

Efficient use of railway capacity through recasting of the timetabling process: The TTR program to recast and harmonize the European timetabling processes.

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Session background and objective

The social focus on the increasing the modal share of rail transport is gaining more and more attention on the political scene in the recent years. The success of the modal shift of as many passenger and goods towards greener modes is crucial for the achievement of the EU Green Deal target. However, the current process(es) for capacity planning and management strive to meet the real market needs, resulting in a harder competition towards other means of transport, e.g., road and air traffic. The rail transport market is becoming increasingly variegated, demanding for different approaches, often in contraposition. On the one side, fixed passenger traffic, with it being on PSO or on Open Access, demands for advanced planning to guarantee early ticket sale and be competitive against air traffic. On the other side, freight traffic is typically much more variable and demands for higher flexibility. In addition, other non-traffic-related forms of capacity consumption, namely capacity restrictions for maintenance or new building projects, reduce the availability of the rail infrastructure and are difficult to plan long in advance.

To overcome these constraints, Railway Undertaking apply typically for more capacity than what is really used in the end. This is mainly to provide some buffer for the internal planning. Freight RUs, for example, might apply for capacity related to tenders that are not finalized yet to be able to place their own bid. The overall result is a sub-optimal plan, where the largest share of freight paths allocated in the Annual Timetable is cancelled, modified, or re-applied for in other forms. The share of capacity that is cancelled is difficult re-allocate, as it hardly meets other operators' needs, which introduces a considerable waste of capacity. The issue is even larger for international rail traffic, where applications need to fit different, non-fully harmonized, planning processes from different Infrastructure Managers.

The unions of European rail Infrastructure Managers RailNetEurope (RNE) and of European railway Undertakings Forum Train Europe (FTE) are introducing a program for the Redesign of the International Timetabling Process, "TTR for Smart Capacity Management" [1]. The program includes a series of projects to simplify, unify, and solidify improvements to the European rail timetabling system. These project span from process change management to capacity analyses at different levels of detail, passing by IT systems architecture to support the processes and market behavior management through commercial conditions and legal framework.

The aim of this special session is to present the TTR project as a whole, to illustrate Banedanmark's involvement in the project in collaboration with the Scandinavian Pilot partners Trafikverket and Bane NOR. The content of this special session is particularly relevant for external stakeholders that will be involved in the advanced planning of capacity, spanning from the Ministry of Transport to Terminal and Facility operators, and including, among others, neighboring Infrastructure Managers (e.g. Øresundsbro Konsortiet, Sund&Bælt, and Lokaltog), non-Railway-Undertaking-applicants (e.g. freight-forwarders or large freight

companies, or event passenger tour operators), passenger and freight Railway Undertakings. All the stakeholders will have a role and a new voice in the planning process, where the harmonization of different needs will be the tool to reduce waste of capacity and improve the railway system efficiency.

Themes and presentations

Here below a list of planned and potential presentations to be held in the special session

Introduction to the TTR Programme, Jelena Soskic – Banedanmark

Jelena Soskic is the National Plan Implementation Manager for Banedanmark. Jelena will host the special session and will introduce the TTR program to the audience, including the main aspects, background and aim of the program.

A renovated timetabling process starting already 5 years ahead of the timetable, Bernd Schittenhelm – Banedanmark

Bernd Schittenhelm participates Banedanmark's Process working group. In collaboration with corresponding teams from other Infrastructure Managers, the group has been working from the start of TTR to redesign the whole timetabling process, define deliverables along the way, interactions with stakeholders, and harmonization procedures between neighboring Infrastructure Managers. Bernd will present the renovated timetabling process according to TTR and the rollout plan towards the full implementation [2].

The Scandinavian collaboration and Banedanmark's first experiences, Fabrizio Cerreto – Banedanmark

Fabrizio Cerreto is project manager for the Scandinavian Pilot, a collaboration with Trafikverket and Bane NOR focusing on the early implementation of TTR and specific elements of the process. The pilot group has so far focused on the preparation and harmonization of the so-called Capacity Strategy and Capacity Model documents, which present the long-term capacity plans at different stages. The Capacity Strategy published for 2025 [3] will be presented alongside the preparatory work for the Capacity Model for cross-border traffic. In particular, the Capacity Model introduces a new challenge in combining scientific methods and industrial needs of simplicity in representing the railway capacity availability and usage. Methods inspired by the UIC-406 leaflet [4] will be presented, where simplicity of representation and communication to non-rail-experts is a success factor.

A new type of players: non-RU applicants, Christina Qwist Frank – Technical University of Denmark and Banedanmark

Christina Qwist Frank is an MSc student at DTU Design & Innovation working also at Banedanmark in the TTR group. Christina led a working group of students who elaborated a project for the course Advanced Engineering Project, Program and Portfolio Management, defining a new process to identify and reach out to new potential applicants that currently do not have deep knowledge and participation in the railway system. These stakeholders are particularly difficult to involve in the process as they do not have a tradition for planning of railway capacity, and might see it more challenging than beneficial, especially when planning for long-term capacity usage. The project will present methods to identify the new stakeholders for the future and to involve them in the planning of capacity, expressing their actual needs, and making the rail transport mode more attractive.

The Terminal and Facility Operators new role in the advanced capacity planning, TBD from TX Logistik and/or DB Cargo (optional)

Terminal and Facility Operators do have knowledge of the Railway System. These stakeholders will have indeed a new role in the capacity planning, as they will have the chance to share their traffic plans with the Infrastructure Manager already 5 years ahead of the annual timetable and will have therefore an influence on the capacity planning. Their challenge will expectably be in finding the right quantity and quality of information to share, balancing the possibility to shape the future infrastructure capacity and the industrial advantage towards their own competitor. Guest speakers will be invited from TX Logistik and/or DB Cargo

Supporting IT architecture (optional), Tobias Thorup – Banedanmark

The process change will need the support of IT system to facilitate the communication within Banedanmark and from/to the surroundings at different levels. The Infrastructure Manager will have to provide information on the infrastructure and the capacity plans at different levels of detail according to the

planning phase. Capacity applicants will have to submit their requests or to express their expected capacity needs in due time to prepare the Capacity Model. Different IMs will need to communicate and coordinate different path proposal, together with capacity restriction plans [5]. Tobias Thorup, leader of the TTR IT working group within Banedanmark, will illustrate the challenges in the architecture shift from several disconnected systems, to a group of systems coordinated with each other and in constant communication. The interplay with the Danish Signaling Programme will be shown, so that the flow from the first plan for capacity utilization to the actual scheduled paths will be clarified.

References

- [1] RailNetEurope, "TTR," 5 April 2022. [Online]. Available: <https://ttr.rne.eu/>.
- [2] RailNetEurope, "Description of the Timetabling and Capacity Redesign Process," 07 December 2021. [Online]. Available: <https://cms.rne.eu/ttr-documents/content/process-description>. [Accessed 5 April 2022].
- [3] Banedanmark, Trafikverket, Bane NOR, "Capacity Strategy 2025," TTR Scandinavian Pilot, 2022.
- [4] UIC, "UIC CODE 406 - Second edition," International Union of Railways, Paris, France, 2013.
- [5] RailNetEurope, "TTR IT Landscape - Technical Specification," 17 March 2022. [Online]. Available: <https://cms.rne.eu/ttr-documents/content/ttr-it-landscape>. [Accessed 5 April 2022].