

Forum Train Europe FTE

The European coordination platform of railway undertakings



FORUM TRAIN EUROPE
PLANNING TRAINS TO CONNECT EUROPE

RUs needs in TAF/TAP TSI

TEG Plenary Meeting, 25/05/2023
Frankfurt am Main



FTE is the European platform for Railway Undertakings for Capacity Management and Timetabling



82 members from whole Europe

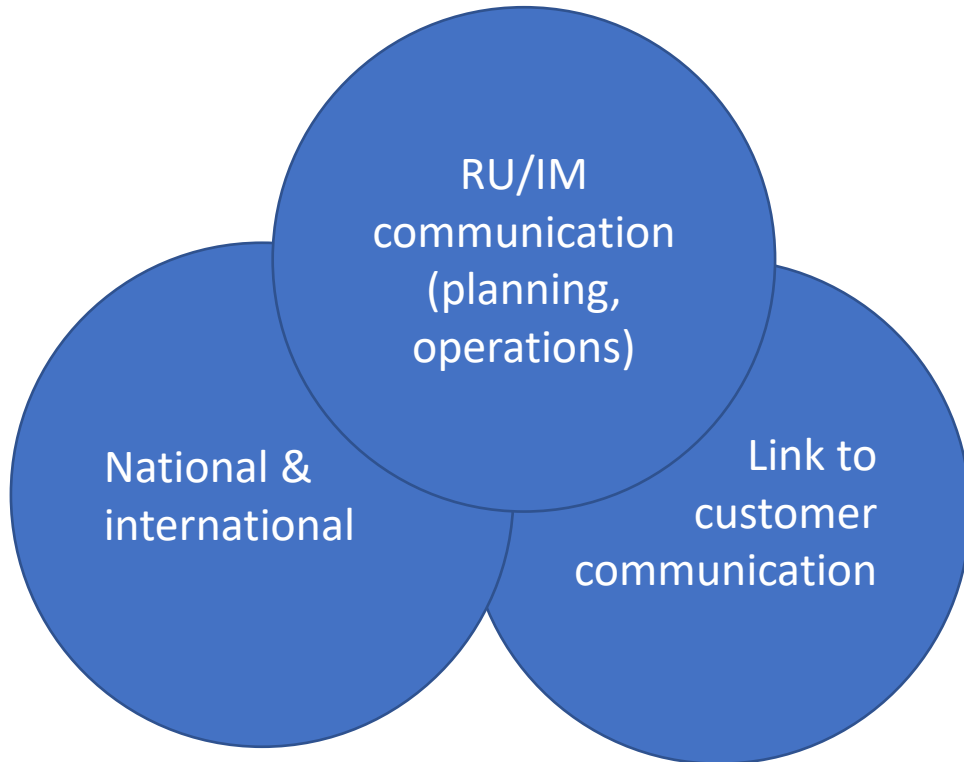
Passenger & Freight RUs

Incumbents & new entrants

Non-RU applicants & freight forwarders

Catering service providers

RU use of TAF/TAP



FTE-RU interests in IT

(focus capacity management IT)

The goal of RUs ... is to have efficient backing by the IT landscape of IMs, aligned across Europe, making no difference between national and international traffic, covering all capacities and all process steps using end-to-end standards.

A standard itself is not beneficial on its own...

RUs need TAF / TAP to be...

1. Easy
2. Transparent
3. Reliable
4. Scalable
5. Supportive



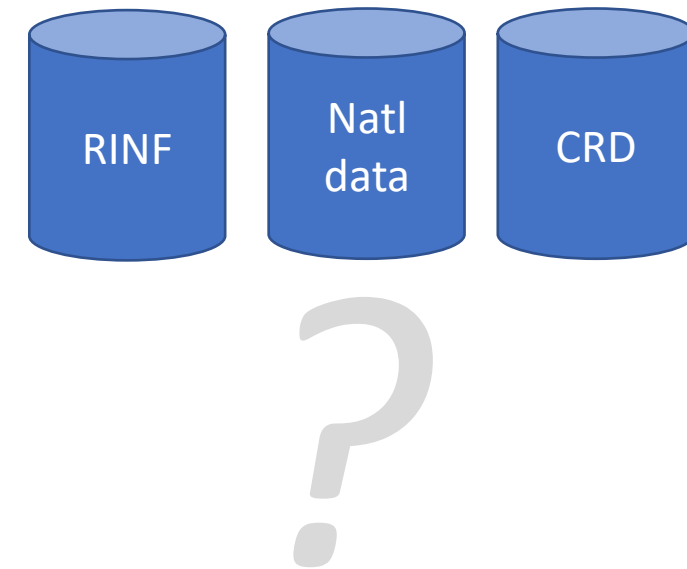
1. “Easy”

RUs need real common standard

- Reduce national specifics to zero
- Reduce overlap of different versions

RUs need clear reference data

- One source
- High-quality reliable data



TAF/TAP TSI

Lots of IMs did not even report!

Company	TAF TSI for PR in NS required	XSD version	Sector handbook version	XSD schema update	Inform of RUs in advance (months)	Supported parallel XSD versions	Automatic answer nationally To be operational	Feasibility Study support
IM a	No	3.1.0.1	3.1	Yearly	Not defined yet	Yes	2023	Yes
IM b	Yes	2.2.3	2.3	n/a	n/a	No	n/a	Yes
IM c	No	n/a	n/a	n/a	n/a	n/a	2024	Yes
IM d	Yes	the last version	the last version	Yearly	2	Yes		Yes
IM e	No	3.1.0.1	3.1	Follow DCM	6	Yes		No
IM f	No	n/a	n/a	n/a				
IM g	Yes	version available in April 2024	version available in April 2025	Dependent on European change process and the degree of change in the xsd	9	Yes		Yes
IM h	No	n/a	n/a	n/a	6			
IM i	No	PCS variant version						

Transparency is required to even start implementation planning

2. “Transparent”

RUs need easy available information by IMs

- > Ambitious and realistic IMs-Implementation plans
- > From single source
- > can be elaborated and evolve jointly
- > Shall include common testing possibilities and go live
- > At best IMs align among each other!

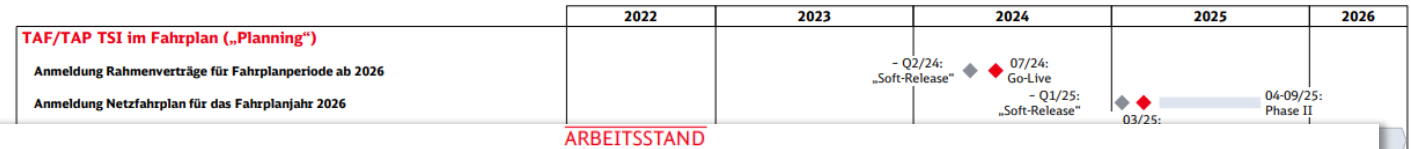
Without clarity from their IMs, RUs will not waste money for implementation!

DB Netz führt TAF/TAP vollumfänglich zum Fahrplanjahr 2026 ein.

Diese Schritte sind auf dem Weg dahin wichtig.



STAND FEBRUAR 2023

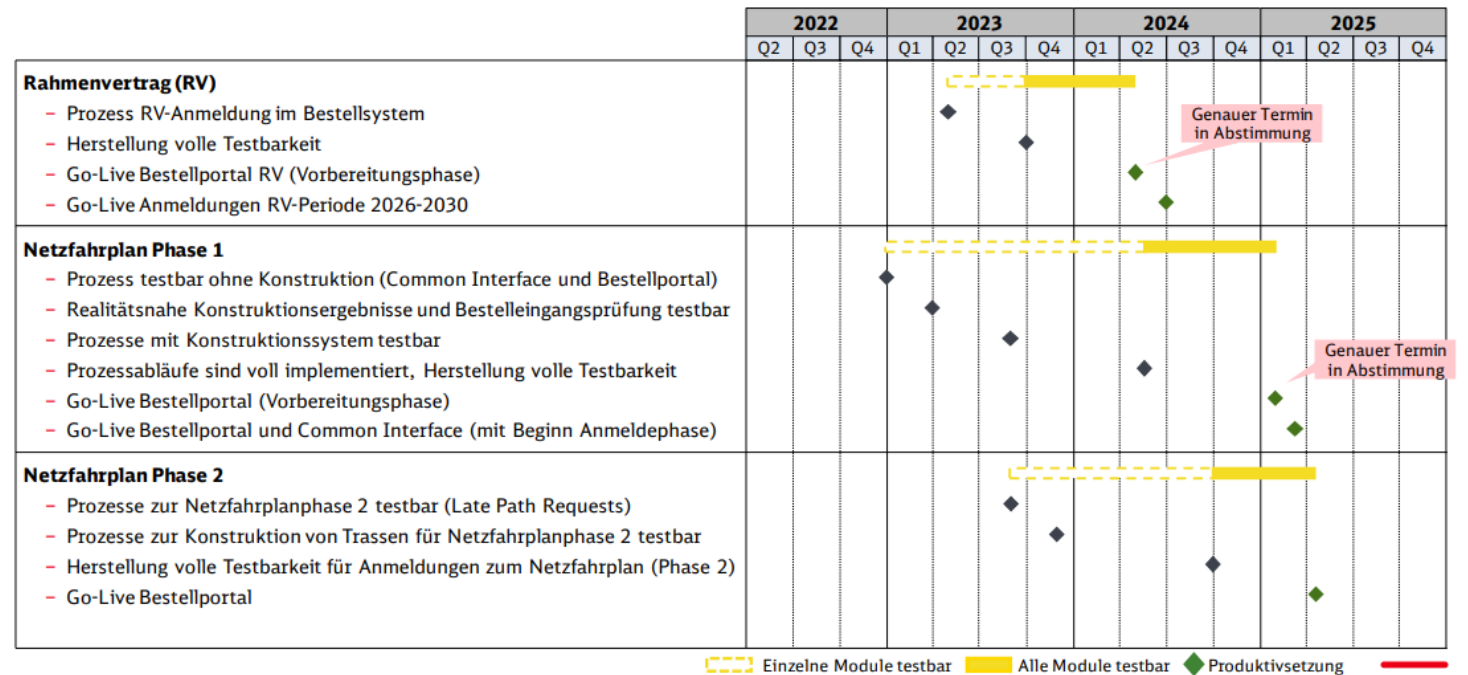


TAF/TAP TSI – Detaillierte Go-Live- und Testplanung

Fahrplan: Rahmenvertrag und Netzfahrplan Phase 1+2



STAND KW 42 2022



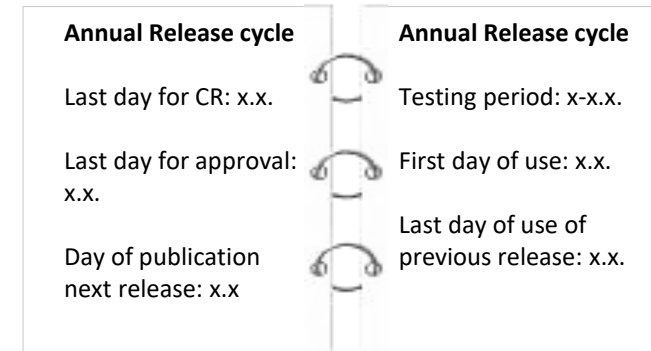
DB Netz AG | Roadmap TAF/TAP TSI: Go-Live- und Testplanung | KW42/2022

Einzelne Module testbar | Alle Module testbar | Produktivsetzung

3. “Reliable”

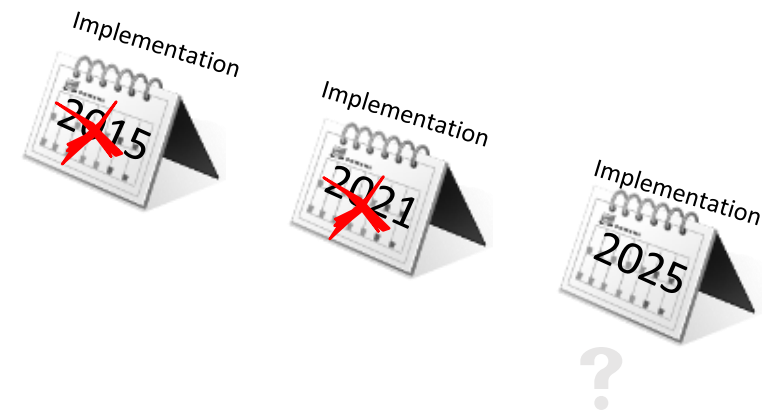
RUs need stability

- > includes plannable release cycles
- > at common dates



RUs need to know their investments are not in vain

- > Possibilities to check compliance
- > Make standard enforceable e.g. via independent body



4. “Scalable”

RUs need different possibilities

- > Direct system-to-system communication
 - > User-Interfaces from IMs
- ...as option depending on the RU, not the IM

RUs need central tools as offer, not as obligation

- > RUs shall be able to choose if using direct RU-IM exchange or using central tools like PCS
- > Business wise there shall be no difference



Central tools

can be beneficial if:

- full lifecycle of a path covered
- All capacities covered (nat/intl)
- no difference in path offer, handling etc.
- no obligation by one/some Ims
- tool is self-explaining

5. “Supportive”

RUs need TAF/TAP to

- > Address business needs
- > Be manageable with limited resources
- > Avoid technical complications
- > not imposing large, centralized IT or intermediate business actors by law. Each IM shall be directly responsible in standardized ways also with other IMs.

RUs require IM modernization

- > TAF/TAP standard alone will not provide better capacity, at shorter timings
- > Key: national modernization of each IMs IT (and of course of RUs)

Optimization models

$$\sum_{i \in \{1, \dots, \tau\}} \sum_{j=(n_1, n_2) \in A} (t_{ij} \cdot x_{ij} + \sum_{k \in O(n_2)} x_{ij} \cdot x_{ik} \cdot (T_{ik} - T_{ij} - t_{ij})) \rightarrow \min \quad (3)$$

s.t.

$$\forall i \in \{1, \dots, \tau\}: \sum_{j \in Q} x_{ij} = \sum_{j \in S} x_{ij} = 1, \quad (4)$$

$$\forall i \in \{1, \dots, \tau\} \forall n \in N \setminus (Q \cup S): \sum_{j \in I(n)} x_{ij} - \sum_{j \in O(n)} x_{ij} = 0, \quad (5)$$

$$\forall i \in \{1, \dots, \tau\} \forall n \in Q \forall j \in O(n): T_{ij, \min} \leq T_{ij} \leq T_{ij, \max}, \quad (6)$$

$$\forall i \in \{1, \dots, \tau\} \forall n \in Q \forall j, k \in O(n): T_{i+1, j} - T_{i, k} \geq 0, \quad (7)$$

$$\forall i \in \{1, \dots, \tau\} \forall j = (n_1, n_2) \in A \forall k \in O(n_2): T_{i, k} - T_{i, j} + C \cdot \overline{x_{ij}} + C \cdot \overline{x_{ik}} \geq t_{ij} + t_{H, \min}, \quad (8)$$

$$T_{i, k} - T_{i, j} - C \cdot \overline{x_{ij}} - C \cdot \overline{x_{ik}} \leq t_{ij} + t_{H, \max}, \quad (9)$$

$\forall j, k \in A \forall m \in \{1, \dots, \varphi\} \forall i \in \{1, \dots, \tau - m\}; j, k$ share blocks:

$$T_{i+m, k} - T_{i, j} + C \cdot \overline{x_{ij+m, k}} + C \cdot \overline{x_{ij}} + C \cdot \overline{x_{i+m, k}} \geq t_{\text{head}, j+m}, \quad (10)$$

$$T_{i+m, k} - T_{i, j} - C \cdot \overline{x_{ij+m, k}} - C \cdot \overline{x_{ij}} - C \cdot \overline{x_{i+m, k}} \leq -t_{\text{head}, j+m}, \quad (11)$$

$\forall i \in \{1, \dots, \tau - (\varphi + 1)\} \forall j, k \in A; j, k$ share blocks:

$$T_{i+\varphi+1, k} - T_{i, j} + C \cdot \overline{x_{ij+\varphi+1, k}} \geq t_{\text{head}, j+\varphi+1, \min}, \quad (12)$$


$\forall p \in P \forall i \in \{1, \dots, \tau\} \forall j \in A; j, p$ share blocks:

$$T_{i, j} + C \cdot \overline{x_{ij, p}} + C \cdot \overline{x_{ij}} \geq t_{\text{head}, j, p} + T_p, \quad (13)$$


$$T_{i, j} - C \cdot \overline{x_{ij, p}} - C \cdot \overline{x_{ij}} \leq -t_{\text{head}, j, p} + T_p, \quad (14)$$

$\forall i \in \{1, \dots, \tau\} \forall i \in \{i, \dots, i + \varphi\} \forall j, k \in A: T_{ij} \in \mathbb{Z}, x_{ij}, x_{ijk} \in [0, 1]$

Simple Access



Click&Ride App



From RFF on DCM...

For further reading

Position of RUs in FTE, ERFA and ALLRAIL on IT:

https://www.forumtraineurope.eu/fileadmin/user_upload/TTR/FTE_positions_on_TTR/RUs_Position_paper_2022_on_Efficient_IT_support_20221017.pdf



Efficient digitalisation to support European rail capacity management – RUs' position on IT in capacity management

Railway Undertakings – organised in FTE, ERFA and Allrail – consider efficient handling of the capacity management process as key to improving quality and reducing costs. With increasing traffic volumes and TCRs, the increased data flow requires modern, customer-oriented IT support across Europe.

RUs need to be able to work practicable and efficient in the planning. **The goal** of RUs therefore is to have efficient backing by the IT landscape of IMs, aligned across Europe, making no difference between national and international traffic, covering all capacities and all process steps using end-to-end standards.

Therefore, **the RUs ask policymakers and IMs for**

- the same standardised IT-technical access to rail infrastructure capacity all over Europe, for all capacities.
- the use of existing TAF and TAP TSI standards with the necessary additions to cover the full capacity management lifecycle, i.e. early planning, TCRs etc.
- the provision of all relevant master-/reference data by IMs in the common way and with improvements in data quality, allowing immediate use by RUs.
- adding legal enforcement mechanisms for TAF and TAP TSI to ensure that implementation is at ambitious, common timelines and with common standards. This should be supported by an IM-independent escalation and decision-making entity. Additional steering mechanisms may potentially be added, e.g. conditions to access the EU funding that this may only be paid if the common standard is reached until a specific time and so forth.
- the massive reduction (and ultimately abolition) of national specific parameters, complementing the alignment of processes, as these lead to the fact that interfaces and applications cannot be used interoperably. As long as national specifics exist, RUs would still need to invest in IT for every IM they operate on.
- the offer by IMs of technical interfaces and user interfaces resp. web browser application, respecting different sizes and IT abilities of RUs.
- the availability of capacity usage data, allowing applicants to identify available residual and blocked capacity (without the need to reveal the company details). This shall facilitate finding potential suitable capacity for additional traffic.

- market-oriented response times for path requests (and subsequent changes). Passenger and freight customers require clarity on transport times "asap" to make an educated choice on the transport mode. Competing transport modes can do this in seconds, rail currently needs weeks to months just to set up the timetable. This may require significant modernisation of IMs internal planning systems but then shall benefit all planning stages in time and quality, including TCR plans.
Creating ad-hoc offers in cross-border should be a matter of minutes.
Creating TCR scenarios, even in cross-border situations, should be a matter of hours to a maximum of a few days.
Creating longer-term timetables, i.e. path offers in the annual timetable and for multiannual planning, should be a matter of no more than some weeks.
- not imposing large, centralised IT or any intermediate actor like RFCs or RNE by law. Instead, each IM shall be directly responsible to handle capacity in such standardised ways also with other IMs. It then should be left to the IMs how to fulfil these responsibilities (which can of course, be using its associations like RNE). Thus, IMs can choose service providers and make architectural choices over time, but always remain directly in charge and the only contact for Applicants.
- a European solution – recent technology should enable common solutions for domestic and cross-border.

European frameworks shall support these requirements as a legal minimum. The legal framework shall not hinder further development or additional structures. Concretely, the legal framework shall not specify one architecture. While specifying standards for inter-system-communication it shall also not hinder the existence of other approaches like common systems for RUs and IMs. Such systems shall be able to co-exist and communicate to other elements of the rail sector IT landscape according to the common standard.

When such mechanisms are in place, RUs expect to have a sufficiently stringent legal framework to achieve common European state-of-the-art IT support without hindering developments in an area with relatively faster developments. Combining a legal framework with a common enforcement mechanism and the required flexibility for different market scenarios and further developments, RUs expect that the European rail capacity IT will contribute to reaching the Green Deal goals.

A standard itself is not beneficial on its own... but it can be made.

To sum up, RUs need TAF / TAP to be...

- > **Easy:** same standard applied everywhere, no national specifics, clear reference data will create use cases for RUs
- > **Transparent:** ambitious, easy available IM implementation plans will make RUs impl. Plans possible
- > **Reliable:** transparent release cycles and possibilities for enforcement will motivate RUs investments
- > **Scalable:** supporting different ways of implementation, with central elements an offer but not an obligation, will allow very different RUs to use it
- > **Supportive:** following strict business needs, avoiding complication through additional business layers, and with underlying national IM modernization, RUs can see tangible benefits for TAF/TAP implementation

*Are we
there yet*





Thank you for attention

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