

Timetabling and Capacity Redesign (TTR)

European Framework for Allocation Principles for Capacity Shortages

Version 0.8



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Introduction

The upgrade of the outdated capacity management processes in the second decade of the 21st century and the TTR implementation requires also the change in the allocation principles when the capacity shortages have to be solved. TTR envisages further harmonisation of the allocation principles between European states, but same important is to find a joint approach how to tackle capacity shortages in the TTR advance planning phase, where no capacity requests are placed yet. This document describes the wished general framework for future European allocation principles, as elaborated jointly by the RUs and IMs. The framework is built around three main concepts:

- RUs-IMs iterative dialogues to find a solution acceptable for all involved parties,
- TCR planning not separated from the timetabling,
- More economical, effective approach for the last resort allocation rules – based on the socio-economic model (inspiration from the rules applicable in SE/NO for ATT conflicts), instead of current national priority traffic type lists.

The document does not aim to provide the econometric model itself, nor the entry values. Nonetheless, the process and market needs to be reflected in the model are listed.

Versioning

Version	Responsible	Date	Description
0.1	Floraine Stauffer (TVS)	30 November 2021	Initial proposal for Capacity Model phase based on the first IM-RU workshop (10.11.2021)
0.2	Daniel Haltner (RNE) Sebastian Naundorf (FTE)	19 January 2022	Simplification of the document. Inclusion of proposal from the RU workshop.
0.3	Sebastian Carek (FTE) Floraine Stauffer (TVS)	26 January 2022	Incorporation of the remarks of the IM-RU task force (25.01.2022)
0.4	Sebastian Carek (FTE) Daniel Haltner (RNE)	25 April 2022	Proposal based on the discussion in the IM-RU task force (25.01.2022) and project team meetings. Design upgrade.
0.5	Floraine Stauffer (TVS) Daniel Haltner (RNE)	11 May 2022	Inclusion of inputs from Task Force Meeting (11.05.2022)
0.6	Floraine Stauffer (TVS) Daniel Haltner (RNE)	14 June 2022	Inclusion of a proposal for an extended time line for the execution of a socio-economic analysis
0.7	Sebastian Carek (FTE) Floraine Stauffer (TVS)	25 Aug 2022	Inclusion of the remarks submitted. Inclusion of the ATT part for the purpose of the study evaluation.
0.8	Floraine Stauffer (TVS) Daniel Haltner (RNE)	13 September 2022	Inclusion of inputs from Task Force Meeting (6.09.2022)

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1. Capacity shortages in advance planning

This chapter describes the capacity optimisation and decision-making process in case a capacity shortage is identified during the Capacity Model and Planning/Supply phases. However, the process will not solve capacity shortages. It will provide a solid ground for decision making in case of identified capacity shortage.

1.1. Capacity shortage solving sequence in advance planning

When a capacity shortage is detected, this process should be triggered as soon as possible. Once a satisfactory solution/alternative is achieved, the process ends. Once IMs detect a capacity shortage based on CNA and TCR input, the situation has to be analysed and an acceptable solution found between the affected stakeholders and, where applicable, TCR planning. This includes the **development of various potential scenarios** (by all involved IM departments: timetabling and asset management) for the periods with the capacity shortage. The **principle of subsidiarity** is to be applied: if possible, the stakeholders should attempt to solve the capacity shortage on the local/national level without involving a wider number of stakeholders.

The following capacity shortage solving sequence is to be applied:

1.1.1. Dialogue between IM and affected CNA submitters

In the first place, the IMs outline **different scenarios of using the available capacities** for the periods with capacity shortage (preparation of Capacity Models and Planning/Supply variants). It is important to distinguish between periods with or without capacity shortages. Then, these scenarios will be used by the IMs to discuss the issue with the affected CNA submitters and try to solve the problem. The IM can propose an alternative that might be suitable for the affected CNA submitters without the involvement of all affected stakeholders (e.g. fewer freight volumes during the peak hours compensated by more slots off-peak).

1.1.2. Capacity shortage round-table

The second step is the capacity shortage round-table, a dialogue between IMs and all affected CNA submitters (and interested applicants after the draft capacity model publication). If a stakeholder wishes to stay anonymous, the IM may present its interest in the round-table. Nevertheless, **only capacity shortage-relevant information is shared** to protect the commercial interest of applicants. In cases where capacity proposed for a TCR execution is part of the issue, the **competent departments shall be presented** as well (mandated to adjust the TCR plan).

1.1.3. Socio-economic capacity partitioning

Only in cases when iterative capacity shortage round-tables have not led to a satisfactory solution, the socio-economic criteria should be applied. The **socio-economic values of different scenarios** (not individual CNAs and TCRs) **are compared**, the scenario with the highest value for the society is used for the capacity partitioning.

The socio-economic formula shall be transparently published in the Network Statement. The criteria (variables) in the formula should be the same for whole Europe.

1.1.4. International escalation level

If the application of the socio-economic criteria leads to inconsistent national traffic priorities for cross border capacity and/or unsynchronised TCRs, the stakeholders can apply to an international entity¹ of last resort. The entity shall issue a transparent decision on the Capacity Model/Capacity Supply with the consistent and internationally harmonised result. This shall also be based on common socio-economic criteria. However, the weighting does not have to reflect the national ones. Also, these weightings need to be transparent and commonly agreed on the European level.

1.2. Timeline of the advance planning

X ² -36	Start of the Capacity Model phase.
X-26	Latest deadline for IMs to inform applicants about significant TCRs with major/high impact if they wish that the CNAs consider them. The CNA process is triggered by IMs.
X-24	The regular deadline to submit CNAs.
X-24 to X-21	<ul style="list-style-type: none"> • IMs detect congestion, applicants are available for further questions. • Dialogues between IM and affected CNA submitter(s) take place. • Capacity shortage round-tables are organised well before the deadline (to be defined after the first experiences).
X-21	Deadline to publish draft Capacity Models and make them available for all potential applicants.
X-21 to X-19	If requested by potential applicants, further capacity shortage round-tables are organised in the event that Draft Cap. Models lead to disagreement
X-19	Latest date to start the carrying out of a case-related socio-economic analysis by IM(s) as a last resort in case the capacity shortage round-tables have not led to a satisfactory outcome for all parties involved (But not earlier than X-21).
X-18,75	Reconciliation of the national results of the socio-economic analyses in case a cross-border line is concerned.
X-18,5	The socio-economic analysis is made available to the involved/interested parties.
X-18,5 to X-18	In case that stakeholders detect an inconsistency between Cap. Models of a cross-border line where the socio-economic approach was applied, stakeholders can appeal to an International Leading Entity. For details see point 1.1.4.
X-18	Deadline to publish the final Capacity Models by taking the result(s) of the socio-economic analysis into account.
	Start of the Capacity Planning/Supply phase.
X-18 to X-13	<ul style="list-style-type: none"> • IMs detect congestion, applicants are available for further questions. • Dialogues between IM and affected CNA submitter(s) take place.

¹ For example, a dedicated entity at European level with responsibility in capacity management and allocation

² X = Timetable change; example X-36 for TT 2026 = Dec. 2023

	Capacity shortage round-tables are organised well before the deadline (to be defined after the first experience).
X-13	Deadline to publish draft Capacity Supply and make it available for all potential applicants.
X-13 to X-11	Further capacity shortage round-tables are organised in case the capacity shortages persist, interested applicants might join them. At X-xx, the socio-economic comparison of discussed scenarios is made available to the capacity shortage round-table.
X-11	Deadline to publish the final Capacity Supply and apply the socio-economic principles in case no consensus is reached.

The early planning referred to the TTR Capacity Model and Capacity Planning/Supply phases.

1.3. Decision criteria for the Capacity Models

This subchapter provides a list of business-driven requirements, which should be reflected in the socio-economic formula to calculate the value of each concerned scenario of the Capacity Model. The weight of each criterion (variable) would be set according to the national priorities.

1.3.1. Criteria for traffic volumes in Capacity Model

- Transport distance
(volumes with CNAs should be counted from the origin to the destination)
- Standardised cost of excluded traffic volume (per traffic type, includes also the modal shift risk and environmental impact)
- Standardised cost of displaced traffic volume (per traffic type, includes also the modal shift risk and environmental impact, furthermore the technical constraints e.g., re-routing of electricity-hauled rolling stock to non-electrified line, includes also displacement due to the TCR re-routing). Standardised costs for exceeding running time (realistic wished times; volumes with CNA)
- Line coefficient – multiplication of traffic type weight per specific line
(e.g., specific freight lines can give higher costs to freight, high-speed lines to passenger. This is to ensure that the purposes of the investments are taken into account)
- Costs of lost association – (per hour for next slot and traffic type to the extent visible in Capacity Models)
 - Passenger: lost connection or lost integrity and regularity of service³
 - Freight: lost feeder and or outflow (rail or multimodal)
- Priority bonus for international traffic (driven by higher effort and costs to organise)
- Priority bonus for traffic type in a specific period
 - Passenger: for instance, bonus for the peak hours
 - Freight: for instance, bonus for off-peak hours and night period
- Framework agreements (FA not respected by the IM, multi-annual Rolling Planning, maybe a differentiation between foreseen RP capacity and already “committed” RP capacity is needed)

The proposed standardised traffic categories are in Annex A.

1.3.2. Criteria for TCRs in Capacity Model

To utilise the existing European capacities in an economic and efficient manner, it is essential that TCR timing is not only fixed by IMs and thus closed for potential evaluation of better alternatives.⁴ In the Capacity Model phase, this is especially relevant for the Major/High impact TCRs that during the execution days do

³ This can be based on the clock face pattern. This provision shall not be an obstacle for competition on the market where allowed, but to contribute to homogenous timetables. This criterion should reflect the national policies even in a combination.

⁴ This can mean different timing, but also a different way of the TCR execution (for instance longer period of partial closure against shorter period of total closure)

not cover all 24 hours of the day, or TCRs that are executed on lines with noticeable seasonality. The aim is to find a cost-efficient solution acceptable for both IMs and RUs. Within the evaluation of the socio-economic, the impact on the TCR planning and traffic volumes is calculated together. The economic impact shall be considered for both sides, the criteria for a TCR should consider:

- Extra costs for IMs to execute the TCR in the proposed period compared with the IM-lowest-cost baseline or
- Extra costs for IMs to execute the TCR in a different way (longer time period vs total closure; night vs day etc)

1.4. Decision criteria for the Capacity Planning/Supply phase

This subchapter provides a list of business-driven requirements, which should be reflected in the socio-economic formula to calculate the value of each concerned scenario of the Capacity Supply. The weight of each criterion (variable) would be set according to the national priorities.

1.4.1. Criteria for traffic volumes in Capacity Planning/Supply phase

- Transport distance (paths/slots with CNAs should be counted from the origin to the destination)
- Standardised cost of excluded path/slot (per traffic type, includes also the modal shift risk and environmental impact)
- Standardised cost of displaced path/slot (per traffic type, includes also the modal shift risk and environmental impact, furthermore the technical constraints e.g., re-routing of electricity-hauled rolling stock to non-electrified line)
- Cost for exceeded maximum running time (paths/slots with CNA only)
- Line coefficient – multiplication of traffic type weight per specific line (e.g., specific freight lines can give higher costs to freight, high-speed lines to passenger)
- Costs of lost association, Turnover time for both rolling stock, locos and HR – (per minute for next slot and traffic type to the extent visible in Capacity Supply)⁵
 - Passenger: lost connection or lost integrity and regularity of service⁶
 - Freight: lost feeder and or outflow
- Priority bonus for international traffic (driven by higher effort and costs to organise)
- Priority bonus for traffic type in a specific period
 - Passenger: for instance, bonus for the peak hours
 - Freight: for instance, bonus for off-peak hours and night period
- Framework agreements (FA not respected by the IM, multi-annual Rolling Planning)

The difference of the criteria for traffic volumes in the Cap. Planning/Supply phase in comparison with the criteria for the Cap. Model

The proposed standardised traffic categories are in Annex A.

1.4.2. Criteria for TCRs in Capacity Planning/Supply phase

To utilise the existing capacity in economic and efficient manner, it is essential that TCR timing is not fixed by IMs and thus closed for potential evaluation of better alternatives. In the Capacity Planning/Supply phase this is relevant for the Major/High/Medium impact TCRs and TCR window. In case the remaining capacity is not sufficient to accommodate all the applicant and IM needs and the consultation does not lead to an acceptable result, an evaluation of different Capacity Planning/Supply scenarios can be considered, the impact on the TCR (or combination of TCRs) and the paths/slots is calculated together. The aim is to find a cost-efficient solution acceptable for both IMs and applicants. The economic impact shall be considered for both sides, the criteria for a TCR should consider:

⁵ A lost association should also consider the turnover – and association with the return journey slot. This consideration would depend on the form of the Capacity Supply.

⁶ This provision shall not be an obstacle for competition on the market where allowed, but to contribute to homogenous timetable.

- Extra costs for IMs to execute the TCR in proposed period compared with the IM lowest cost baseline or
- Extra costs for IMs to execute the TCR in a different way (longer time period vs total closure; night vs day etc)

2. Capacity conflicts in the Annual Timetable

2.1. Capacity shortage solving sequence in Annual Timetable

When a capacity shortage is detected, this process should be triggered as soon as possible. Once a satisfactory solution/alternative is achieved, the process ends. Once IMs detect a capacity shortage based on CNA and TCR input, the situation has to be analysed and an acceptable solution found between the affected stakeholders and, where applicable, TCR planning. This includes the **development of various potential scenarios** (by all involved IM departments: timetabling and asset management) for the periods with the capacity shortage. The **principle of subsidiarity** is to be applied: if possible, the stakeholders should attempt to solve the capacity shortage on the local/national level without involving a wider number of stakeholders.

The following capacity shortage solving sequence is to be applied:

2.1.1. Dialogue between IM and affected applicants

In the first place, the IM discusses the issue with the affected applicants and tries to solve the problem bilaterally. The IM can propose an alternative that might be suitable for one of the affected applicants without the involvement of other one.

2.1.2. Conflict round-table

The second step is the conflict round-table, a dialogue between IMs and all affected applicants. If an applicant wishes to stay anonymous, the IM may present its interest in the round-table. Nevertheless, **only conflict-relevant information is shared** to protect the commercial interest of applicants.

The IMs outline **different path scenarios of using the available capacities**.

2.1.3. Socio-economic capacity partitioning

Only in cases when iterative capacity shortage round-tables have not led to a satisfactory solution, the socio-economic criteria should be applied. The **socio-economic values of different scenarios** (not individual CNAs and TCRs) **are compared**, the scenario with the highest value for the society is used for the capacity partitioning.

The socio-economic formula shall be transparently published in the Network Statement. The criteria (variables) in the formula should be the same for whole Europe.

2.1.4. International escalation level

If the application of the socio-economic criteria leads to inconsistent national traffic priorities for cross border capacity and/or unsynchronised TCRs, the stakeholders can apply to an international entity⁷ of last resort. The entity shall issue a transparent decision on the Capacity Model/Capacity Supply with the consistent and internationally harmonised result. This shall also be based on common socio-economic criteria. However, the weighting does not have to reflect the national ones. Also, these weightings need to be transparent and commonly agreed on the European level.

⁷ For example, a dedicated entity at European level with responsibility in capacity management and allocation

2.2. Timeline for the Annual Timetable

X-8.5	Path request deadline
X-xx	<ul style="list-style-type: none"> • IMs detect the conflicting capacity needs, applicants are available for further questions. • Dialogues between IM and affected CNA submitter(s) take place. • Conflict round-tables are organised well before the deadline (to be defined after the first experiences). • At X-xx, the socio-economic comparison of discussed scenarios is made available to the conflict round-table.
X-xx	The draft offer deadline

2.2.1. Criteria for traffic volumes in Annual Timetable

- Transport distance (paths/slots with CNAs should be counted from the origin to the destination)
- Standardised cost of excluded path/slot (per traffic type, includes also the modal shift risk and environmental impact)
- Standardised cost of displaced path/slot (per traffic type, includes also the modal shift risk and environmental impact, furthermore the technical constraints e.g., re-routing of electricity-hauled rolling stock to non-electrified line)
- Cost for exceeded maximum running time (paths/slots with CNA only)
- Line coefficient – multiplication of traffic type weight per specific line (e.g., specific freight lines can give higher costs to freight, high-speed lines to passenger)
- Costs of lost association, turnover time for both rolling stock, locos and HR – (per minute for next slot and traffic type to the extent visible in Capacity Supply)⁸
 - Passenger: lost connection or lost integrity and regularity of service⁹
 - Passenger traffic coefficient based on the rolling stock capacity and average occupancy.
 - Freight: lost feeder and or outflow
- Priority bonus for international traffic (driven by higher effort and costs to organise)
- Priority bonus for traffic type in a specific period
 - Passenger: for instance, bonus for the peak hours
 - Freight: for instance, bonus for off-peak hours and night period
- Framework agreements (FA not respected by the IM, multi-annual Rolling Planning)

The proposed standardised traffic categories are in Annex A.

2.2.1. Criteria for TCRs during the ATT construction and after the path allocation

To utilise the existing capacity in economic and efficient manner, it is essential that TCR timing is not fixed by IMs and thus closed for potential evaluation of better alternatives. This situation might happen during the ATT construction (e.g. new TCR after the draft offer) and after the allocation). In case a new (minor or late) TCR is proposed – the TCR can affect the allocated traffic or the draft offers. The socio-economic model for these situations should help to identify the optimal scenario, in case the remaining capacity is not sufficient to accommodate all the applicants’ needs and the consultation does not lead to an acceptable result for stakeholders. The impact of the new TCR (on the IMs) and the path alterations/withdrawals (impact on the applicants) is calculated together. The aim is to find a cost-efficient solution acceptable for both IMs and applicants. The economic impact shall be considered for both sides, the criteria for a TCR should consider:

⁸ A lost association should also consider the turnover – and association with the return journey slot. This consideration would depend on the form of the Capacity Supply.

⁹ This provision shall not be an obstacle for competition on the market where allowed, but to contribute to homogenous timetable.

- Extra costs for IMs to execute the TCR in proposed period compared with the IM-lowest-cost baseline or
- Extra costs for IMs to execute the TCR in a different way (longer time period vs total closure; night vs day etc)

Annex A: Proposed standardised traffic categories

The standardised traffic categories defined below are based on the categories identified in the Handbook Capacity model.

Passenger traffic

	Peak period	Off-peak period
High-speed		
Long-distance		
Express regional / Commuter		
Regional standard		
Night train		
Excursion trains and others		

Freight traffic

	Just-in-time (time sensitive transport)	Flexible (Transport for which flexibility is more important than short transport time)	Regularity
Wagonload			
Block train			
Intermodal (combined transport)			