RNE TTR Migration Concept

Version 1.0

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VERSION	RESPONSIBLE	DATE	CHANGES
0.1	Philipp Koiser Head of S&TT / Leader TTR Programme	2020-03-06	Document created by Philipp Koiser (w. inputs from Harald Reisinger/RNE CIO and Elisabeth Hochhold/RNE Head of Legal Matters)
0.2	Philipp Koiser Head of S&TT / Leader TTR Programme	2020-04-09	Document updated based on results of the IM workshop on 8 April 2020
0.2-1	Philipp Koiser Head of S&TT / Leader TTR Programme	2020-04-16	Finetuning and corrections in the process description by participants of the IM workshop
0.3	Philipp Koiser Head of S&TT / Leader TTR Programme	2020-04-28	Update performed by the TTR Steering Committee in its workshop 28 April 2020
0.3-1	Philipp Koiser Head of S&TT / Leader TTR Programme	2020-04-29	Corrections in Task 2 "Pilots"
1.0	Philipp Koiser Head of S&TT / Leader TTR Programme	2020-05-20	Inclusion of corrections and approval by RNE GA on 20 May 2020

Introduction to the TTR Migration

Management Summary

Market requirements made it necessary to consider parts of TTR being implemented earlier than originally scheduled with some additional components being included. The 'TTR Migration Concept' aims for an acceleration of the TTR implementation wherever possible and integrates additional market demands. Therefore, IMs and ABs have been asked to participate as first-wave implementers of essential TTR components, while the original implementation timeline (full TTR implementation for timetable 2025) still is upheld for all other IMs/ABs and TTR components.

To provide a good starting point, IMs/ABs participating in the first wave preferably already have experiences from TTR Pilots. Additionally, they are asked for their commitment to contribute financially and with (human) resources.

In the TTR Migration, they must…
- … **finetune the TTR process**.
- … agree to participate in **new implementation pilots**, to commonly work on the defined tasks, and to define lines for the new TTR pilots.
- … agree on how to **implement (common) TTR IT systems** including their connections with each other.
- … launch all actions required to **cope with national particularities** hindering the implementation of new TTR pilots.
- … **evaluate their costs** for the migration.

A facilitator of TTR is IT. Therefore, financing IT Systems is an important step towards implementation. For the TTR IT landscape, the following principles apply:
- The pace of the process must be accelerated by IT
  → **maximum use of pre-planning and automatization and removal of obstacles in the information flow**
- Only one system for international request for the users (one point of connection)
  → **no switch to other systems (optional national request)**
- Any activity by a user should be done only once
  → **no redundant actions and waste of efforts**
- The full life cycle of an item (particularly path requests) must be handled in one system
  → **no switch to national systems at a certain stage**
- Existing systems (legacy systems) cannot be replaced with central IT
  → **central IT must ensure communication between legacy systems, for which legacy systems must be adapted**

All this requires having one common process with defined activities and milestones (TTR process) and common standards to communicate without deviating national qualities (TAF/TAP TSI).

About this document

The 'TTR Migration Concept' describes the updated way from the current timetabling process in Europe to TTR being fully implemented. It will achieve an acceleration by increasing investments, focus on main components and use of best practice. It contains all relevant information about the TTR process itself, the motivation behind its creation and describes the basics all necessary preconditions.

Ambition of TTR

The situation in planning railway capacity has become acute in many countries. The current path allocation process has been introduced about 20 years ago with its roots going back even further. It is no longer adequate in countries, which must deal with:

- Increased number of track works and other Temporary Capacity Restrictions (TCRs)
- Increased number of Railway Undertakings (RUs) and applicants applying for railway capacity and different business models (open access, cooperation)
- Increased demand for railway capacity due to growing traffic volumes
- Differing customer requirements in terms of long-term vs short-term planning

TTR will provide a market adequate capacity planning and allocation process, which copes with this changed situation, and uses all possibilities of digitalization.

Evolution of TTR

2014

In 2014, RNE and FTE have joined forces to create a new capacity management process. Supported by ERFA, basic requirements of IMs/ABs, as well as market requirements by freight and passenger RUs were identified and used as baseline for an ambitious new capacity planning process.

2017

After the conception phase, in which more than 200 experts provided their input, the basic process was approved in 2017. To test, improve and enhance this concept, several pilots were launched on and along Rail Freight Corridors. The first timetable year which provided capacities according to TTR was the timetable 2020. In parallel, the drafting of concepts for IT and commercial conditions as well as basic legal analysis were launched.

2020

As of 2020, first results from the TTR pilots are available with several additional pilots preparing for timetable 2021. The definition of the basic IT requirements is almost finished and basics for commercial conditions have been created. Also, the main legal requirements have been identified.

Starting 2020

With the experiences collected, concepts available and the growing need for a harmonized, efficient, and market-oriented capacity management process, the next phases must be launched now. This important phase – the *'TTR Migration'* - requires ambition and resources, with the current TTR pilots providing the launching pad into the full TTR implementation.

Benefits of TTR

Overall, TTR provides highly improved access to capacity, high cost efficiency for all stakeholders by reducing redundancies and by using digitalization (real-time information and maximum automatization).

- In addition to the cost reduction due to higher efficiency, TTR will provide IMs the possibility to increase the usage of infrastructure capacity.
- Passenger RUs will have the possibility to plan and request capacity early and to provide their products to the market already 6 months prior to the timetable change.

- Freight RUs can react quicker to market needs by receiving harmonized and reliable infrastructure capacity within minutes after request also on short notice.
- All RUs and applicants will have better and quicker access to infrastructure capacity, a real-time overview of available capacity with capacity products designed for their respective needs as well as higher stability of paths, increasing their planning efficiency.
    o More competitive railway planning in the intermodal environment.
    o Better reliability of planning parameters in all planning stages

Vision

Access to railway capacities must **become as easy as access to road** capacities. This way, railways increase their competitiveness in the modal split and reach higher market shares. Several initiatives, such as '30 by 2030', the Rotterdam Declaration and the objectives of the European Green Deal[1] can only be achieved by applying a new capacity management process, with its main goals:
- Strong focus on freight and passenger market needs with optimised request deadlines
- Improved reliability and stability, especially by considering temporary capacity restrictions (TCRs)
- Increased efficiency (capacities, resources) by avoiding duplication of work and planning efforts

In order to achieve this ambitious goal, a mandatory, harmonized implementation and application of the redesigned process is necessary.

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[1] In Chapter 2.1.5 of its Communication on a European Green Deal the Commission highlights the need for measures to manage better and to increase the capacity of railways and announces to propose such measures by 2021.

Task 1: Finetuning of TTR Components

Main Components of TTR

Capacity Requests

Based on the market needs evaluated in the first steps in the TTR creation, the market requires the following request methods
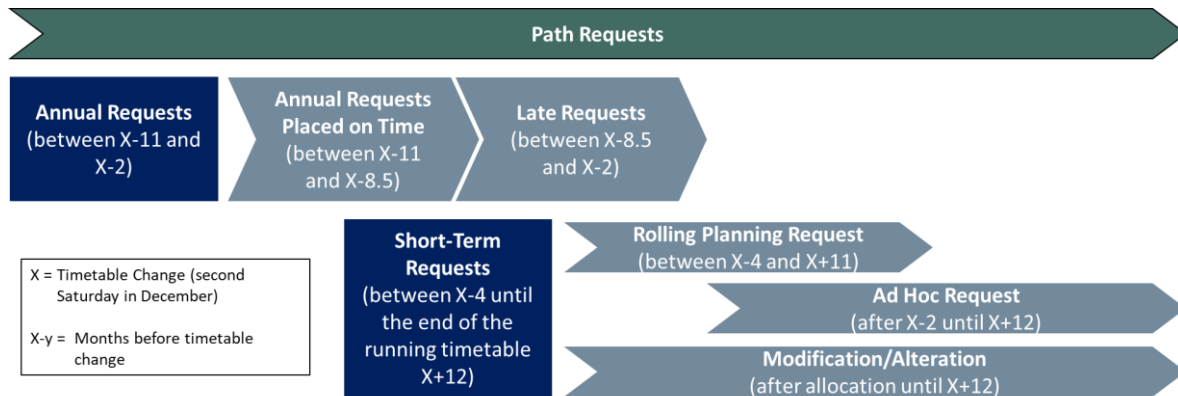
- The <u>annual requests</u> for long-term planning of capacity (primarily demanded by passenger traffic).
  - o <u>Annual requests placed on time</u>
    Requests considered in the working timetable placed before the path request deadline at X-8.5
  - o <u>Late requests</u>
    Requests are possible at any time after the annual request until X-2, which can be included in the working timetable before the timetable change.
- <u>Short-term requests</u> for on-demand capacity needs:
  - o <u>Rolling Planning requests</u> (primarily demanded by freight traffic)
    A new request method specifically designed for high-quality freight traffic with safeguarded and pre-planned capacity available 4 months before the first operation day.
  - o <u>Ad hoc requests</u> (especially demanded by freight traffic)
    Requests are possible at any time after the annual request, which might not be included before the timetable change.
  - o <u>Path modification and alteration</u>
    Changes to already allocated paths by RUs/applicants (modification) or IMs (alteration).

Although the different request methods are designed to meet different business needs, none of the request methods is limited to one type of transport.

Advanced Planning, Capacity Models and Capacity Planning

To provide good capacity to the market, harmonization and coordination between IMs is required in advance. Finally, capacity must be partitioned already before the request phase into:

- Capacity needs for stable traffic (especially for passenger traffic)
- Capacity needs for flexible traffic (especially for freight traffic)
- Capacity needed for Temporary Capacity Restrictions (TCRs)

This partitioning is reflected in the Capacity Model, which is a preliminary model timetable. In the subsequent capacity planning phase, the capacity model is transformed into capacity products published for requests.

Note: More detailed information on the main TTR components can be found in Annex II.

Preconditions

To ensure that the ambitious TTR process works, several pre-conditions have to be provided:

- IT systems, which ensure a steady information flow, triggering the correct actions from concerned stakeholders (e.g. call for harmonization of TCRs) and provide efficiency with good use of automatization (see task 3).
- Legal framework, which is needed to define the key elements of the process and the main obligations of each stakeholder in the process (see task 4).
- Commercial conditions, which ensure that all elements and request methods of TTR are used as efficiently as possible.

The IMs and RUs first migrating TTR must finetune the TTR process:

- Improvement of process: The TTR components have been described by a dedicated team of experts in theory. When applying them, IMs must cross-check how to make best use of them and consider changes in order to access their full potential. All stakeholders – especially RUs – must be considered in this finetuning process.
- Inclusion of TCRs: An essential part is the planning and coordination TCRs, which must be tackled with high priority. This process is relevant from the early stage of capacity planning to the last day of a timetable year and must become a fully integrated process.
- Provision of commercial conditions: In addition, effective steering of the stakeholders' behavior in the process is needed. Commercial conditions must be applied to ensure that all stakeholders have the incentive to plan as constructive as possible and prevent unnecessary blocking of capacity, redundancies, instabilities, and other inefficiencies. Such commercial conditions must follow basic principles (i.e. to be fair, balanced and have a good steering effect) and should not be used as additional financial source by any stakeholder in the process.

Task 2: Definition of Pilots

Countries with Pilot Lines

Since there are already running or scheduled TTR pilots, the following countries/IMs were first asked to conduct implementation pilots on lines to be specified:

- France (SNCF Réseau)
- Belgium (Infrabel)
- Netherlands (ProRail)
- Luxembourg (ACF, CFL)
- Germany (DB Netz)
- Austria (ÖBB INFRA)
- Sweden (Trafikverket)

- Switzerland (SBB Infra, BLS Netz, Trasse Schweiz)[2]
- Italy (RFI)

Further IMs/ABs are invited to join by the end of May 2020.

The IMs first migrating TTR must agree to participate in implementation pilots with the goal of implementing TTR, to commonly work on the defined tasks, and to define lines for the new TTR pilots.

Lessons learned from previous pilots must be taken into consideration. Already existing pilots may also be used for this purpose. This activity shall allow the finetuning of TTR components, provision, test, and improvement of pre-conditions, resulting in the proof of concept of TTR. The pilots will be considered the first stage of full implementation. The expected results must be defined and lead to learnings/adjustments for full TTR implementation.

The following points must be considered in the definition of implementation pilots:

- Scope and location of pilots with international harmonization: The pilot lines should be based on lines with dense and diverse traffic. IMs must be ready to provide investments into the pilots with the dedication to fully implement TTR after the piloting phase. In any case, all approaches must be internationally aligned and connected. Commercial conditions must be tested (note that on different pilots different commercial conditions may be used but must be aligned for the final roll-out).
- Commitment by stakeholders: All stakeholders on the pilots (IMs, Allocation Bodies, RUs/Applicants, Regulatory Bodies, Ministries of Transport, etc.) must be involved in the process and must be committed to implement TTR. All process elements as defined on the pilots must be used in the same way by all stakeholder on the respective pilots. The lead is with the IMs, which must agree to the full scope of the TTR implementation. Market requirements must be taken into consideration at all times.
- Adjacent processes: In the TTR pilots, lines with the TTR process implemented will be connected with lines using different allocation processes. IMs must find the best possible way to compensate this situation and to provide stakeholders with a solution for such situations.

Task 3: Implementation of a TTR IT Landscape

As IT is following the business process, updated business concepts will lead to updated requirements for IT. The following chapter shows the current general plans for the IT implementation but is still subject for further updates and finetuning.

Goal and Ambition of TTR IT

IT systems are an important basis for any modern process. The Capacity Model and capacity requests as defined in TTR require IT to ensure:

- Communication between all stakeholders,
- Coordination of capacity needs (market needs and unavailable capacity due to TCRs) through the whole process,
- Provision of transparent information to the applicants

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[2] Pilot CH: Pilot with Germany to evaluate and test a common Capacity Strategy and Model

- <u>Means to reduce the time between path request and allocation to a minimum by applying maximum use of automatization.</u>

A first concept for the TTR IT Landscape has been drafted. However, considering railways' competitors, further ambitions especially in regards of speed and flexibility (e.g. by using automatization) must be achieved. In comparison with the current situation, the aim should be mostly automated allocation with little manual work in harmonization.

Path requests

To become competitive with road traffic, it is essential to have easy and quick access to infrastructure capacity. This must be supported by IT systems. It must be possible to request international capacity in one common system (results must be the same, regardless which system is being used), which is connected to national systems. Standards should be used that ensure that national and international requests are placed with equal parameters and without national particularities. The goal is that RUs/Applicants can have one interface to the IMs to place capacity requests.
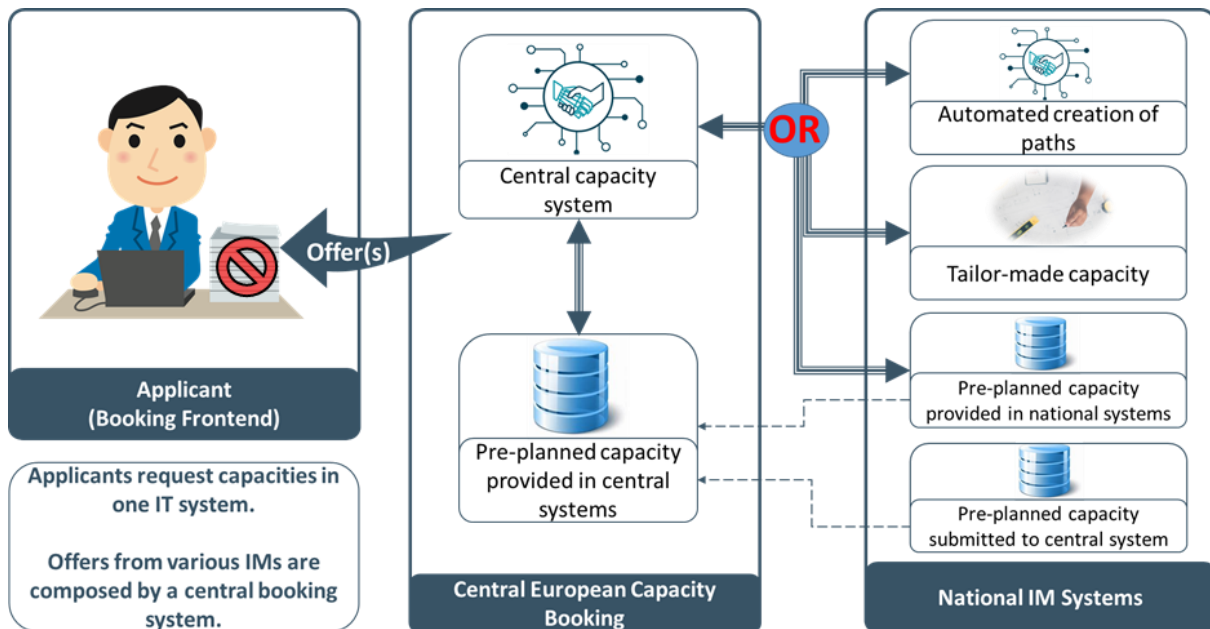

The anticipated acceleration of the process can be achieved with IMs using either one of these methods:

- IMs provide their capacity based on automated path allocation
- IMs pre-plan their capacity and provide the information in a central (international) system (capacity hub)
- IMs pre-plan their capacity and provide the information in their national system, accessible for a central tool

Advanced Planning, Capacity Model and Capacity Planning

Quick access to capacity requires a good overview of available capacity, which is published in digital form or is made available in real-time for short-term requests. This requires that capacity must be translated into digital capacity models which are aligned and harmonized between IMs. It must also consider that some capacity is not available due to TCRs.
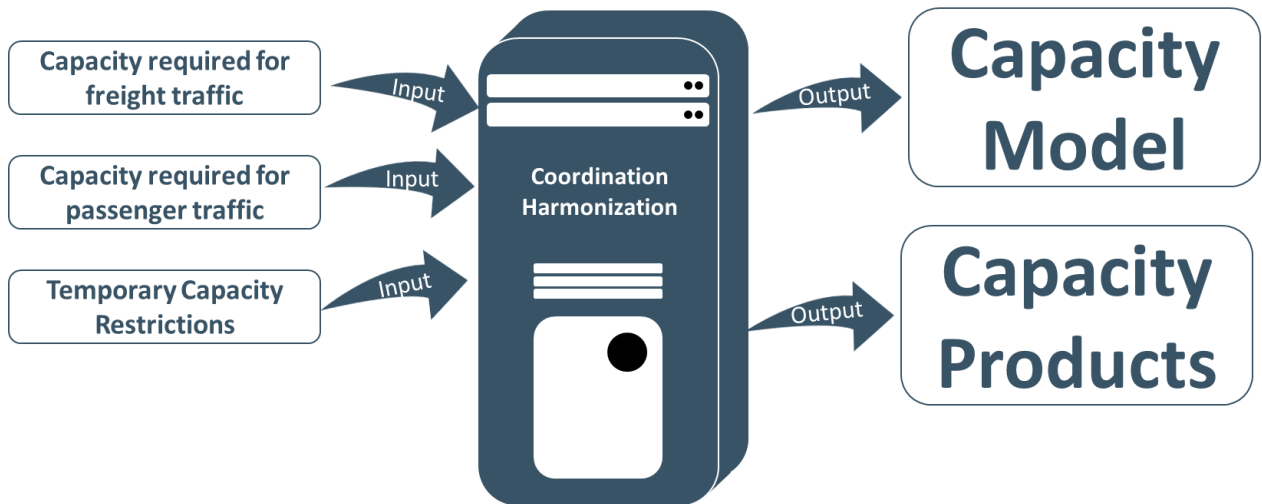
Based on the capacity models, partitioning of capacity must be possible to finally publish capacity products for:

- Long-term planning (annual requests, including late requests)
- Short-term planning (Rolling Planning and ad hoc requests)

The IMs first migrating TTR must agree on how to implement (common) TTR IT systems including their connections with each other.

The TTR IT Landscape as currently described in TTR (see Annex III) must be compared to the goals and ambitions. Changes, improvements, updates must be done by the IMs on the pilots.

- As first step, the possible methodology of IMs to provided capacity must be evaluated (automated or pre-planned).
- Based on this, a central capacity booking system must be defined following the principles:
  - o The different IM methods must be combined in a central capacity booking system, in which path requests can be placed.
  - o Requested paths must be negotiated between this central booking system and the individual national IM solutions.
  - o Based on the results, one or several combined offers will be provided to the customer.
- The precondition for the booking system is a national and European wide available digital capacity supply, i.e. a real-time picture of available capacity at all times (at least on national level).
- Accessibility and usability for applicants must be ensured.

Task 4: Evaluation of the Legal Framework

Legal Situation and Current Analysis

The current legal framework in Europe has several pressure points for TTR, which originate from the following situations:

- The current legal framework provided by the EU is largely based on the existing capacity allocation process. This process is based on an approach where all customers should be free to request train paths as best suits their needs; by means

of coordination and cooperation IMs should be in a position to meet most of their customers' needs. However, in times of growing scarcity of capacity this process is increasingly conflicting with the objective to ensure an optimum effective use of capacity. To allow for progressive methods to tackle higher ambitions in terms of capacity usage changes to the European legal framework appear to be necessary.

- The national legal frameworks are often characterized by additional rules complementing EU legislation (national particularities); moreover, different national interpretations of the EU Directives and Regulations hamper the implementation of commonly agreed processes. To enable the implementation of a harmonized process, national laws must thus be aligned.

However, the current EU legal framework can sustain the first piloting phase of TTR. A possible approach can be to implement Pilots on Rail Freight Corridors, based on Regulation 913/2010 and its Frameworks for Capacity Allocation (FCAs).

As first step, TTR must analyze the compatibility of core TTR components with today's European legal framework. In addition, a detailed legal assessment and a gap analysis based on the finetuned process will be conducted to highlight the needs for future legal developments.

Considering the timeline for measures to manage better and to increase the capacity of railways announced by the European Commission in its European Green Deal Communication and the ongoing review & planned revision of Regulation 913/2010, which should be in line with requirements from TTR, this analysis must be done by autumn 2020 (September/October 2020).

The aim is to have a legal framework approved during the mandate of the Von der Leyen-Commission (2019-2024), which provides a binding legal basis for a full TTR implementation.

> **The IMs first migrating TTR must launch all actions required to cope with national particularities hindering the implementation of new TTR pilots.**
>
> In addition, findings must be shared with the 'TTR legal framework' task force to improve the list of detected pressure points and shortcomings in the European legal framework

Task 5: Provision of Financing

Description of the Financial Situation

Rail infrastructure requires heavy investments in its creation and maintenance. Comparably little investments are required to build up an IT architecture which allows efficient and harmonized use of rail capacity. However, these investments are currently not available. Based on the experience of recent years, it can be assumed that IMs and RUs are massively underinvested in digitalisation. Therefore, a massive financing of digitisation projects (IT) through funding is essential.

In a business case created by the TTR programme in 2019, a total investment into a central TTR IT landscape of approximately 20 Million EUR was calculated. In addition, approximately 280 Million EUR were estimated for national IT developments to adapt legacy systems to support the TTR process in the first implementation phase until 2025. Updated figures will be provided separately.

The TTR IT Landscapes includes central and national components including their connection. All these parameters have to be included in a common financing concept.

> **The IMs first migrating TTR need to evaluate their costs for the migration.**
>
> As IMs rely on funding, authorities – such as the European Commission – are asked to support the migration by investing into a common European TTR IT landscape and the change management (e.g. project management, communication to all stakeholders, training of staff on new approaches and IT). The investment shall support the IMs in the first migration (2021 to 2025) as well as the IMs and RUs in the full rollout (2024 to 2027).
>
> However, more sophisticated and automated IT systems will likely require larger investments than anticipated in the Business Case. This requires a new financial estimation.

Migration Organization

Governance and Working Methods

All of the described tasks must be organized in a common project. The respective IMs/ABs will also be asked to propose project structures, in which all stakeholders' involvement is secured.

The overall governance of the TTR Migration will be covered by RNE. The decision-making process in the TTR Migration will be based on two levels:

- Strategic decisions (i.e. how to implement)
  Strategic decisions must be done on high management levels, since it includes the provision of resources and has an impact on other stakeholders' way of working.
- Operative decisions (i.e. finetuning of existing TTR concepts)
  Since TTR is being implemented simultaneously on different levels, changes of the TTR concepts must be brought to the attention of the middle managements and operative staff (concerned with the implementation of TTR).

Overall, the implementation must be monitored and steered centrally to avoid any misalignments within the complete TTR implementation projects. On the other side, decisions must be possible in short periods of time. Therefore, a lean project structure with expert project managers must be applied.

Stakeholder Involvement

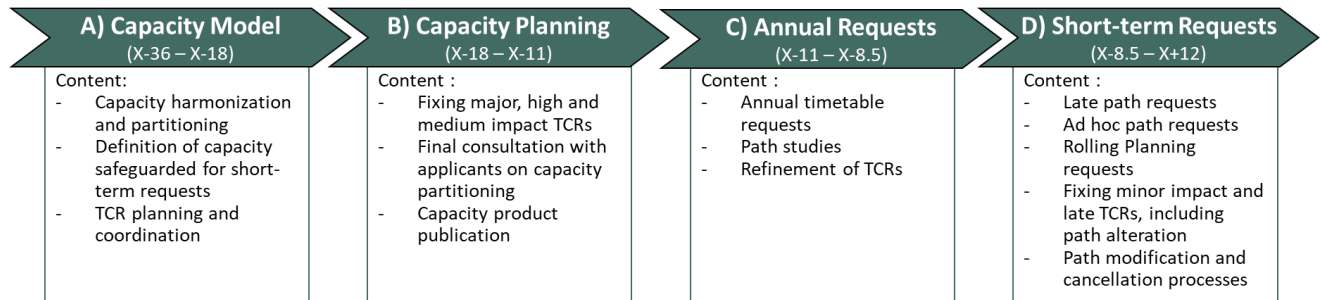The project must ensure that all relevant main stakeholders are involved in the migration of TTR. These include:

Stakeholders	European level	National level*
RUs/applicants	Rail Freight Forward, FTE, ERFA, RU Dialogue, CER High Level Groups	Advisory boards, national associations
Regulatory Bodies	IRG-Rail, ENRRB	Advisory boards
Ministries of Transport	SERAC, NExBo	Advisory boards
European Commission	Platforms with DG MOVE (SERAC, PRIME, ENRRB, etc.), TTR Legal Matters task force	*[does not apply]*
Others (to be extended)		

*) depending on the country, further already existing platforms can be used

Work Packages

The work packages of the TTR Migration will be based on the and core competencies of the TTR process:

TTR Migration: Main Work Packages

A) Capacity Model (X-36 – X-18)	B) Capacity Planning (X-18 – X-11)	C) Annual Requests (X-11 – X-8.5)	D) Short-term Requests (X-8.5 – X+12)
Content: - Capacity harmonization and partitioning - Definition of capacity safeguarded for short-term requests - TCR planning and coordination	Content : - Fixing major, high and medium impact TCRs - Final consultation with applicants on capacity partitioning - Capacity product publication	Content : - Annual timetable requests - Path studies - Refinement of TCRs	Content : - Late path requests - Ad hoc path requests - Rolling Planning requests - Fixing minor impact and late TCRs, including path alteration - Path modification and cancellation processes

In each of these work packages, all listed tasks must be tackled.

1. Finetuning of TTR components
2. Definition of pilots
3. Implementation of a TTR IT landscape
4. Evaluation of the legal framework
5. Provision of financing

The specific descriptions can be found in Annex I of this document.

Proposed Timeline 2020

End of April 2020:

- Finalization of draft concept to be shared with the RNE GA
- Provision of financial estimation for IT to be included

20 May 2020: RNE GA approval of the TTR Migration Concept (described in this document) and presentation to DG MOVE in order to provide input for possible funding schemes

10 June 2020: Presentation of TTR Migration Concept to FTE Plenary Assembly (described in this document)

May – November 2020: Revision the TTR organization according to the migration concept

- End of June: Setup of the new TTR Core Team (including project and WP leaders)
- By October: Creation of an implementation plan (when and where will TTR be implemented)
- By October: Definition of and agreement on new pilots
- By October: Definition of change management procedures within TTR (i.e. changes of TTR components)

December 2020:

- RNE GA approval of the revised TTR organization, including pilots
- FTE PA approval of the revised TTR organization, including pilots

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[3] This timeline is based on the timelines announced by the European Commission for the revision of Regulation 913/2010 and for measures to manage better and to increase the capacity of railways announced by the European Commission in its European Green Deal (= 2021).

Annex I: Content of Work Packages

	A) Capacity Model	B) Capacity Planning	C) Annual Requests	D) Short-term Requests
1) Finetuning of TTR components	The Capacity Model must serve as means to coordinate, partition, and assign capacities according to the requirements (market requirements, TCRs). As the capacity model works with representative days and TCRs are planned with calendars, a connection between the models' calendars and the TCR calendar must be created. Annual Timetable, Rolling Planning and ad hoc capacity must be assigned to different traffic types in the capacity partitioning.	The Capacity Model must be transformed into capacity products (capacity bands, system paths, safeguarded capacity for short-term requests) available for applicants' requests. All major, high and medium impact TCRs must be fixed before publication. Incentives for IMs must be created to avoid a lack of stability of the published products (e.g. due to many late TCRs). A commitment of IMs to the commercial offer must be made and kept up until train operation. The possibility for multi-annual requests must be tackled according to market requirements (either original approach in Rolling Planning or alternative).	Applicants knowing their path details in advance have the possibility to request paths until X-8.5. Path requests must be possible after this deadline (i.e. "Late Requests"). Capacity safeguarded for short-term requests cannot be requested. Minor impact and late TCRs must be considered in the allocation process. Commercial conditions must be applied to avoid overbooking in the annual timetable by applicants. It must be evaluated whether the use of commercial conditions is sufficient in safeguarding capacity (market driven) or if IMs must still safeguard capacity to ensure late requests (IM driven).	Safeguarded, residual and non-pre-planned capacity are open for requests, using any of the following request methods: - Ad hoc requests - Rolling Planning requests Minor impact and late TCRs must be considered in the allocation process. A definition for ad hoc requests must be found, especially for requests in 30 days or less before the TT start. The creation of safeguarded capacity must be as close as possible to the actual market need. The assignment of the capacities to the respective transport must be clear.

			The assignment of the capacities to the respective transport must be clear.	
2) Definition of new and extended pilots (if needed)	The pilot lines must be chosen to also contain international lines. Ideally, branch lines are tackled as well to see the network effect of capacity models.	The scope of available capacities must be agreed. The effect of the 'hybrid situation' should be avoided as much as possible. IMs must also evaluate the possibilities to implement network pilots.	The possibility to have a changed timeline must be provided by the pilots. The focus must be on the provision of earlier offers. Some pilots must also tackle the specific requirements for passenger traffic.	There must be enough products available for short-term path requests to evaluate the effect.
3) Implementation of a TTR IT landscape	Components of the capacity model must be defined and shared via an IT system. Publication of TCRs must be ensured (check the possibility to publish in different tools/modules). Coordination of capacity must be possible in a user-friendly way, aiming for capacity models ready by X-18, at which time major and high impact TCRs must be included.	Capacity products must be published at X-11, with flexibility to include minor impact and late TCRs and with safeguarded capacity protected from annual requests. Major, high and medium TCRs must already be included.	Based on published and non-pre-planned capacity, applicants must be able to request paths (national and international) in one system. Safeguarded capacity must be protected in the systems. Allocation must be supported by a capacity broker, which supports the allocation by using either pre-planned capacity or by requesting capacity from national systems.	Requests must be possible at any time. Available capacity must be transparent via IT systems in real-time. The lead times from the various request methods must be kept as short as possible, making use of - Automated path allocation - Pre-planned capacity (in central or national system) via a capacity broker, either available in national or a central system (capacity hub).

				Late and minor impact TCRs as well as adjustments of fixed TCRs must be reflected in the available capacity in real-time. Changes of allocated paths due to IMs' (alteration/cancellation) or applicants' needs (modification/cancellation) must be included.
4) Evaluation of the legal framework	The capacity model must be the legally binding basis for the later path allocation. All relevant stakeholders' involvement must be secured. Basic rules for partitioning should be provided.	The publication of capacity products must be mandatory for all IMs. This includes the definition of the different products, compliance with requirements to ensure their stability and their international harmonization.	Annual requests cannot consume capacity safeguarded for short-term requests. The legal framework must avoid that all capacity is used already with no leftovers for short-term requests. The legal framework should support earlier planning for stable traffic, especially passenger traffic. Commercial Conditions must be supported by law. NOTE: As described in work package B1, the need for safeguarding capacity with well working commercial conditions must	The possibility to safeguard (even significant parts of) capacity must be available.

	be checked. It is possible that both approaches are required for individual IMs.
5) Provision of financing	General financing of all IT modules, including interfaces, as described. Particular focus should be on IMs' IT developments. TTR IT implementation will require funding by the European Commission as well as modern capacity planning is a benefiting factor for the Green Deal. Funding of non-EU countries should be aimed for as well to ensure that the whole European core network is tackled. A main success factor is the implementation of national and international IT. Also, project management of the TTR migration to ensure a harmonized roll-out of all work packages.

Annex II: Description of TTR Main Components

Capacity Requests

A main weak point of nowadays process is the complexity and duration of the process to request capacity and the little orientation towards the applicants' market needs. Applicants planning on short-term have a significant disadvantage since in most countries long-term planners can request most of the capacity, leaving only little and low-quality residual capacity for later requests (despite the possibility given by the EU legislation to safeguard some good capacity for ad hoc requests).

TTR remedies this unbalanced situation by keeping capacity safeguarded for later requests. Of course, residual capacity is also available for short-term requests. Overall, TTR provides the possibility to request capacity at any time with market-oriented and quick response times.

- The annual requests – including late requests - will ensure that long-term planning of capacity is possible, which is highly demanded by passenger traffic.
- Short-term requests, which are highly demanded by freight traffic, will be possible as either Rolling Planning requests or ad hoc requests. Path alterations (by IMs) or modifications (by RUs/applicants) will also be possible.

		When?	Which capacity?
Annual Requests	**Annual Request Placed on Time**	X-11 – X-8.5	Pre-planned or non-preplanned capacity
	Late Requests	X-8.5 – X-2	Residual capacity from annual requests (preplanned and non-preplanned capacity)
Short-Term Requests	**Rolling Planning Request**	M-4 – M-1	Pre-planned (safeguarded) capacity
	Ad Hoc Request	X-2 – X+12	Residual capacity from annual and rolling planning (<M-1) requests and dedicated safeguarded capacity
	Path Modification[1] /Alteration[2]	After allocation until X+12	Depending on original request: Residual capacity OR alternative rolling planning capacity

1) Requested by applicant
2) Request by IM

Capacity Models

To allow this flexible, dynamic and efficient allocation of rail capacity and make it available to the market, capacity must be planned in advance and harmonized all over Europe. This can be achieved with Capacity Models, which are to be created for each timetabling year, especially on international lines.

A main aspect which has to be taken into account when planning capacity is capacity which is not available due to temporary capacity restrictions (TCRs). Track works, which represent a large part of TCRs, are necessary to allow safe railway operations. However, applicants need to be informed about these TCRs in due time to plan alternatives with their impact reduced to a minimum.

To serve all these needs, Capacity Models are provided as preliminary timetables, which contain all known and anticipated capacity needs:

- Capacity needs for traffic which can be planned long in advance (primarily passenger traffic)

- Capacity needs or traffic of which details are available on shorter notice (primarily freight traffic)
- Capacity needed for Temporary Capacity Restrictions (TCRs)

Annex III: TTR IT Landscape Description (Draft)

Digitalization has already progressed nationally within most of the process stakeholders, leading to a variety of systems implemented throughout Europe. As the TTR IT landscape must be built on these so-called 'legacy systems', a strong focus must be put on communication. Therefore, a central IT framework is required, which serves as communication hub and provides central and easy access to infrastructure capacity.

For communication between systems, a common standard must be used as common 'language' or 'dialect'. TTR IT will use the TAF/TAP TSI regulation to describe IT communication and the messages to be exchanged. TAF/TAP TSI is legally binding, aiming for the purpose of having common language in European communication. New requirements from the TTR IT project are immediately forwarded to the TAF/TAP TSI groups for review.
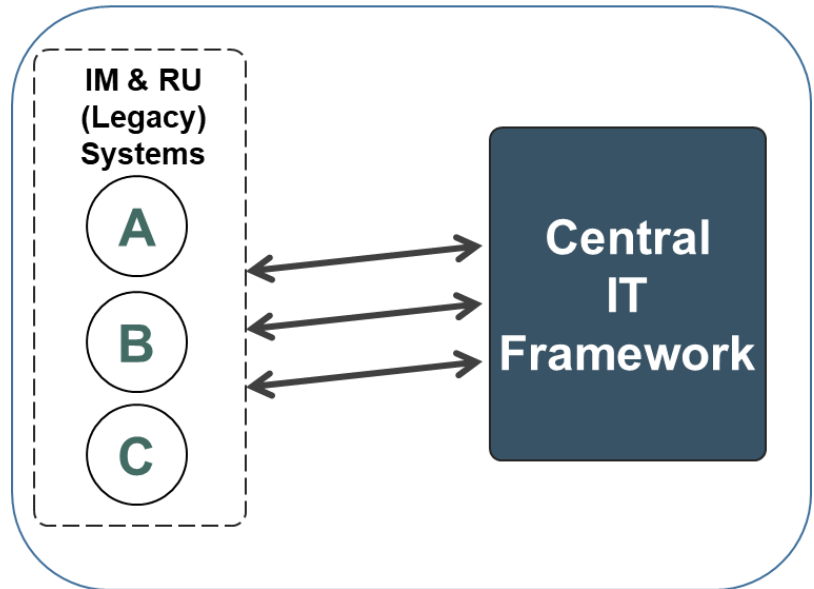
TTR IT Landscape

In addition to implementing specific communication standards, a main pillar of the TTR IT landscape is the use of common data components, using data collected and maintained in the RNE Big Data system.

To serve all required functionalities, the central IT framework is composed of modules, which are arranged in 3 layers.
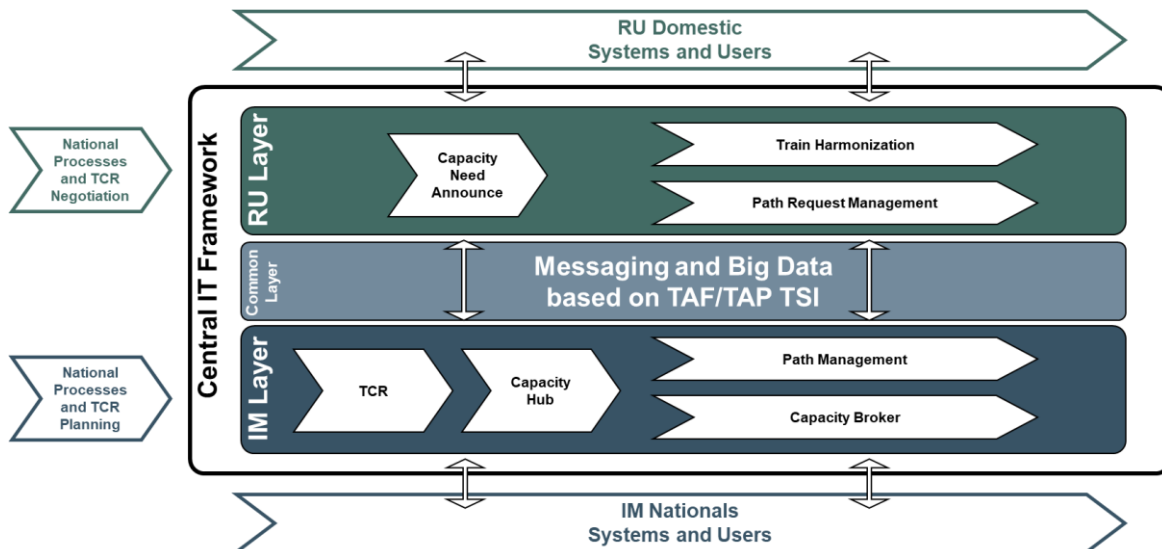
Modules in the IM layer

- <u>TCR (Temporary Capacity Restrictions)</u>: The TCR module collects all available information on planned TCRs in one dedicated space. This helps IMs to coordinate at international level and decrease the negative influence of TCRs on train operation.

- <u>Capacity Hub</u>: The Capacity Hub module collects all data from the IMs/ABs and RUs and provides an overview of available capacity and TCRs in an early stage of planning.
- <u>Capacity Broker</u>: By means of an algorithm, this module checks available capacity against the IMs'/ABs national systems and distributes it according to RUs' requests.
- <u>Path Management</u>: The Path Management module ensures that international path coordination is done in a harmonised format by all involved parties.
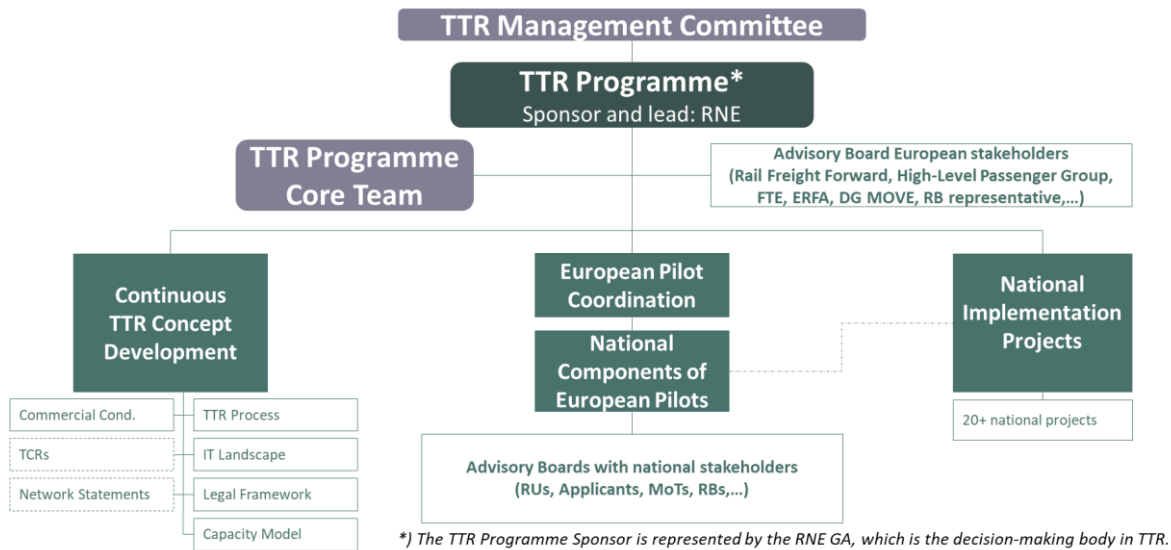
Modules in the RU layer

- <u>Capacity Need Announcements</u>: Using this module, RUs will announce their capacity needs for the upcoming timetable period in advance to help IMs predict the traffic volume for accurate capacity modelling.
- <u>Train Harmonisation</u>: This module will support information exchange on, and harmonisation of, train characteristics (load, weight, length, border handling etc.), train routes and train composition.
- <u>Path Request Management</u>: Using the Path Request Management module, RUs will submit path requests to each IM, using the data harmonised in the Train Harmonisation module.

Modules in the common layer

- <u>Messaging Module</u>:
    - communication between RNE's central systems and the external systems of IMs and RUs
    - router function for external systems of IMs and RUs to communicate with each other
    - based on TAF/TAP TSI standards
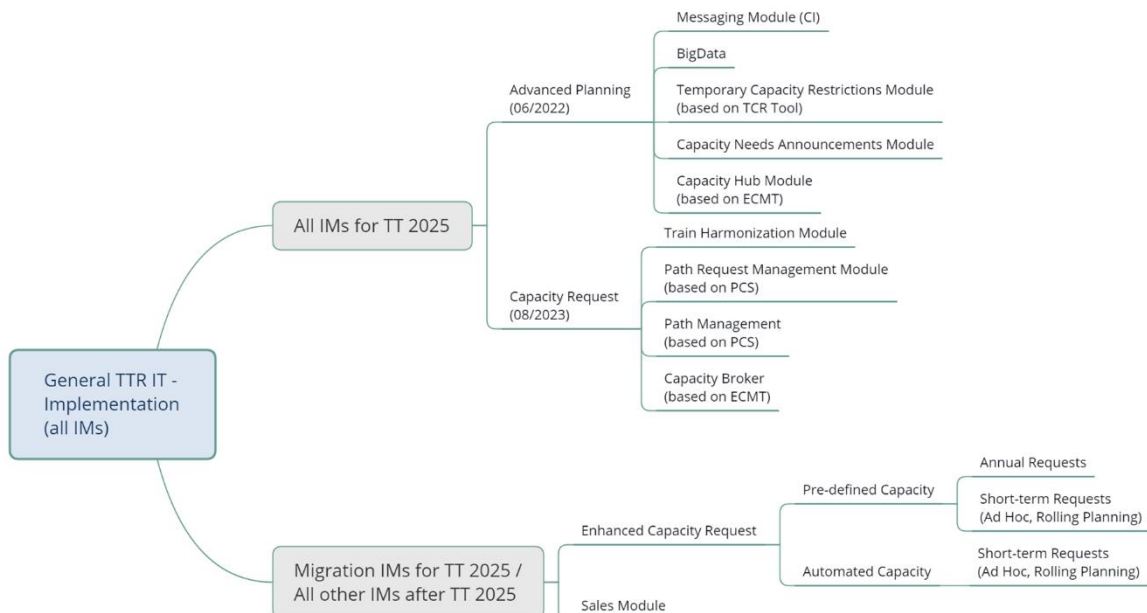
Annex IV: TTR Organization (first ideas/draft)

*) The TTR Programme Sponsor is represented by the RNE GA, which is the decision-making body in TTR.

Main Groups and Boards

Programme Core Team (replacing the TTR Programme Management Office)

- Consisting of TTR programme leader and project leaders (nominated by RNE) as well as an RU representative (nominated by FTE)
- Role:
  o Operational lead of TTR
  o Coordinating funding activities
  o Collecting developments of IMs
  o Coordinating between all groups and teams, including external groups
  o Preparing decisions of changes in the TTR concept
  o Ensuring that all changes to existing items and/or the scope of TTR components proposed within TTR have been subject of discussion in all concerned groups and that the change management procedures are kept
  o Ensure an implementation Plan with evaluated timelines, milestones and concepts

Management Committee (replacing the TTR Steering Committee)

- Consisting of IMs/ABs represented in the first wave of implementation (nominated by these IMs/ABs), RNE MB members in charge of TTR and three representatives of RUs (representing passenger and freight RUs) nominated by FTE.
- Role:
  o Management of the overall TTR programme
  o Steering and pre-approval of decisions on general direction of TTR/strategy by applying all agreed change management procedures.
  o The competence of final approval lies with the RNE General Assembly as representative of the programme sponsor.

European Advisory Boards

- Consultation and feedback on TTR developments and further requirements
- Consultation before any pre-approval by the Management Committee

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Project "Continuous TTR Concept Development"

- This project deals with all overall changes and updates of the TTR concept (e.g. process descriptions, IT modules)

Project "European Pilot Coordination"

- To steer all TTR pilots on European level, harmonize attempts, find common solutions for general obstacles.

Project "National Components of European Pilots"

- To provide all framework conditions and basics for the national execution of the pilots, such as resources, budgets, IT, etc.

Project "National Implementation Projects"

- Full implementation of TTR on national level in all countries (i.e. existing national projects).