the involved IMs.

The working group proposed that having the focus just on the short-term process is not a complete representation of all short-term activities that take place. In some cases regular train services need to have short term changes applied to them (alterations, cancellations etc.). However without including long-term planning in TAF-TSI, it is not clear how the changes can take place as there is a need to identify a train across the different phases of planning. Identifiers will need to be linked across the whole lifecycle of planning. Without incorporating this into TAF-TSI every TAF-TSI Stakeholder will be required to develop their own solution to handle this.

Apart from being technically complex and open to interpretation, it may also be very expensive to implement (this is subject to further analysis). Long term planning processes provide the link to the short term planning processes have been developed by WG5. This is with the view of resolving the Identifier information exchange. The benefit of this is that it adopts a clear, consistent and single approach that is in line with TAF-TSI principles.

The Messages to be implemented are found below:

Message 'Path Request' This message is used for the following actions:

- original path request from RU to IM/AB with status 'new'
- path request with status 'deletion' in case the request is withdrawn
- path request with status 'alteration' in case the RUs wants to modify an element

Message 'Path Details' This message is used for the following action(s):

- path details from IM/AB to RU with status 'new' for an indication 'offered' (this includes draft offer, final offer)
- path details message with status 'new' for an indication 'no alternatives available'
- path details message with status 'new' for an indication 'booked path not available'
- path details message with status 'alteration' for an indication (e.g. type of answer = booked)

Note: for offers, earliest and latest arrival/departure times will be identical

Message 'Path Confirmed' This message is used for the following action:

- Path confirmation from RU to IM/AB with status 'new'

Message 'Path Details Refused' This message is used for the following action:

- refusal of path details from the RU to IM/AB with status 'new'
- refusal of path details from the RU to IM/AB with status 'alteration' if it refers to an alternative

Message 'Path Cancelled' This message is used for the following action:

- (partial or full) path cancellation from RU to IM/AB with status 'new'
- (partial or full) path cancellation from RU to IM/AB with status 'alteration', if just a partial cancellation had been sent at the beginning

Message 'Path Not Available' This message is used for the following action:

- booked path not available notification from IM/AB to RU with status 'new'

New Message 'Path Dossier' This message is used for the following actions:

- create, edit and delete any element in a dossier with status 'new', 'alteration' or 'deletion'

New Message 'Answer Not Possible' *Remark: Identical need as already highlighted by TAF-TSI WG 2. For the final version of the TAF-TSI Implementation Guidelines, the two new message proposals of the WGs 2 & 5 will be merged together. The message is dependent on a full use case and is mainly to be used within the Path Request function.*

5.5.2 Outlying Companies and Risk Reduction

The distribution curve shows that over 70% of the IM respondents and 90% of the RU respondents will be able to implement the Short Term Path Request function by 2017. The outlying companies are ADIF, DB Netz, CFR Infrastructure, ProRail, REFER and SZ Infrastructure.

In order to reduce risk of a late implementation, a general implementation strategy could be to use PCS (path Coordination System) for international trains in the beginning and then to connect the national planning systems to PCS. PCS shall be able to use the TAF-TSI Messages and the CI therefore making the function TAF-TSI compliant.

DB Netz, for instance has stated that their development of the interface to PCS and the adaption of company system shall be done at the latest before end of 2015 to be used for the TT period 2016. For national trains, the path order tool "Trassenportal" with an xml interface is in place and is used by a majority of the market.

It is apparent from the responses that the final implementation is dependent on the new transport identifiers (TID, Path ID, Path Request ID, etc.) However the phasing approach can be used along with the existing international applications to realize this function without full implementation of the TID.

5.6 Realisation of the Train Preparation Function

Function Type	Milestone
Target Implementation Milestone	2018
Impact	IM and RU

This function includes the Train Ready and Train Composition Messages.

Train Ready Message

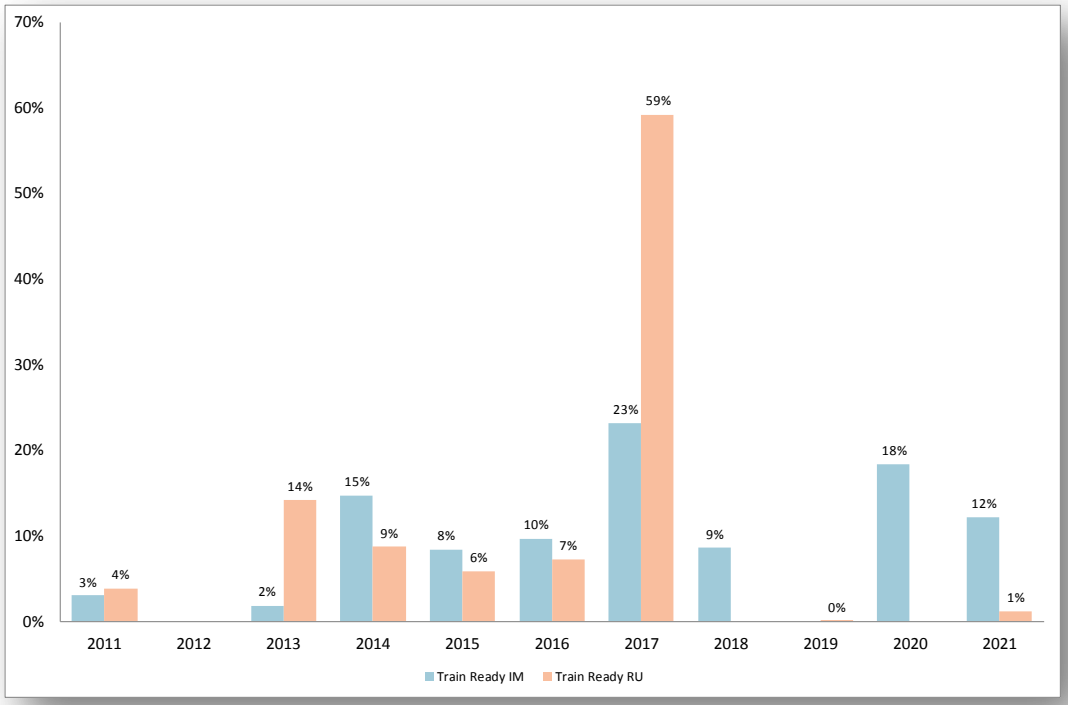


Figure 7: Train Ready Message Company Response

Train Composition Message

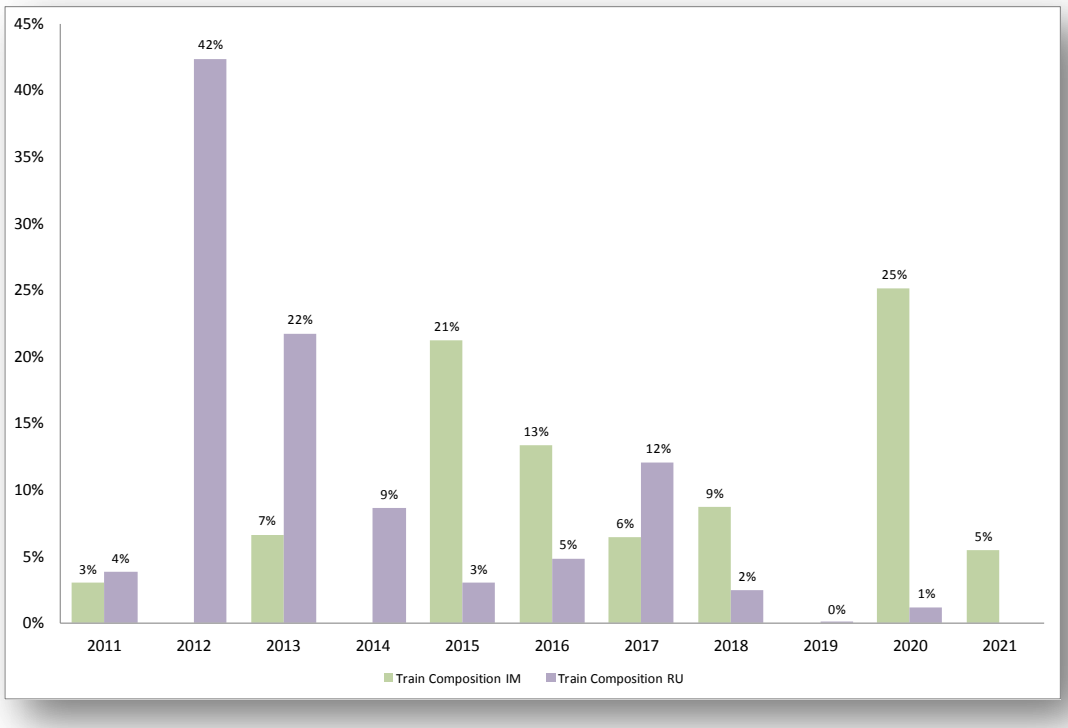


Figure 8: Train Composition Company Response

5.6.1 TAF-TSI requirement:

For Train Preparation, RUs must have access to:

- the infrastructure restriction notices
- the technical wagon data (Rolling Stock Reference Databases)
- the dangerous goods reference file
- the current, updated information status on the wagons
- (Wagon and Intermodal Unit Operational Database)

The Train Preparation Function comprises the data exchange between IMs and RUs. This function relies on the realisation of prior functions such as the Common Interface, Reference Files and Rolling Stock.

Due to the regulations and business practices in each country, a common process could not be agreed. However, the data content and definition for the messages have been published in the schemas.

The messages below are to be implemented for Train Preparation:

TAF Ref	Message	Description
4.2.3.3	TrainAccepted (Optional)	This message is sent from the IM back to the RU indicating, that the train composition is acceptable for the booked path. This message is optional unless agreed to IM/RU.
4.2.3.2	TrainComposition	This message is sent from an RU to an IM defining the composition of the proposed train
4.2.3.4	TrainNotSuitable (Optional)	This message is sent from the IM back to the RU indicating that the train composition provided

TAF Ref	Message	Description
		is not suitable for the previously agreed path. This message is optional unless agreed to IM/RU.
4.2.3.5	TrainReady	This message is sent from an RU to IM indicating that the train is ready for access to the network.
4.2.3.6	TrainPosition (Optional)	This message is sent from IM to RU defining exactly when and where the train should present itself upon the network. This message is optional unless agreed to IM/RU.
4.2.3.7	TrainAtStart (Optional)	This message is sent from the RU (train responsibility) to IM (control responsibility) to indicate, that the train has started its journey. This message is optional unless agreed to IM/RU.

5.6.2 Outlying Companies and Risk Reduction

The distribution curve shows that 62% of the IMs and 98% of the RU respondents will be ready to implement the function in 2018. The outlying companies are ADIF, CFR Infrastructure, DB Netz, Refer and SZ Cargo.

It appears as if this function (and supporting messages) is tied directly to the full implementation of the TID and there was no phased or interim solution offered at this time. This function must be harmonized during the consolidation phase.

Within the working groups it was already concluded that the optional messages may not be used at all. For Train Ready the working group proposed to use the Train Ready function within GSM-R if offered by an IM. This should be included in the content of bilateral agreements. For example, for several years, DB Netz has offered the Train Ready Function by GSM-R (approved by NSA). Additionally, DB Netz has already implemented Train Composition (train data) using existing UIC message 2201 according UIC-leaflet 407-1.

5.7 Realisation of the Train Running Function

Function Type	Milestone
Target Implementation Milestone – Train Running	2017
Target Implementation Milestone – Service Disruption	2018
Target Implementation Milestone - Enquiries	Implemented on a voluntary basis
Impact	IM and RU

This function concerns the set of messages concerning with the Train Running, Service Disruptions and Enquiries Functions.

Train Running

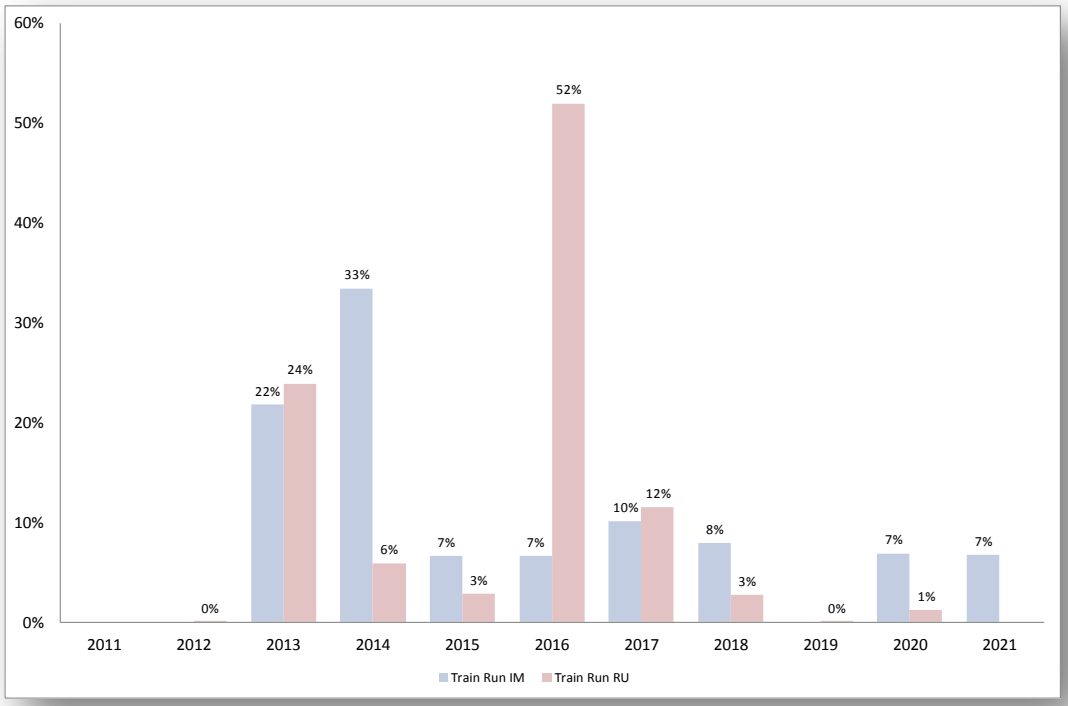


Figure 9: Train Run Company Response

Service Disruption

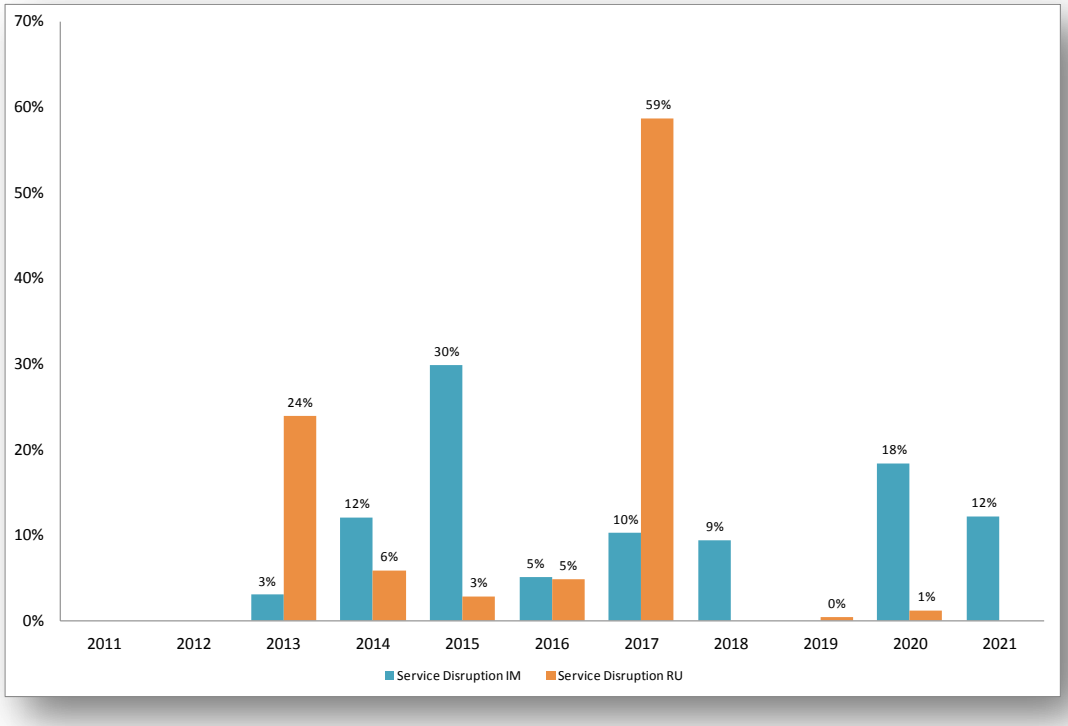


Figure 10: Service Disruption Company Response

5.7.1 TAF-TSI requirement:

While developing the guidelines for this function, Working Group 2 decided to group the TAF-TSI messaging functions for Train Running and Service Disruption into one superset. It is comprised of individual processes and messages as found below in this chapter.

This information exchange between RUs and IMs always takes place between the IM in charge and the RU who has booked the path on which the train is running.

If information is included in a mandatory TAF-TSI message from the IM, then the IM is not obliged to provide this information by any other means.

The data exchange during the running of a train in the case of normal operation is presented in the Train Running Forecast and messages concerning exceptions are defined in Service Disruption Information. Tracing information about train a location is defined in Train Location.

All these messages are exchanged between RU and IM, and are based on trains. The TAF-TSI processes described within the guideline specify in more detail the data exchange needed between the partners involved in interoperable traffic during the train run.

The requirements for Traffic Operation and Management specified in the OPE TSI were taken into account where applicable.

The processes are mostly relevant for the functional and technical development of Company IT applications for information exchange and have little influence on the national operational business processes.

5.7.1.1 Train Running Information message

Once the train arrives, runs-through or departs at/from a reporting point, relevant train running information must be provided.

If the train is handed over between the IMs, for the first IM the process of train running is finished and for the second IM the process of train running is starting at the beginning, therefore with sending the first train running information and all relevant forecasts for its network.

This process is repeated for each involved IM until the final destination has been reached.

5.7.1.2 Realisation of the Train Forecast message

After the departure of the train from the origin station, or after taking over the train from the previous IM at the handover point, the IM in charge sends the Train Running Forecast for the handover point to the next IM. All relevant forecasts are also reported (for the handover, all interchange, handling and reporting points relevant for forecast) on its network to the RU who has booked the path on which the train is running (named “contracted RU”). In addition these forecasts could be sent before the planned departure of the train from the original station or from handover point if such information is available to the IM and IM has a process in place to do it. In the case of ETI (Estimated Time of Interchange), the RU transfers this message to the next RU and additionally to the Lead RU (LRU) for the transport – if there is one and if this is defined in the cooperation contract between RUs. In the case of ETH (Estimated Time of Handover), the IM receiving the forecast for the handover point from the previous IM may take this forecast as a basis for calculating the forecasts for its own network.

In case the train has an additional delay above a certain threshold (according to the contract between IM and RU) an update of the previously sent forecasts must be sent.

5.7.1.3 Delay Cause message

This information was originally included in the Train Running Information Message, but as this message is sent in real time when the cause of the delay is usually not yet known at the time of transmission. Therefore a separate message was proposed as it is already practice according UIC leaflet 407-1

This message is issued by the IM to the contracted RU as soon as reasonably possible to provide the cause of an additional delay in a train’s journey. In one message only one delay event in a specific reporting point and only one delay cause should be reported. Messages should be sent at the moment when the code for a delay is specified and always when the code is changed. If the national system codes the delay automatically at the moment it happens with the default code, e.g. 00, this should not be sent. Only the codes consistent with the coding in the new UIC Leaflet 450-2 should be reported.

In this message every delay should be reported - not only those happening at the reporting location. Delays occurring at points not included in reference file will be shifted to the next reference file point.

In case the cause of the delay is changed (but the delay duration stays the same), the updated message with the new delay code and status alteration will be sent. In case the original delay time is changed (e.g. split of delay into more causes) the deletion of original message must be sent and new messages with the new codes must be sent.

5.7.1.4 Realisation of the Service Disruption Function

This process describes the function of handling any service disruptions that could occur on the IM's network. The TAF-TSI provisions are not very detailed and the way to understand them is very flexible. In order to make the process viable and to be able to fulfil the TAF-TSI requirements, many additional activities were added.

Following the national regulations, after the IM learns about a disruption (either directly or through the RU), it first informs the relevant external bodies (such as emergency medical services, fire-fighters, etc) if needed. After that, the IM analyses the disruption and its consequences and identifies the trains affected by this disruption. Although these activities are not part of the TAF-TSI, they have to be added to the process in order to ensure a logical relation between all activities.

If the train is stopped due to the disruption and no forecast of its further run is yet available, the Train Running Interrupted messages must be sent. According to the national IM rules, each IM may apply a different threshold beyond which the Train Running Interrupted message must be sent (different duration of analyses of the disruption and its consequences) or a different threshold for identifying the interrupted trains (a delay above a certain threshold may be considered as an interruption as well). These thresholds must be agreed in a contract between IM and RU.

Train Running Interrupted messages serve to inform the RU that its train run has been interrupted and a forecast for its further run is not yet possible. The message is the trigger to inform and agree together with the RU (and the next IM if relevant) a solution on how to solve the problem. There are several options, for example:

1. Delaying the train – the train will wait until disruption has been solved and then will continue as originally planned but with a delay. The accepted value of the delay depends on the negotiation between IM, RU and the next IM and on the situation at the national level. If this solution is taken, the updated Train Running Forecast messages are sent and the process of Train Running continues.
2. Cancellation of train run by RU – due to the disruption, the RU may decide to cancel the train run as it is. In this case, the train will be deleted from the system and will be changed into the set of wagons and locomotives. Afterwards, the RU may distribute the wagons into other trains or may create a new train, but this will then be handled according to other processes. So the process of Service disruption for this train will be ended.
3. Rerouting of train – train will be rerouted, which may lead to the cancellation of the whole or just part of the original path. The relevant processes (path alteration, path cancellation or new path negotiation) will follow.

Applying standard business rules, the IM operating the network should consult and negotiate a possible solution with the affected RU and the next IM. However the final decision is taken by the IM, except train in the case of train cancellation by the RU.

The message to be implemented is found below:

5.7.1.4.1 Train Running Interrupted Message

This message is issued by the IM to the neighbouring IM and to the RU that has contracted the path if the train run is interrupted. This message is sent only for those trains that are directly interrupted by the disruption and for which a further run cannot be forecasted. For all other trains, only the new forecast is sent and all the other actions are handled at the operational level following national rules and agreements.

The Train Running Interrupted message will be treated only as information about the interruption of a single train run.

However, it is possible for a single IM to adapt the message to be used also for multiple trains. But this is left to a decision of a single IM and is not being harmonised or regulated at the TAF-TSI level.

If the disruption happens a location not registered the reference file, it will be allocated to the next known location in the reference file. The exact location where the disruption happened may be specified as well but only using the free text field.

The possible cause may not be known at the time of transmission, therefore may not be conveyed. However, whenever possible the UIC Leaflet 450-2 coding (the same coding as used for the Delay cause) should be used.

5.7.1.5 Realisation of the Train Enquiries Function

As all information included within enquiry messages is passed via push messages, the enquiry function is optional. An IM may decide if the function will be provided as a service. The usage of enquiry message must be agreed between the contract partners or to be stated in Network Statements.

The train enquiry messages may be sent by the RU to the IM with whom it has contracted a path. After receiving the enquiry, the IM will send the appropriate response message. Only the contracted RU could enquire about the train – the basis is the path contract (company ID from path details).

If the RU sends an invalid enquiry, the IM is not obliged to send an answer, but may send the Answer not Possible or Inadmissible message.

According to the TAF-TSI, the response time for enquiries must be less than 5 minutes (from time of receiving to time of sending).

The consensus is not to implement the enquiry function as all the information should be sent as push messages for Train Running, Train Forecast and Train Delay Cause.

5.7.1.5.1 Train Delay Performance message

This message is issued following receipt of an enquiry about the train delay performance. It delivers a report of all the actual delta t values concerning a specified train at all reporting points within network of particular IM and causes of all additional delays.

There are two main parts in the message:

1. Train Location report – consisting of the list of all the actual delta t values in all reporting stations (Handover, Interchange, Handling and Reporting points).
2. Delay event report – consisting of the list of all the delay events (additional delays). If no delay is recorded this report does not have to be made. In this report every additional delay should be reported – not only those happening at the reporting location but also those occurring at points not included in the reference files. Additional delays occurring at points not included in reference files will be shifted to the next reference file point. All the delay causes should be reported. If the national system codes the additional delay automatically at the moment it happens with the default code, e.g. 00, or if the code 00 is used to specify that the cause is not known, these cases should not be reported. Only the codes consistent with the coding in the new UIC Leaflet 450-2 should be reported.

5.7.1.5.2 Train Forecast at Reporting Location Message

This message is issued following receipt of an enquiry about train forecasts at a particular reporting location.

This message should consist of all the forecasts for all the trains moving towards a specified location within the requested time frame, if specified in the enquiry.

In the answer message, only the trains for which the forecast at the time of requesting is available and that have not yet passed this point will be reported. If train running information is already available for the point, the forecast is not relevant anymore and therefore should not be reported. The forecast for trains which have already started to run but are not yet present on the network of the relevant IM may also be reported depending on whether the IM is calculating the forecasts for their network based on the ETH received from the neighbouring IM.

To avoid the situation where one IM will have to include forecasts for hundreds of trains in its response, the choice regarding how many trains may be included in the answer to this message should be left open for each single IM. The number of trains should be based on the agreement between IM and RU. It may be defined via the thresholds values in Requested time frame or it may be done by stating the maximum number of trains to be included in one report. The way of limiting the number is left to a decision at the national level.

5.7.1.5.3 Answer not possible or inadmissible message

This message may be used by the IM in case the Enquiry message cannot be answered. For example, if the RU is enquiring about a train which is not known to the IM, or which has not yet entered the network of an IM, the IM cannot send any of the messages that exist so far. Therefore a new optional message (Answer Not Possible), where the reason for not answering can be explained, is needed.

5.7.2 Outlying Companies and Risk Reduction

5.7.2.1 Train Running

The distribution curve for the Train Running Function and suite of messages shows that 73% of all IM and 95% of all RU respondents will be ready for implementation by 2017. The outlying companies are ADIF, B-Logistics, CFR Infrastructure, CP Carga, Network Rail, Refer and SZ Cargo.

It was noted by several of these outlying companies that they have existing systems that support this function and that the Common Interface may be configured to generate TAF-TSI compliant messaging until the function is fully realised. Many companies are reporting that they will be able to realise the function earlier without a full implementation.

5.7.2.2 Service Disruption

The distribution curve for the Service Disruption Function and suite of messages shows that 82% of IM and 95% of RU respondents will be ready to realise this function by 2018.

The outlying companies are ADIF, CFR Infrastructure, CP Carga, DB Netz, Refer and SZ Cargo. The Service Disruption function in these instances is clearly dependent on the realisation of the TID. It was noted that several of these outlying companies have existing systems supporting this function and that translation may be used to generate TAF-TSI compliant messaging until the function is fully realised.

5.7.2.3 Enquiries

The data for the enquiry function was not reliable, as most respondents used the default implementation dates in the template. It was determined during the development of the Implementation Guides that this function is not necessary, since

the Train Running information is a ‘push’ architecture. However, to be customer friendly, some Infrastructure Managers wanted to leave the option open to accept enquiries.

Therefore, implementation of the Enquiry and Response messages will be based on bi-lateral agreements and not obliged by the Master Plan.

5.8 Realisation of the Consignment Data Function

Function Type	Milestone
Target Implementation Milestone	2017
Impact	IM and RU

This is an RU function, however there are some IMs that will realise this function on behalf of their customers. This is why there is an IM response included. Additionally, the RU community has started up a new working group to align this function with the Electronic Consignment Note used for both CIM and SMGS...

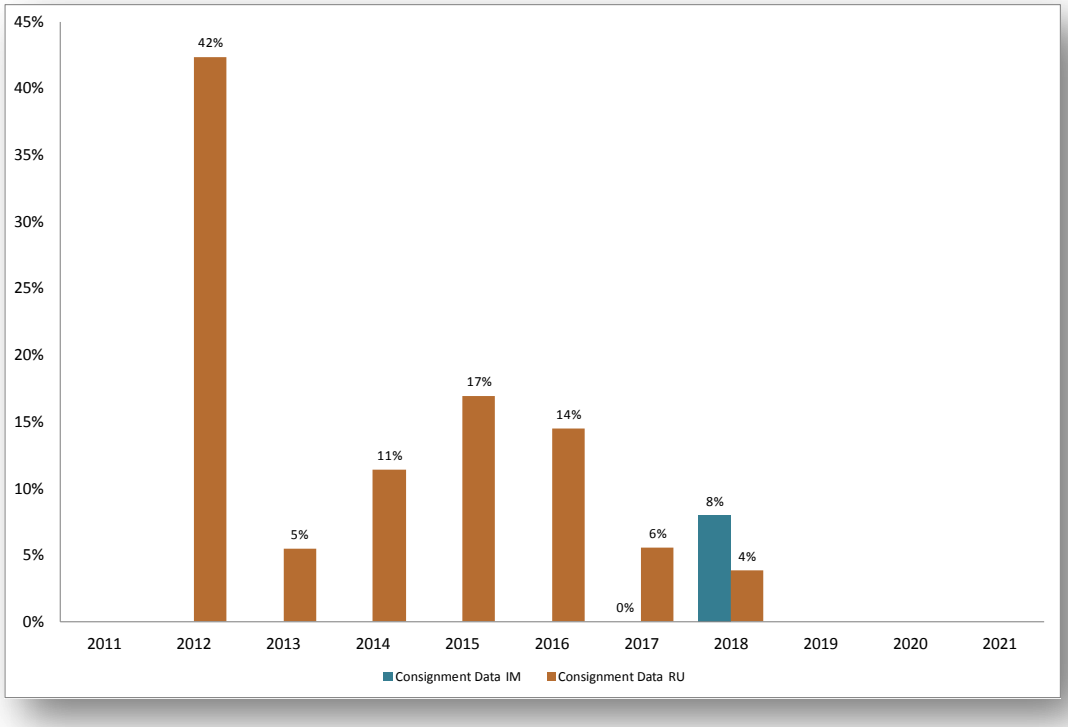


Figure 11: Consignment Data Company Response

5.8.1 TAF-TSI requirement:

The wagon order is essentially a subset of the consignment note information with added route and wagon-related information. It must be issued for both loaded and empty wagons by the LRU to the RUs involved in the transport chain.

The wagon order must include all relevant information required by an RU for transportation under its responsibility until transfer to the next RU. The content is therefore aligned to the role of the RU - origin, transit or delivery RU in the transport chain.

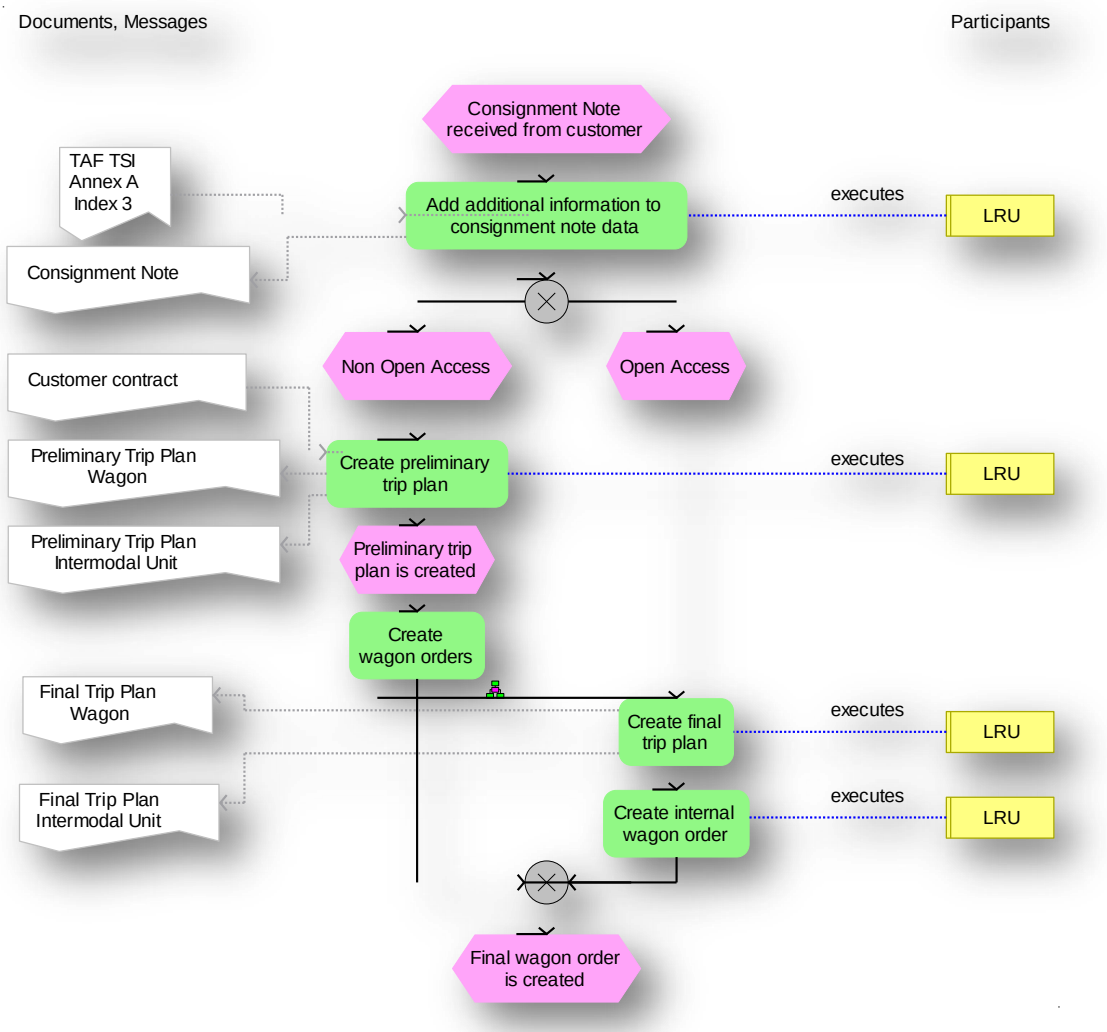
This gives three different types of wagon order in TAF-TSI depending on RU role:

- Wagon order for the origin railway undertaking (ORU)
- Wagon order for the transit railway undertaking (TRU)
- Wagon order for the delivery railway undertaking (DRU)

The process of wagon order creation includes the following actions:

Process	Description
Create preliminary trip plan	A trip plan must be created when at least one other RU is involved. As part of transport planning, the LRU creates a preliminary trip plan which is amended/modified incrementally in the following processes (see below). Note: TAF-TSI does not define the contents or the structure of the trip plan ("For wagons or intermodal units; shows the planned trip for a wagon or intermodal unit", TAF-TSI legal text glossary).
Create wagon orders	This action includes the issuing of wagon orders for individual transport sections to other RUs. It is detailed in Figure 6. After completion of the action, the final trip plan is available and the wagon orders named above have been issued by the LRU.
Create final trip plan	This action is run for open network access in which the LRU carries out transportation alone. In this case, the issuing of wagon orders to other RUs is not necessary in TAF-TSI. The preliminary trip plan is thus also the final trip plan.
Create internal wagon order	The LRU creates an internal wagon order for its own production.

The associated process is shown in the following figure.



The refinement of action “Create Wagon Orders“(see above), performed for non-open network access (no further RUs involved in transportation), includes the following actions:

Determine RUs to be contacted	The LRU determines the other RUs to be contacted for that transportation.
Create preliminary wagon orders	This action includes the issuing of preliminary wagon orders for individual transport sections to other RUs. The RUs take on one of the following roles here: • Origin railway undertaking (ORU) • Transit railway undertaking (TRU) • Delivery railway undertaking (DRU) Note: It is not apparent in the description of TAF-TSI in which form and over which path the preliminary wagon order is issued to the RU.

Determine handover times at interchange points	Each commissioned RU uses the preliminary wagon order to determine the forecasted handover time (ETI) to the next RU (the ORU the handover time to the TRU, the TRU in turn to a following TRU or to the DRU) and conveys this to the following RU and LRU. The calculation of the ETI is based on the ETI which an RU (with the exception of an ORU) has received from the previous RU. The DRU then calculates the forecasted time of arrival (ETA) and communicates this to the LRU.
Check availability of resources and path	The RUs that have received a preliminary wagon order from the LRU check their availability of resources and paths. They provide appropriate feedback to the LRU. Note: It is not apparent in the description of TAF-TSI in which form and over which path feedback is provided to the LRU.
Create final wagon orders	The wagon orders are created accordingly for the respective partner RUs (depending on transaction) and sent to them using the TAF-TSI message provided: • Wagon order "WagonOrderToORU" for the origin railway undertaking (ORU) • Wagon order "WagonOrderToTRU" for the transit railway undertaking(s) (TRU) • Wagon order "WagonOrderToDRU" for the delivery railway undertaking (DRU) The contents of these messages also form the basis for short-term path requests if required to execute the freight order. Where applicable, the LRU also passes an internal wagon order to its own production.

5.8.2 Outlying Companies and Risk Reduction

The distribution curve shows that over 90% of the RU respondents indicated that they would implement the Consignment Data function by 2017. The outlying RU is Green Cargo and the Infrastructure Manager is MAV, who will be implementing this function on behalf of their customers.

It was noted that the entire consignment process was not adequately described in the TAF-TSI; therefore it was difficult to assess what impacts it would have. It should be noted that the Wagon Order is currently being generated by current systems and can be supported in a TAF format with proper translation.

Additionally, many responded that they would be relying on the existing ORFEUS system to realize this function.

5.9 Realisation of the WIMO Function (4.2.12.2)

Function Type	Milestone
Target Implementation Milestone	2016
Impact	IM and RU

This is an RU function, however there are some IMs that will realise this function on behalf of their customers. This is why there is an IM response included.

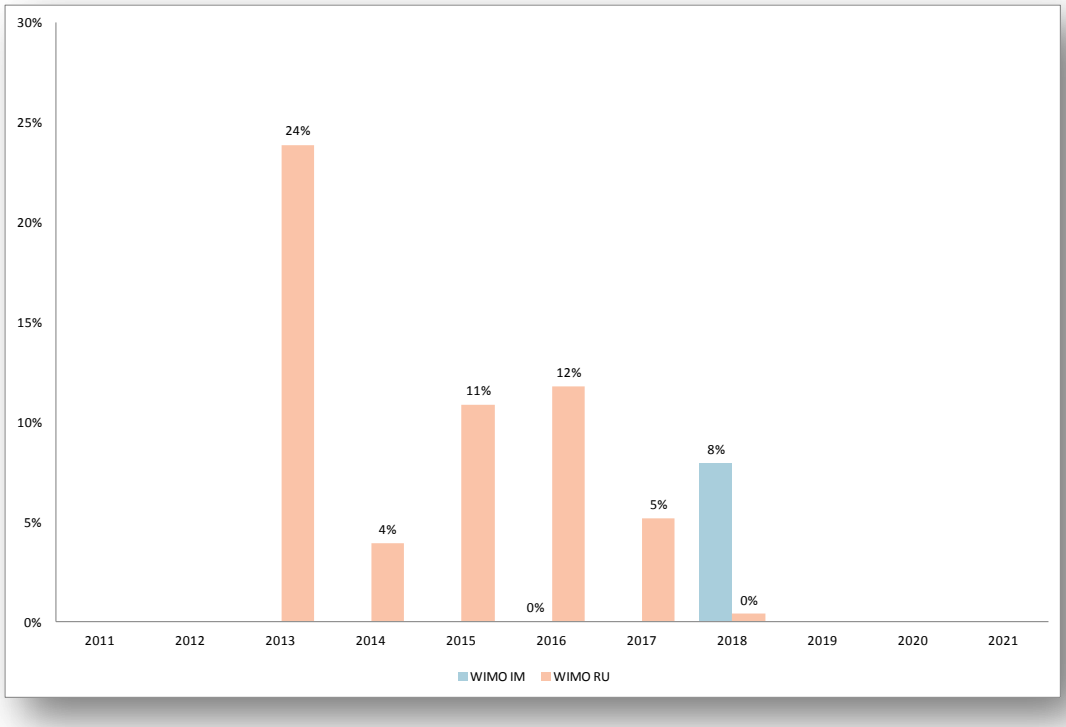


Figure 12: WIMO Company Response

5.9.1 TAF-TSI requirement:

This function was originally defined in the SEDP for implementation in **Phase I, 2010.**

For those involved in transport, TAF-TSI stipulates the keeping of an operations database for wagon and intermodal units (WIMO). This database may be either maintained locally (via peer-to-peer messaging) or centrally.

Each Railway Undertaking must be able to SEND, RECEIVE and STORE the appropriate information using the TAF-TSI defined messaging and processes.

All information on the operating RU must be entered into this operations database (operative system), such as that pertaining to wagon movements. This is therefore the "heart" of the RU and is necessary for running the company's operations. Derived or processed from this data management is information that, according to TAF-TSI, must be made available over the common interface to the other parties involved. Because this is operative data storage for the rendering of a transport service, it is only decentralized at each operating RU. The messages provided in TAF-TSI are used for communication.

The movement data for a wagon or intermodal unit in the database is created at the latest when the customer transfers a release time for the wagons/intermodal units.

This release time is the first movement data entry for a current wagon/wagon journey. The subsequent information on train movements sent mainly with Wagon Movement messages, results in appropriate updates.

With this, the WIMO shows the movement of a wagon and an intermodal unit from the departure point to the final delivery on the recipient's siding with forecasted handover time (ETI) and actual times at the different stations to the final delivery time (forecasted arrival time (ETA)) at the wagon recipient.

As currently defined in the regulation, rolling stock operating data are also part of the WIMO. This data includes all temporary rolling stock data, such as restrictions, on-going and scheduled maintenance work, mileage and fault counters.

The operating rolling stock data must be accessible by all authorized users on his/her authorization level using a single key specified by the wagon ID (wagon number).

The following messages must be exchanged:

TAF Ref	Message	Description
4.2.8.6	WagonException	This message is used by the RU/Service Provider to inform the Lead RU about deviations e.g. bad order, hold.
4.2.9.5	WagonRefusedAt Interchange	This message is used by the neighbouring RU/Service Provider as answer to the message “WagonInterchangeNotice” to inform the sender of the WagonInterchangeNotice the responsibility for the wagon is refused.
4.2.8.8	WagonArrivalNotice	This message is used by the last RU/Service Provider in the transport chain to inform the Lead RU that the wagon has arrived at its yard
4.2.8.9	WagonDeliveryNotice	This message is used by the last RU/Service Provider in the transport chain to inform the Lead RU that the wagon has been placed at the consignee’s siding.

5.9.2 Outlying Companies and Risk Reduction

Not all companies responded to this function, therefore the analysis is difficult to assess. The distribution curve shows that over 50% of the RU respondents indicated that they would implement the WIMO function by 2016. The outlying RUs are CP Carga, GYSEV and SBB Cargo and the Infrastructure Manager is MAV, who will be implementing this function on behalf of their customers.

It was noted that the function was not adequately described in the TAF-TSI; therefore it was difficult to assess what impacts it would have. It should be noted that the WIMO functions are supported by current systems and can currently be supported. Additionally, many responded that they would be relying on the existing ISR system to realize this function.

5.10 Realisation of the Wagon Movement Function

Function Type	Milestone
Target Implementation Milestone	2016
Impact	RU

This is an RU function, however there are several IMs that will realise this function on behalf of their customers. This is why there is an IM response included.

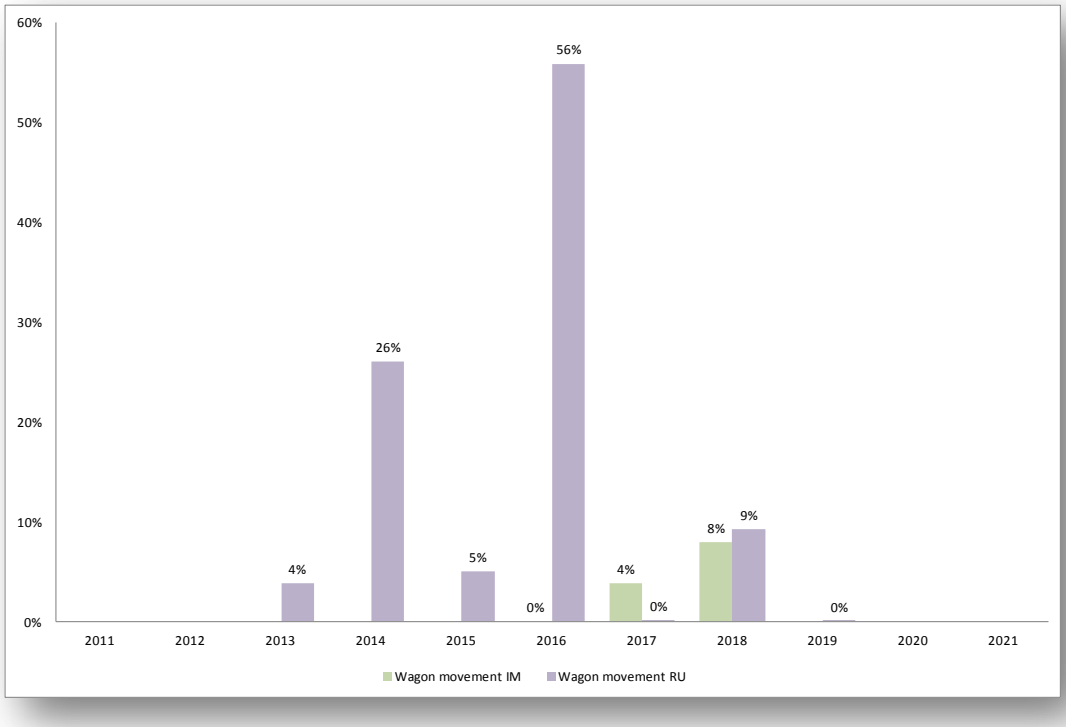


Figure 13: Wagon Movement Company Response

5.10.1 TAF-TSI requirement:

For the reporting of the movement of a wagon, the following data must be stored, sent and received by the WIMO.

TAF Ref	Message	Description
4.2.8.2	WagonReleaseNotice	This message is used by the Lead RU – for the case, that the LRU is not the first RU in the Transport chain - to inform the RU in charge, that the wagon is ready to be pulled.
4.2.8.3	WagonDeparture Notice	This message is used by the RU in charge to inform the LRU, that the wagon has been picked-up (pulled) and has reach the RU's Yard of departure. This message is the response to the "WagonReleaseNotice".
4.2.9.2	WagonInterchange Notice	This message is used by the RU/Service Provider to ask the neighbouring RU/Service Provider the acceptance of the responsibility for a wagon.

TAF Ref	Message	Description
4.2.8.4	WagonYardArrival	This message is used by the RU to inform the LRU, that the wagon has arrived at its yard
4.2.9.3	WagonInterchange SubNotice	This message is used by the RU/Service Provider to inform the IM, that the responsibility is handled over to the next RU/Service provider.
4.2.8.5	WagonYardDeparture	This message is used by the RU/Service Provider to inform the Lead RU that the wagon has left the yard
4.2.9.4	WagonReceived_At Interchange	This message is used by the neighbouring RU/Service Provider as answer to the message “WagonInterchangeNotice” to confirm the acceptance of the responsibility for the wagon.
4.2.12.2	Wagon and Intermodal Unit Operational Database	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.
4.2.8.6	WagonException	This message is used by the RU/Service Provider to inform the Lead RU about deviations e.g. bad order, hold.
4.2.9.5	WagonRefusedAt Interchange	This message is used by the neighbouring RU/Service Provider as answer to the message “WagonInterchangeNotice” to inform the sender of the WagonInterchangeNotice the responsibility for the wagon is refused.
4.2.8.8	WagonArrivalNotice	This message is used by the last RU/Service Provider in the transport chain to inform the Lead RU that the wagon has arrived at its yard
4.2.8.9	WagonDeliveryNotice	This message is used by the last RU/Service Provider in the transport chain to inform the Lead RU that the wagon has been placed at the consignee’s siding.

5.10.2 **Outlying Companies and Risk Reduction**

The distribution curve shows that over 80% of the RU respondents indicated that they would implement the Wagon Movement function by 2016. The outlying RUs are CP Carga, GYSEV, Green Cargo and SBB Cargo. The Infrastructure Managers are MAV and Network Rail, who will be implementing this function on behalf of their customers.

It was noted that some process definitions are lacking and that there are certain risks because of dependencies on third parties. However, most of the wagon movement functions are currently implemented and can be realized earlier by utilizing translation to TAF-TSI compliant messaging.

5.11 Realisation of the Shipment ETA Function

Function Type	Milestone
Target Implementation Milestone	2018
Impact	RU

This is an RU function, however there are several IMs that will realise this function on behalf of their customers. This is why there is an IM response included.

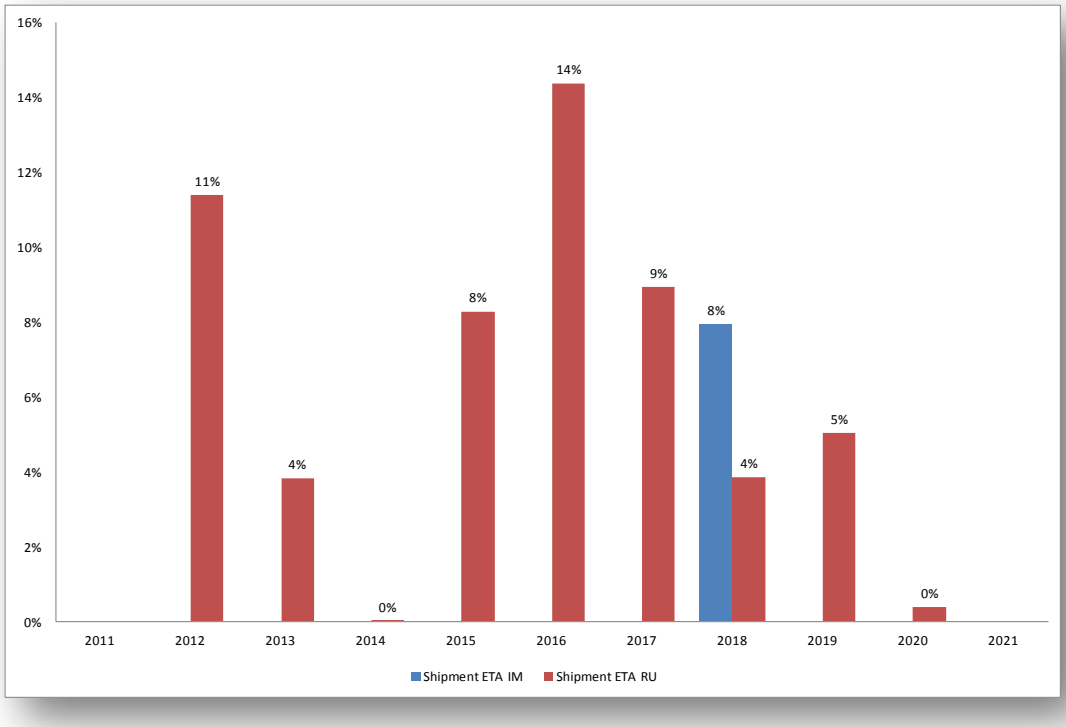


Figure 14: Shipment ETA Company Response

5.11.1 TAF-TSI requirement:

ETA for the shipment is the most important information for a customer.

The ETA for the Wagon must be sent to the LRU. The ETA must be electronically stored along with wagon movement. For each wagon the Lead RU must establish/update a wagon trip plan

The Shipment ETA Function reflects a coordinated and coherent implementation at the end of the Master Plan realisation. Due to the enormous effort involved in the realisation coupled with the dependence on earlier functions, this function is well-coordinated and consistent across the industry. Much of the effort will depend on a coordinated trip planning approach.

Trains often transport the wagons of different customers. For every wagon, the LRU must create and maintain a trip plan conforming to train paths and train level. New train paths for a train, such as in the event of traffic disruption, result in new trip plans for the wagons in question. The time of creation of the trip plan is on receipt/acceptance of the order from the customer.

The trip plan for the wagon must be stored in a database at every LRU. This information must be made available over the common interface to others involved.

The following functions and messages must be realised to support the ETA and Trip Planning processes:

TAF Req	Message/Process	Definition
4.2.12.2	Trip plan for wagon / Intermodal unit	The Wagon Trip Plans must be stored by each LRU in a database.
4.2.12.2	Wagon Trip Plan Databases	Wagon Trip Plans must be stored by each LRU in a database.
4.2.8.7	WagonException ReasonETI_ETA_Request	Specified as the Wagon Exception message New ETI/ETA Request. This message is used by the Lead RU to inform the other RU/Service providers about deviations and to request a new ETI / ETA.
4.2.7.3	WagonETA/ETI Message	This message can be used to send predetermined or manually generated ETI and ETAs in phase III. For phase IV, this message is sent by the RU to the next RU in the transport chain to give him the calculation of its ETI. The last RU sends this message with ETA to the Lead RU, which may inform its customer. Following the handover information from the IM, the RU sends with this message also the updated ETI to the next RU and the last RU sends the updated ETA to the LRU.

5.11.2 **Outlying Companies and Risk Reduction**

Not all companies responded to this function, therefore the analysis is difficult to assess. The distribution curve shows that over 50% of the RU respondents indicated that they would implement the Shipment ETA function by 2018. The outlying RUs are CP Carga, and SBB Cargo and the Infrastructure Manager is Network Rail, who will be implementing this function on behalf of their customers.

5.12 Realisation of the Rolling Stock Reference Database

Function Type	Milestone
Target Implementation Milestone	2015
Impact	RU and Keeper

Not all RUs reported on the implementation of the RSRD2, however a report was received from the Private Wagon Owners stating the database currently being developed (RSRD2) would be implemented and populated by all participating companies by the end of 2013 at the latest. These users represent 76% of all of the private wagons registered in the GCU database.

The graphic below represents those RUs and Keepers who reported directly to the Deployment Team.

5.12.1 TAF-TSI requirement:

The keeper of a rolling stock is responsible for the storage of the 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 and must contain all items for:

- identification of rolling stock,
- assessment of the compatibility with the infrastructure,
- assessment of relevant loading characteristics,
- brake relevant characteristics,
- maintenance data,
- environmental characteristics.

The Rolling Stock Reference Databases must allow easy access (a single common access provided via the common interface) to the technical 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 (IMs, RUs, logistic providers and fleet managers) in particular for purposes of fleet management and rolling stock maintenance.

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

5.12.2 Outlying Companies and Risk Reduction

The distribution curve shows that a majority of the RU respondents indicated that they would implement the Rolling Stock Reference Data function by end 2013 by using the RSRD2 database. However, for those fleet owners not using the database, the date has been fixed at 2015 to be inclusive of all those who have responded. This presents minimal risk, as there is no dependency with any other function.

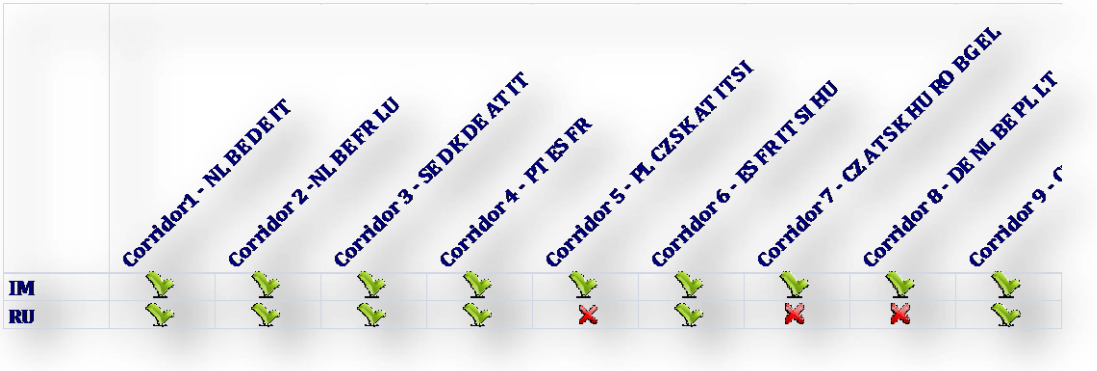
During the consolidation phase of the Master Plan, more RUs (as fleet owners) shall be contacted to provide further information on their implementation plans.

6 Corridor Analysis

The Corridor analysis overview indicates the latest implementation date by all participants in a specific Corridor. As the Corridor Regulation specifically addresses Short Term Path Requests and Train Running Information, these are the functions shown in the graphs.

Basically the TAF implementation is company-related (responsibility of each company to realize the functions based on their capabilities) and not specifically corridor related. Furthermore, the corridor approach is significantly driven by the realisation from the Infrastructure Managers; therefore only their planning is reflected in the graphs. It can be argued that once an IM has implemented the TAF-TSI, their part of the corridor is also implemented. Once a RU has implemented its Master Plan this RU should be able to operate TAF-TSI compatible on all corridors. It is clear that the RU community will be ready for implementation in 2018 for all functions.

Please note that all participants may not be reporting in all corridors. The graphic below illustrates that enough responses have been received to do a quality analysis on the corridors with the exception of Corridors 5, 7 and 8. This is due to insufficient responses by the major participants in these corridors. Although each RU is able to operate on each corridor this analysis takes into account those RU that are expected to be the “main operator” on a specific corridor related to their geographical activities of today.



This corridor analysis will be passed to the Corridor Managers for further coordination during the Consolidation Phase, where the functions will be more thoroughly analysed.

6.1 Corridor 1 (NL, BE, DE, IT)

The following companies have reported in this corridor:

Companies
CaptrainIT
CEMAT
DB Netz
DB Schenker Rail (NL)
DB Schenker Rail Deutschland
HUPAC-IT
Infrabel
Mitteldeutsche Eisenbahn
Nordcargo SRL (IT)
ProRail
RBH Logistics (DE)
RFI
SNCB Logistics
Trenitalia

Corridor 1 is missing information from KeyRail, who is the major Dutch Infrastructure Manager in this corridor.

The later IM implementation dates for Path Requests are dependent upon a full implementation of the TID. However, it has been confirmed that these functions can be implemented sooner based on current data exchange (e.g. PCS) without the full implementation of the TID. This approach could provide a practical implementation of the function at an earlier date.

In order to reduce risk of a late implementation, a general implementation strategy could be to use PCS (path Coordination System) for international trains in the beginning and then to connect the national planning systems to PCS. PCS shall be able to use the TAF-TSI Messages and the CI therefore making the function TAF-TSI compliant.

DB Netz, for instance has stated that their development of the interface to PCS and the adaption of company system shall be done at the latest before end of 2015 to be used for the TT period 2016. For national trains, the path order tool “Trassenportal” with an xml interface is in place and is used by majority of the market.

It is apparent from the responses that the final implementation is dependent on the new transport identifiers (TID, Path ID, Path Request ID, etc.) However the phasing approach can be used along with the existing international applications to realize this function without full implementation of the TID.

6.1.1 **Overview – End Date**

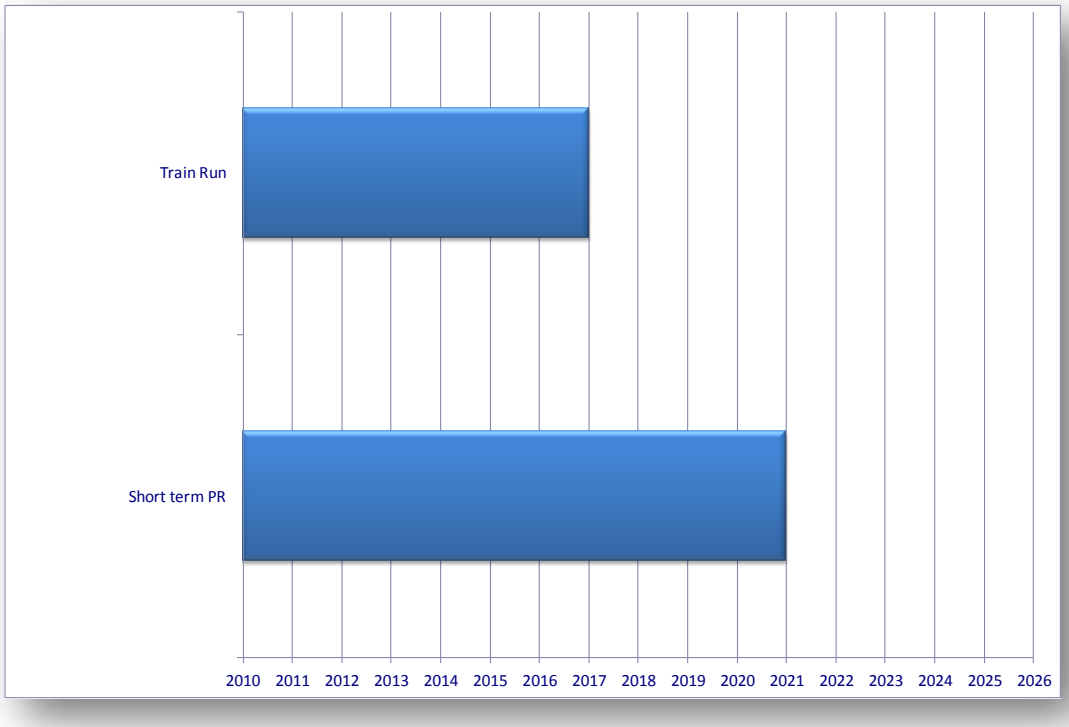


Figure 15 - Corridor 1

6.2 Corridor 2 (NL, BE, FR, LU)

Corridor 2 is missing information from KeyRail, who is the major Dutch Infrastructure Manager in this corridor. The following companies have reported in Corridor 2:

Companies
ACF
CFL cargo
CFL infra
DB Schenker Rail (NL)
EuroCargo Rail SAS (FR)
Infrabel
ProRail
RFF
SNCB Logistics

The later IM implementation dates for Path Requests are dependent upon a full implementation of the TID. However, it has been confirmed that these functions can be implemented sooner based on current data exchange (e.g. PCS) without the full implementation of the TID. This approach could provide a practical implementation of the function at an earlier date.

In order to reduce risk of a late implementation, a general implementation strategy could be to use PCS (path Coordination System) for international trains in the beginning and then to connect the national planning systems to PCS. PCS shall be able to use the TAF-TSI Messages and the CI therefore making the function TAF-TSI compliant.

6.2.1 Overview – End Date

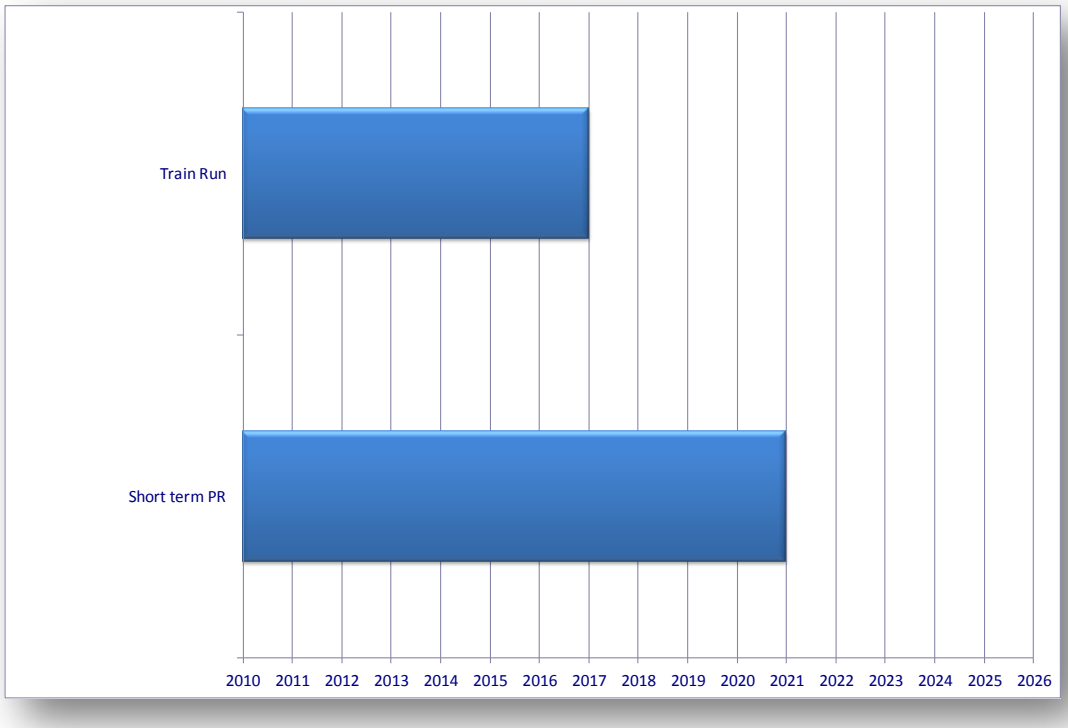


Figure 16 Corridor 2

6.3 Corridor 3 (SE, DK, DE, AT, IT)

The following companies have reported in this corridor:

Companies
BDK
CaptrainIT
CEMAT
DB Netz
DB Schenker Rail Deutschland
DB Schenker Rail Scandinavia (DK)
Green Cargo
Hector Rail
HUPAC-IT
Mitteldeutsche Eisenbahn
Nordcargo SRL (IT)
ÖBB infra
RBH Logistics (DE)
RCA
RFI
Trafikverket
Trenitalia

The later IM implementation dates for Path Requests are dependent upon a full implementation of the TID. However, it has been confirmed that these functions can be implemented sooner based on current data exchange (e.g. PCS) without the full implementation of the TID. This approach could provide a practical implementation of the function at an earlier date.

In order to reduce risk of a late implementation, a general implementation strategy could be to use PCS (path Coordination System) for international trains in the beginning and then to connect the national planning systems to PCS. PCS shall be able to use the TAF-TSI Messages and the CI therefore making the function TAF-TSI compliant.

DB Netz, for instance has stated that their development of the interface to PCS and the adaption of company system shall be done at the latest before end of 2015 to be used for the TT period 2016. For national trains, the path order tool “Trassenportal” with an xml interface is in place and is used by majority of the market.

It is apparent from the responses that the final implementation is dependent on the new transport identifiers (TID, Path ID, Path Request ID, etc.) However the phasing approach can be used along with the existing international applications to realize this function without full implementation of the TID.

6.3.1 **Overview - End Date**

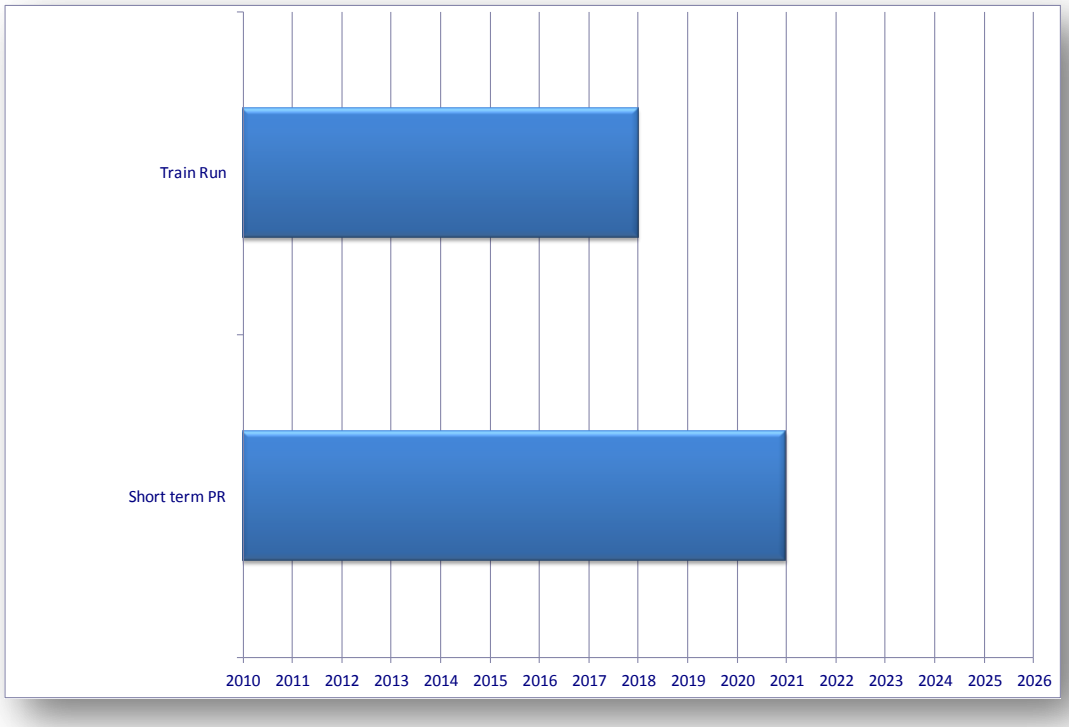


Figure 17 - Corridor 3

6.4 Corridor 4 (PT, ES, FR)

The following companies have reporting in Corridor 4:

Companies
ADIF
CP Carga
EuroCargo Rail SAS (FR)
EuroCargo Real (ES)
REFER
Renfe
RFF
SNCF Fret
Transportes Ferroviarios Especiales (ES)

The outlying company is ADIF and no risk reduction has been identified. The rest of the participants can deliver sooner.

6.4.1 Overview – End Date

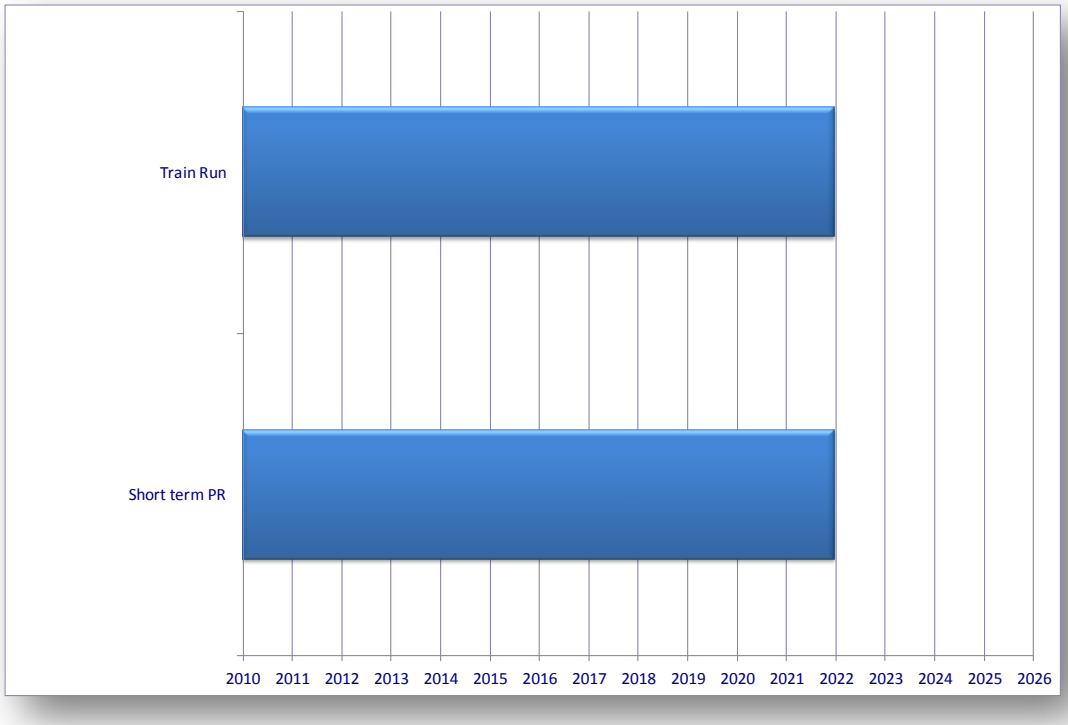


Figure 18 - Corridor 4

6.5 Corridor 5 (PL, CZ, SK, AT, IT, SI)*

The following Companies have reported in Corridor 5:

Companies
CaptrainIT
CD cargo
CEMAT
DB Schenker Rail Polska
HUPAC-IT
Nordcargo SRL (IT)
ÖBB infra
PLK
RCA
RFI
SZ cargo
SZ infra
SZDC
Trenitalia
ZSR
ZSSK

The outlying company is SZ Infrastructure.

6.5.1 Overview – End Date

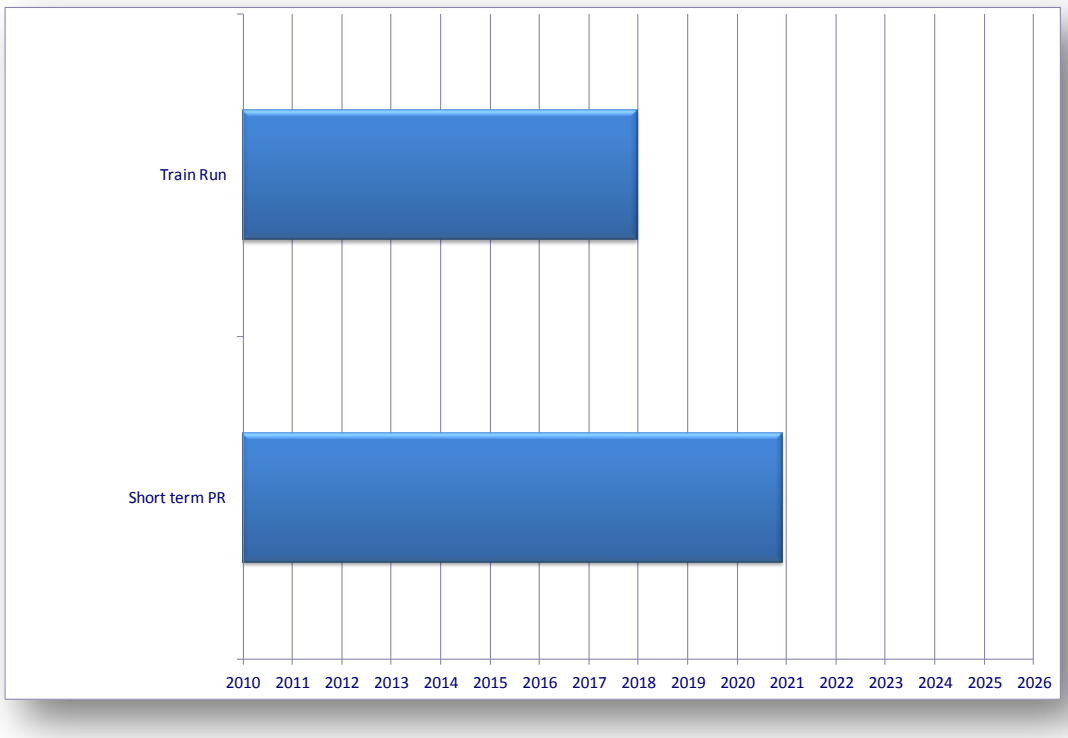


Figure 19 - Corridor 5

*PKP not reporting

6.6 Corridor 6 (ES, FR, IT, SI, HU)*

The following Companies have reported in Corridor 6:

Companies
ADIF
CaptrainIT
CEMAT
EuroCargo Rail SAS (FR)
EuroCargo Real (ES)
Gysev
Gysev Cargo
HUPAC-IT
MAV IM
MMV
Nordcargo SRL (IT)
RCH
Renfe
RFF
RFI
SNCF Fret
SZ cargo
SZ infra
Transportes Ferroviarios Especiales (ES)
Trenitalia
VPE

6.6.1 Overview – End Date

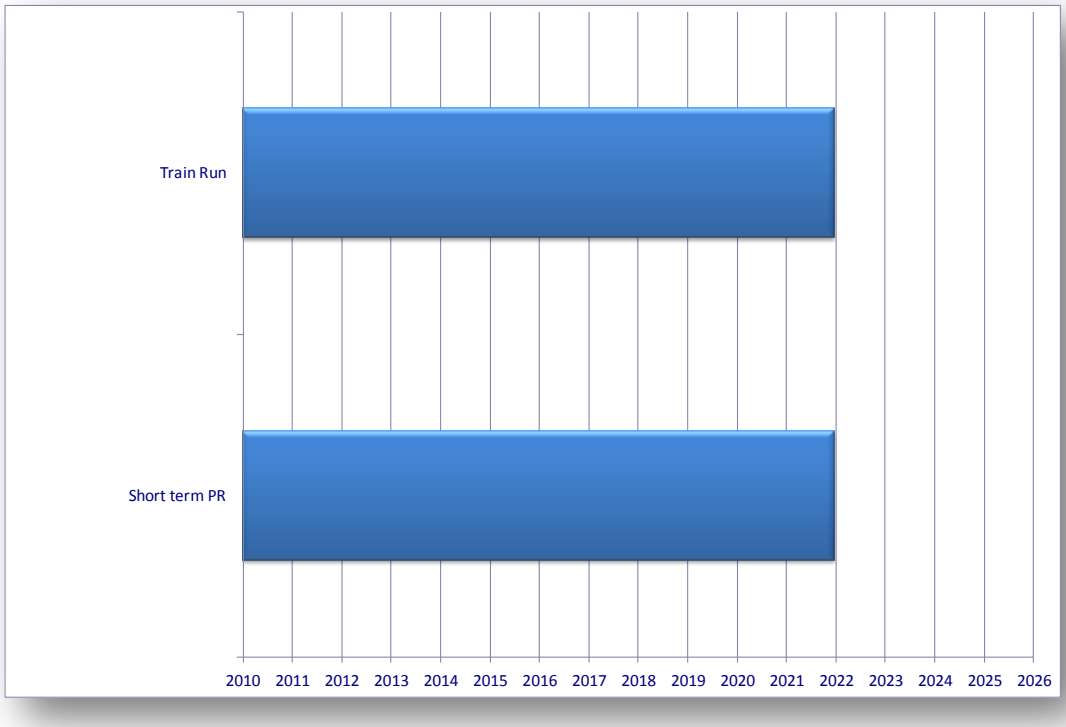


Figure 20 - Corridor 6

6.7 Corridor 7 (CZ, AT, SK, HU, RO)*

The following companies have reported in Corridor 7

Companies
CD cargo
CFR Infrastructure
DB Schenker Rail Bulgaria
DB Schenker Rail Romania
Gysev
Gysev Cargo
MAV IM
MMV
ÖBB infra
RCA
RCH
SZDC
VPE
ZSR
ZSSK

6.7.1 **Overview – End Date**

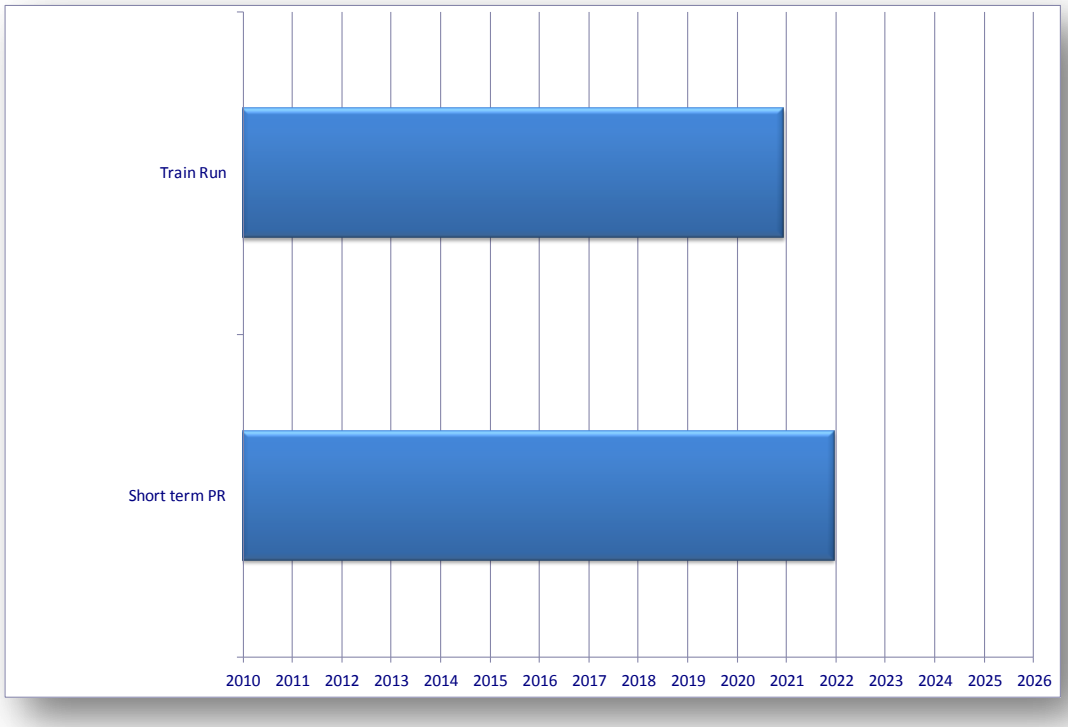


Figure 21 - Corridor 7

*CFR Marfa not reporting

6.8 Corridor 8 (DE, NL, BE, PL, LT)*

KeyRail, the principal Infrastructure Manager for this corridor in the Netherlands has not reported.

The following Companies have reported in Corridor 8:

Companies
DB Netz
DB Schenker Rail (NL)
DB Schenker Rail Deutschland
DB Schenker Rail Polska
Infrabel
Mitteldeutsche Eisenbahn
PLK
ProRail
RBH Logistics (DE)
SNCB Logistics

The later IM implementation dates for Path Requests are dependent upon a full implementation of the TID. However, it has been confirmed that these functions can be implemented sooner based on current data exchange (e.g. PCS) without the full implementation of the TID. This approach could provide a practical implementation of the function at an earlier date.

In order to reduce risk of a late implementation, a general implementation strategy could be to use PCS (path Coordination System) for international trains in the beginning and then to connect the national planning systems to PCS. PCS shall be able to use the TAF-TSI Messages and the CI therefore making the function TAF-TSI compliant.

6.8.1 **Overview – End Date**

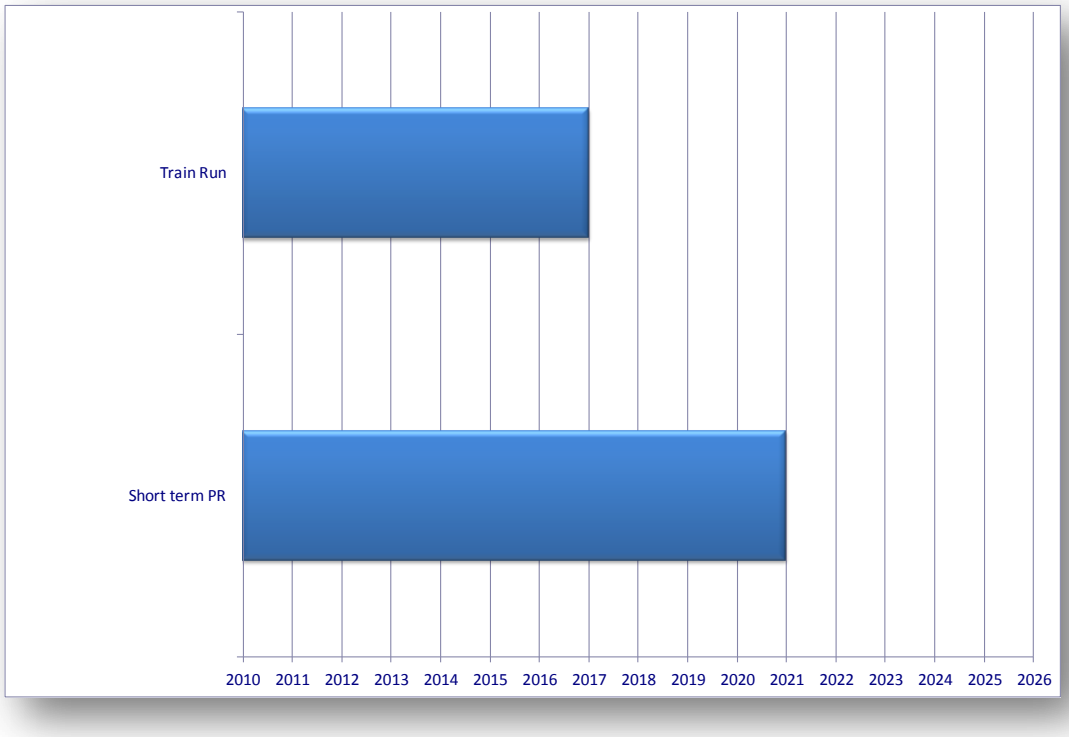


Figure 22 - Corridor 8

*PKP Cargo not reporting

6.9 Corridor 9 (CZ, SK)

The following companies have reported in Corridor 9:

Companies
CD cargo
SZDC
ZSR
ZSSK

6.9.1 Overview – End Date

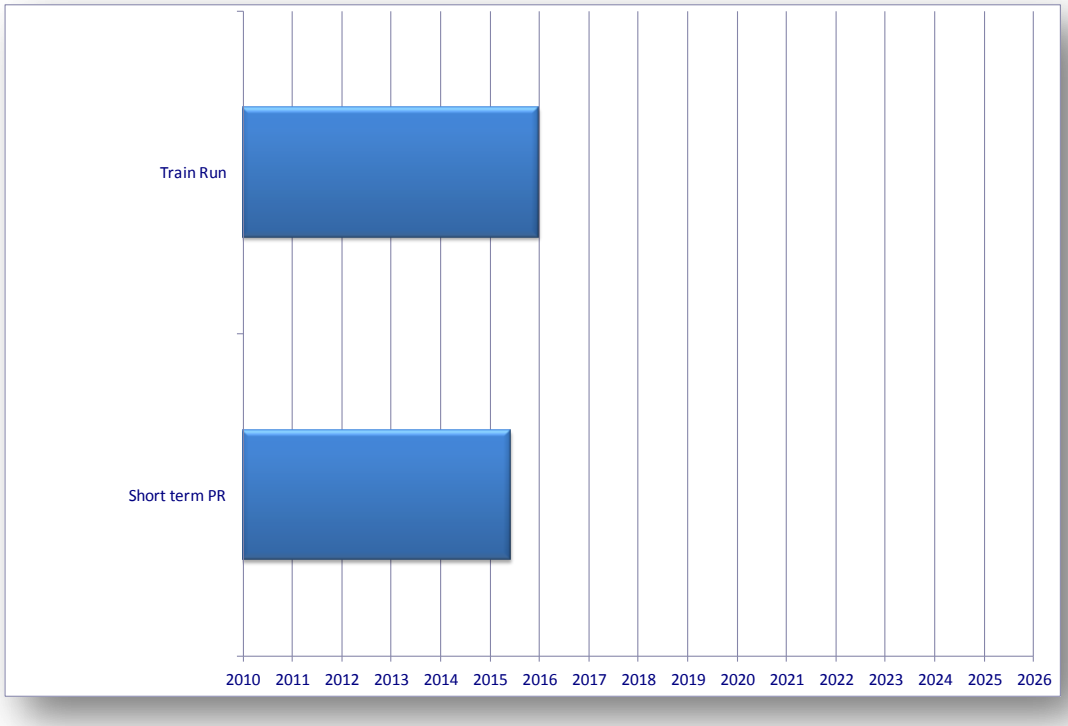


Figure 23 - Corridor 9

7 Conclusion

The preliminary results show that the TAF-TSI can be realised by the end of 2018, with most functions operational by 2016. The most difficult part of the realisation will be the TID, upon which many other functions are dependent. A pragmatic, phased approach, whereby existing systems can be used to implement TAF compliant functions without the TID will be explored.

This plan must not try to force any company into complying with a date that they cannot meet. The analysis in this report has relied on the content of the submitted Gantt and accompanying response document and the team's analysis of these must be confirmed with the railway companies during the consolidation.

It is hoped that this timeline as published it might encourage companies who have not submitted a response to also join the implementation effort by participating actively in the implementation working groups.

The Reference Documents are now stable and provide a good basis upon which to start the implementation effort. Therefore, there is no ‘risk’ for individual stakeholders to invest in the implementation. Therefore, all stakeholders should begin their implementation immediately.