



## **Procedures for Capacity Supply**

Complementary document (handbook) to Description of the Timetabling and Capacity Redesign Process

**Version 1.0**

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## Version history

VERSION	RESPONSIBLE	DATE	CHANGES
0.1	<p>Ádám Kertai Head of Capacity Process Management</p> <p>Ádám Pintér Capacity Supply &amp; TCR Manager</p>	01-09-2022	<p>Creation of the initial version based on the “Description of the Timetabling and Capacity Redesign Process Version 3.0”</p> <p>&amp;</p> <p>Remarks from the TTR Process Group (2021 and 2022)</p>
0.2	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p> <p>Ádám Kertai Head of Capacity Process Management</p>	29-10-2022	<p>Inclusion of remarks which have been submitted after the TTR PG (20/21 Sept 2022) and from the Q and A sessions.</p> <p>General finetuning of the document</p>
0.3	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p> <p>Ádám Kertai Head of Capacity Process Management</p>	28-11-2022	<p>Inclusion of the outcomes from the TTR PG (15/16 Nov 2022)</p>
0.4	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p> <p>Ádám Kertai Head of Capacity Process Management</p>	15-12-2022	<p>Inclusion of the outcomes from the TTR PG (12/13 Dec 2022)</p>
0.5	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p> <p>Ádám Kertai Head of Capacity Process Management</p>	16-01-2023	<p>Inclusion of the outcomes from the previous TTR meetings, comments and discussions.</p>
0.6	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p> <p>Ádám Kertai Head of Capacity Process Management</p>	06-02-2023	<p>Inclusion of the outcomes from the TTR PG (01/02 Feb 2023)</p>
0.7	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p> <p>Ádám Kertai Head of Capacity Process Management</p>	24-10-2023	<p>Inclusion of the outcomes from the</p> <ul style="list-style-type: none"> <li>• TTR PG (01/02 Mar 2023)</li> <li>• TTR PG (03/04 May 2023)</li> <li>• TTR PG (15 Jun 2023)</li> <li>• TTR PG (12/13 Sept 2023)</li> <li>• ACP WG (04/05 Oct 2023)</li> </ul>
0.8	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p>	16-11-2023	<p>Inclusion of the outcomes from the</p> <ul style="list-style-type: none"> <li>• TTR PG (07/08 Nov 2023)</li> </ul>
0.9	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p>	18-12-2023	<p>Finalised based on outcomes from the</p> <ul style="list-style-type: none"> <li>• TTR PG (12/13 Dec 2023) where the group approved the final version</li> </ul>
0.9.1	<p>Ádám Pintér Capacity Supply &amp; TCR Manager</p>	20-03-2024	<p>Inclusion of the outcomes from the</p> <ul style="list-style-type: none"> <li>• Legal Matters WG (13 Mar 2024)</li> <li>• ACP WG (20/21 Mar 2024)</li> </ul>
1.0	RNE General Assembly	16-05-2024	Approval of the version 0.9.1 by the RNE General Assembly on 16 May 2024

## Disclaimer, application and transition period

*This document is intended as a handbook for the implementation of the so-called Capacity Supply of the TTR Process as described by RNE. As neither legislation nor IT-systems are currently adapted to enable all the elements of TTR, individual TTR elements can only be implemented by the infrastructure managers to a limited extent for the upcoming timetable periods, starting in December 2024. If and when the legislation and IT-systems fully enable the implementation of all the elements of TTR, the different RNE handbooks on those elements may be updated accordingly and applied to the process. The exact details for the transitional period are elaborated in the “Scope of TTR for Timetables 2025-2028<sup>1</sup>”.*

Infrastructure Managers and Allocation Bodies may adapt their internal processes and the Network Statement in line with the Procedures for Capacity Supply from X-18, where X denotes the first timetable referring to the complete rollout of TTR. The deadlines defined in 1.4 Timeline for Capacity Supply are applicable after the complete roll-out of TTR Capacity Supply.

Note that the process described in the document does not yet fully reflect the targeted TTR elements; it is expected that the document will be subject to update or refinement. The “Scope of TTR for Timetables 2025-2028<sup>1</sup>” contains the description of the geographical scope, which might be defined differently for the first years of implementation.

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<sup>1</sup> Accesible via: [https://rne.eu/wp-content/uploads/2022/10/scope\\_of\\_ttr\\_for\\_timetables\\_2025-2028\\_v1.0\\_1.pdf](https://rne.eu/wp-content/uploads/2022/10/scope_of_ttr_for_timetables_2025-2028_v1.0_1.pdf)

## Introduction and scope of this document

An essential part of the TTR process is advanced planning. Based on the capacity volumes published in the Capacity Model and additional input provided by the market the Capacity Supply is constructed. The main benefits obtained from a Capacity Supply are first, the transparent overview of 365-days of capacity diagram (positive, negative and unplanned capacity), and secondly, a continuously updated database of paths which can support the path allocation process after X-11 until the end of the related timetable period.

Following the implementation of the Capacity Supply preplanning process, the Capacity Model process could be shortened and completed by X-18. The process steps of Capacity Model defined from X-18 to X-11 could be replaced by the process steps of Capacity Supply defined in this handbook.

This document describes the process by which Infrastructure Managers and Allocation Bodies (hereafter IMs) are expected to prepare the Capacity Supply following the TTR principles. IMs shall follow these procedures in their entirety and harmonise their internal processes in order to promote internationally coordinated capacity management processes over the single European railway area.

## Reference documents

This document follows and is based on the principles set out in the:

- **Description of the Timetabling and Capacity Redesign Process** version 3.0,<sup>2</sup> which includes further description and glossary of terms used in this document.
- **Procedures for Capacity Strategy** version 1.0<sup>3</sup>
- **Procedures for Capacity Model** version 2.3
- **Procedures for Temporary Capacity Restrictions** version 1.0<sup>4</sup>
- Procedures for Feasibility Studies version 1.0

The handbook also deals with matters regulated in:

- **Directive 2012/34/EU**, especially:
  - Article 38(2) on the prohibition to allocate paths beyond 1 TT period (exception framework agreements),
  - Article 39(1) on national frameworks for capacity allocation,
  - Article 40(1) on the cooperation of IMs for efficient creation of infrastructure capacity,
  - Article 40(5) on assessing the need and organizing pre-arranged international train paths for freight trains,
  - Article 42 on framework agreements (capacity reserve for 5 years, subject to exceptions),
  - Article 45 on Scheduling,
  - Article 46 on the Coordination process,
  - Article 48(2) on the reservation of capacity for foreseeable ad hoc requests,
  - Article 53 on infrastructure capacity for maintenance works,
  - Annex VII parts prescribing provisions about the TCR Planning and definition of provisional international train paths.
- **Commission implementing regulation (EU) 2016/545 on framework agreements,**
- **Regulation 913/2010** - Article 14(3) and (5) on pre-arranged paths and reserve capacity.
- **Draft Regulation COM(2023) 443/2** - on the use of railway infrastructure capacity in the single European railway area, amending Directive 2012/34/EU and repealing Regulation (EU) No 913/2010

<sup>2</sup> Accessible via: <https://rne.eu/downloads>

<sup>3</sup> Accessible via: <https://rne.eu/downloads>

<sup>4</sup> Accessible via: <https://rne.eu/downloads>

## 1 Introduction and Framework of the Capacity Supply

This chapter provides an overview of the Capacity Supply content, which consists of a 365-day time/space capacity diagram, where objects are displayed as preplanned Catalogue Paths and/or Bandwidths, with the indication of their flexibility and parameters. Empty spaces are indication for possible tailor-made requests and room for capacity optimisation.

Capacity Model volumes give the basis for the Capacity Supply preparation. The minute-based objects in the Capacity Supply should inherit from the hourly-based volumes of the Capacity Model. Each object should contain information at least on location level. Future development of the Capacity Supply may require a more detailed specification at the location level, details such as tracks and turnouts.

### 1.1 Added value and aim of the Capacity Supply

- Provides a 365-days overview of capacity in a time/space capacity diagram,
- supports the harmonisation of the cross-border capacity planning,
- accelerates and supports the path request phase,
- provides a detailed overview of the available capacity for different ordering periods on a European scale,
- provides harmonised Preplanned Capacity at an international level,
- provides an up-to-date database of capacity as a source of further capacity coordination tools,
- provides detailed capacity availability on TCRs and TCR windows.

### 1.2 Glossary of the Capacity Supply

**Table 1: List of the Capacity Supply definitions**

Capacity Object	Capacity Objects represent different types of Preplanned Capacity with defined characteristics and properties and include capacity available for requests by applicants, capacity reserved for infrastructure works and capacity already allocated.
Preplanned Capacity	Preplanned Capacity Objects of capacity available for requests by applicants indicate the availability on an IM’s line with predefined time parameters. These will be made available for path requests upon publication.
Catalogue Path	A Catalogue Path is a Preplanned Capacity Object that is defined by route and timing, which indicate a particular allocation possibility. A requested Catalogue Path is transformed into a path.
Bandwidth	A Bandwidth represents a Preplanned Capacity Object that is defined by route and a time range. A Bandwidth may leave room for several paths within the same time range, depending on the train characteristics of the path orders placed. A requested Bandwidth is transformed into a path.
Path	A Path is a designated train route allocated according to specific location, time, and train parameters, and is assigned to an Applicant based on their request.
Capacity Product	A Catalogue Path or a Bandwidth that is dedicated for a specific allocation purpose such as ATT, ad hoc or rolling planning which can be requested by Applicants.

Coordination	A procedure through which IMs strive to connect their Capacity Objects by harmonising preplanned capacities at the borders.
Harmonisation	Harmonisation is an iterative and active process between IMs to align Preplanned Capacity at the borders, matching time parameters and train parameters if available for each individual Catalogue Path and/or Bandwidth to the possible extent.
Harmonised border	A border is considered harmonised when the minimum required level defined by this Handbook is satisfied.
Harmonised Capacity Supply	A Capacity Supply is considered harmonised if all of its associated borders have achieved harmonisation.
Consultation	Consultation is a procedure between IMs and Applicants where IMs can introduce the possible pre-arranged scenarios in the Capacity Supply.

### 1.3 List of involved stakeholders and their roles

**Table 2: List of involved stakeholder and their roles**

Stakeholder	Roles and involvement
Applicant	<p>A railway undertaking or an international grouping of railway undertakings or other persons or legal entities, such as competent authorities under Regulation (EC) No 1370/2007 and shippers, freight forwarders and combined transport operators, with a public-service or commercial interest in accessing infrastructure capacity<sup>5</sup> to meet existing or future market demand.</p> <p>In line with the above definition the possible Applicants are the following:</p> <p>RU Applicants: A railway undertaking (RU) or an international grouping of railway undertakings.</p> <p>Non-RU Applicants, for example:</p> <p>Competent authority (e.g. national/local MoT, etc.)</p> <p>Shippers / Freight forwarders</p>
IM	Infrastructure Manager (or Allocation Body) in charge of the Capacity Supply.
Involved IMs	Infrastructure Manager (or Allocation Body) that is or might be concerned in or affected by the particular Capacity Supply.
Operator of service facility	Any public or private entity responsible for managing one or more service facilities or supplying one or more services to railway undertakings referred to in points 2 to 4 of Annex II of Directive 2012/34/EU of the European Parliament and of the Council <sup>6</sup> .

<sup>5</sup> Defined in Art. 3(19) of Directive 2012/34/EU.

<sup>6</sup> Defined in Art 3(12) of Directive 2012/34/EU.

### 1.4 Timeline for Capacity Supply

The following table shows the main milestones in the Capacity Supply phases.

**Table 3: Timeline of the Capacity Supply procedure**

<b>Timeline</b>	<b>Milestone/Action</b>
<b>PHASE I: CAPACITY SUPPLY PREPLANNING PROCESS</b>	
X-18	Final Capacity Model is published, preplanning phase of Capacity Supply starts.
From X-18	Possibility for the Applicants to place feasibility study requests for new traffic for Annual Timetable. According to the Procedures for Feasibility Studies, the IMs can only provide an answer (positive or negative) until X-9, if the Leading Applicant places the feasibility study request before X-10.
X-18 - X-15	Applicants can submit additional information on their need to the IMs.
X-13.5	IMs have to provide information to the Applicants on sections with potential high utilisation of capacity. The same level of detail as in the final Capacity Supply are expected for the sections which are presented at this time.
X-12.5	Applicants may comment on the information shared by IMs on sections with potential high utilisation of capacity.
X-18 - X-11	Preparation and coordination of the Capacity Supply for non-TCR, TCR Window and Major and High impact TCR period.
X-11	Publication of the internationally harmonised Capacity Supply including non-TCR, Major and High impact TCR and TCR window periods. Containing at least those TCRs which had been already included in the Capacity Model.
<b>PHASE II: CAPACITY SUPPLY INTERMEDIATE PROCESS</b>	
X-11 – X-9	The Applicants may comment on the published Capacity Supply (e.g. errors or inconsistencies) which can be elaborated at the latest during the path allocation phase. These comments should focus generally on the Capacity Supply and border harmonisation, and its consistency with the Capacity Model, not on certain paths (for that the Observation Phase in the Path Allocation Handbook applies).
X-6.5	The representation of the Draft Timetable appears in a Capacity Supply format (time-space diagram).
<b>PHASE III: CAPACITY SUPPLY UPDATING PROCESS</b>	
X-5.25 – X+12	After the final allocation, the Capacity Supply is continuously updated with the inclusion of allocated paths and additional known TCRs to reflect the current capacity availability.



## 1.5 Geographical scope

It is important to define and standardise the geographical area of the Capacity Supply in order to achieve a clear and common goal to boost international path harmonisation. By default, every railway line should be part of the Capacity Supply (during the initial implementation of TTR, the geographical scope of the Capacity Supply might differ). An exception can only be applied if a line is covered by the exemptions in Directive 2012/34. Low traffic can be estimated – for example – on the basis of the submitted CNAs, IMs' own analysis (e.g. low traffic means one path in every second hour). However, when a line is designated as an alternative route due to major, high or medium impact TCRs, the IM should prepare Capacity Supply at least for the TCR periods on this line.

## 1.6 Source of input

IMs should use different sources for inputs to prepare or update a Capacity Supply.

Before the publication of the Capacity Supply (before X-11):

- **Capacity Model:** Final Capacity Model is published by IMs at X-18, which contains hourly-based traffic volumes, eventually considering major and high impact TCRs.
- **Major and High impact TCRs with their specific consequences for the capacity planning.**
- **Multi-annual Rolling Planning requests<sup>7</sup>:** Rolling Planning requests placed already by applicants in the previous or running timetable period that is supposed to have running days also in the timetable period that is subject to capacity modelling.
- **Additional needs from the market:** Applicants can submit additional information on their need to the IMs.<sup>8</sup> See chapter 2.4 Consultation of the Capacity Supply.
- **Feasibility studies:** Feasibility studies for new traffic (e.g. needs that have not been previously announced). See chapter 2.4 Consultation of the Capacity Supply.
- **Framework agreements** to the extent that the confidential information contained therein is not compromised.

After the publication of the Capacity Supply (after X-11):

- **Final Capacity Supply:** The Final Capacity Supply will serve as a basis for the update.
- **Feasibility studies:** Feasibility studies for new traffic (e.g. needs that have not been previously announced).
- **Allocated paths:** All allocated paths should be included continuously until the end of the related timetable period to indicate the remaining available capacity on the Capacity Supply time-space diagram.

Each of the inputs should be taken into consideration by the IMs in order to construct Capacity Supplies with a view to enabling a minimum capacity per market segment such as different sorts of freight services, passenger services within the framework of a public service contract and other passenger services. The IMs should share the result of their evaluation with the market and consider their feedback to the extent possible.

<sup>7</sup> Depending on the completion of the finalised Rolling Planning procedure.

<sup>8</sup> TTR PG (1<sup>st</sup> March 2023): Intermediate solution: later on we need a structured way how Applicants can submit their needs with the technical solution (involvement of IT will be needed).

### 1.7 Definition of Capacity Objects

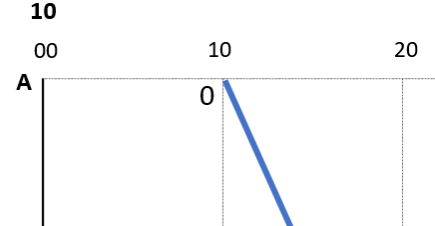

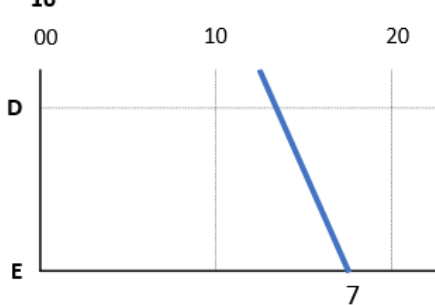
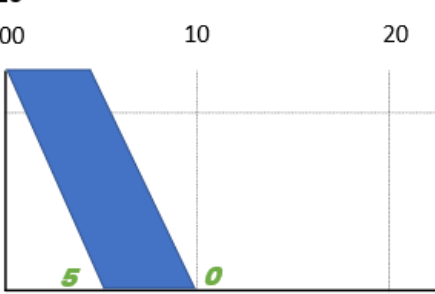
To define a Capacity Object, IMs have to indicate minutes-based time data at each location on the route of the Capacity Object and define train parameters using TAF/TAP TSI standards. For train parameters, see chapter 2.2 Content of the published Capacity Supply.

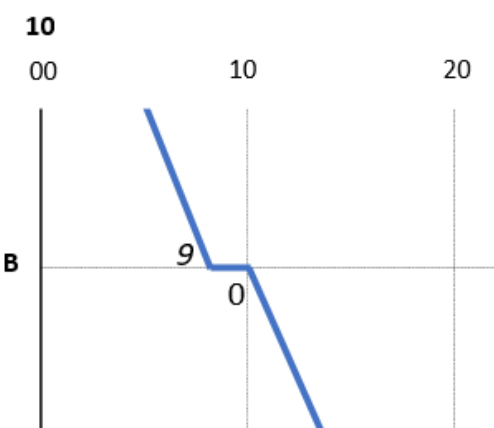
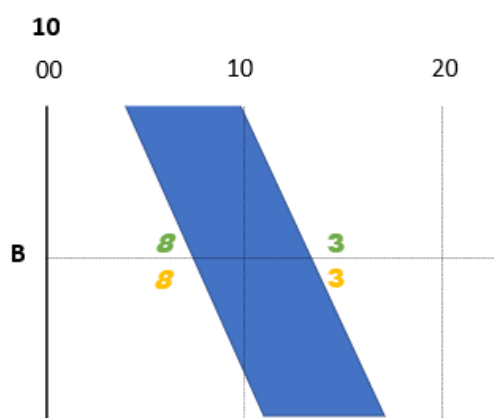
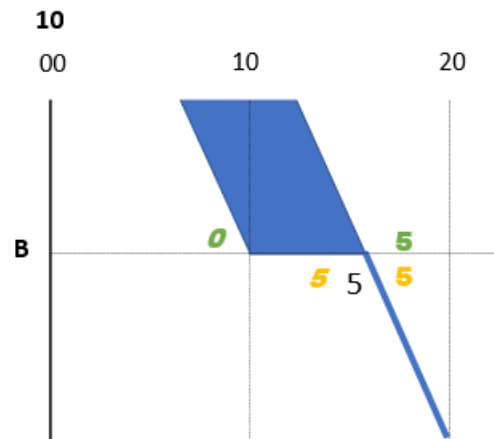
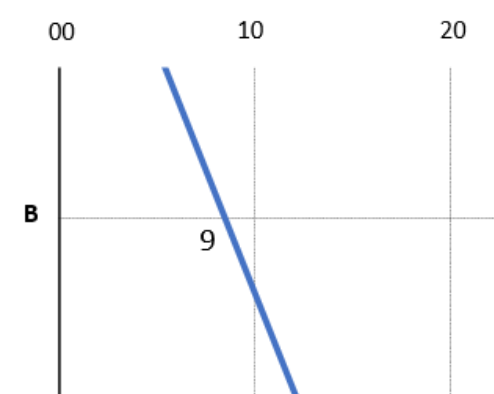
A Capacity Object can be defined in two ways, which depends on the desired level of detail:

- by Catalogue Path, specifying only actual arrival and actual departure time,
- or by Bandwidth, specifying earliest arrival, earliest departure, latest arrival and latest departure time, indicating a range of time.

Different approaches for Capacity Object definition are shown in Table 4.

**Table 4: Different approaches for Capacity Object definition**

Departure at origin		Actual departure: 10:10
Departure at origin with a Bandwidth		Earliest departure: 10:07 Latest departure: 10:11
Arrival at destination		Actual arrival: 10:17
Arrival at destination with a Bandwidth		Earliest arrival: 10:05 Latest arrival: 10:10

<p>Arrival and departure at an intermediate location</p>		<p>Actual arrival: 10:09 Actual departure: 10:10</p>
<p>Arrival and departure at an intermediate location with a Bandwidth</p>		<p>Earliest arrival: 10:08 Latest arrival: 10:13  Earliest departure: 10:08 Latest departure: 10:13</p>
<p>Earliest &amp; latest departure is the same at an intermediate location when a path is connected to a Bandwidth</p>		<p>Earliest arrival: 10:00 Latest arrival: 10:15  Earliest departure: 10:15 Latest departure: 10:15  Actual departure: 10:15</p>
<p>Run through at an intermediate location</p>		<p>Actual run through: 10:09</p>

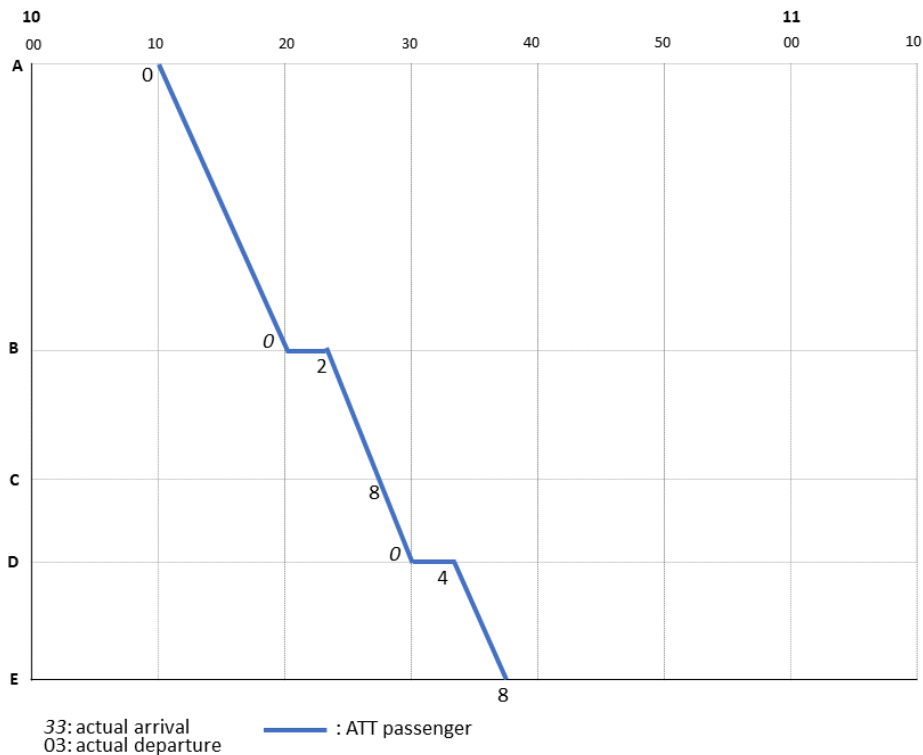
Each Capacity Object should contain and display their train parameters which serve as the basis for the path request requirement (e.g. planned speed, maximum weight, maximum length), see details in chapter 2.2 Content of the published Capacity Supply.

**Catalogue Path:**

Catalogue Path is a Preplanned Capacity that is defined by specific locations and time which indicate a particular allocation possibility. Catalogue Path gives the possibility for the IMs to construct a robust timetable where flexibility is limited due to infrastructure constraints. A Catalogue Path can only be specified by minute-sharp arrival and departure time (Table 5) and is visualised as shown in Figure 1.

**Table 5: Catalogue Path attributes<sup>9</sup>**

Location	Earliest arrival	Latest arrival	Actual arrival	Actual departure	Earliest departure	Latest departure
A			10:10	10:10		
B			10:20	10:22		
C			10:28	10:28		
D			10:30	10:34		
E			10:38	10:38		



**Figure 1: Visualisation of a Catalogue Path**

**Bandwidth**

Bandwidth represents Preplanned Capacity designated by specific locations but within a time range, without specifying exact minutes. Bandwidths give the flexibility for the IMs to „customize“ them taking into account their constraints and allow the Applicants to have a flexible choice to request a path within the indicated time range.

An IM can decide on the position and width of a Bandwidth. The use of Bandwidths should not lead to capacity waste and the feasibility of allocation should always be kept in mind when preplanning,

<sup>9</sup> The definition of the attributes is aligned with the TAF/TAP TSI standards, and this standardisation extends to additional attributes below.

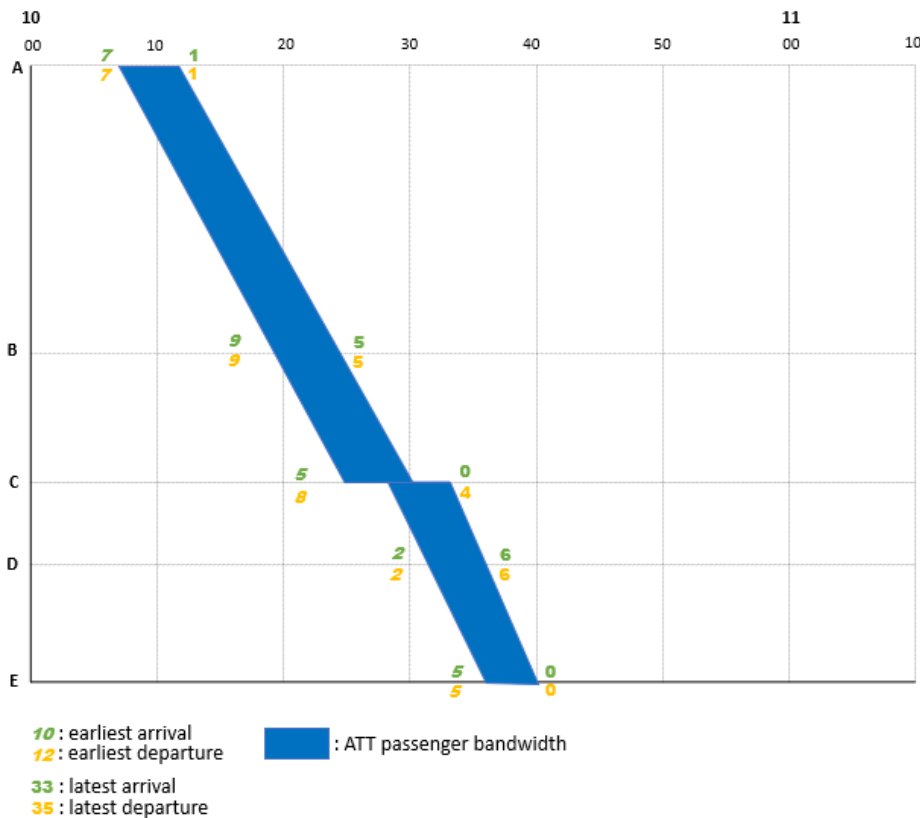
therefore the optimal combination of Bandwidths and Catalogue Paths should be applied. The use of bandwidth also allows to make the same Preplanned Capacity usable for different market needs in the later ordering period, and thus avoid discrimination. An appropriate Bandwidth can indicate the flexibility to facilitate the Applicant to assess the possible allocation options for path request.

Allocated capacity from Bandwidths is converted into Paths with the exact values by the final allocation at X-5.25.

A Bandwidth can be specified by indicating earliest arrival, earliest departure, latest arrival and latest departure time, showing the range in which the Path is possible to be allocated (Table 6). Visualisation shown in Figure 2.

**Table 6: Bandwidth attributes**

Locations	Earliest arrival	Latest arrival	Actual arrival	Actual departure	Earliest departure	Latest departure
A	10:07	10:11			10:07	10:11
B	10:19	10:25			10:19	10:25
C	10:25	10:30			10:28	10:34
D	10:32	10:36			10:32	10:36
E	10:35	10:40			10:35	10:40

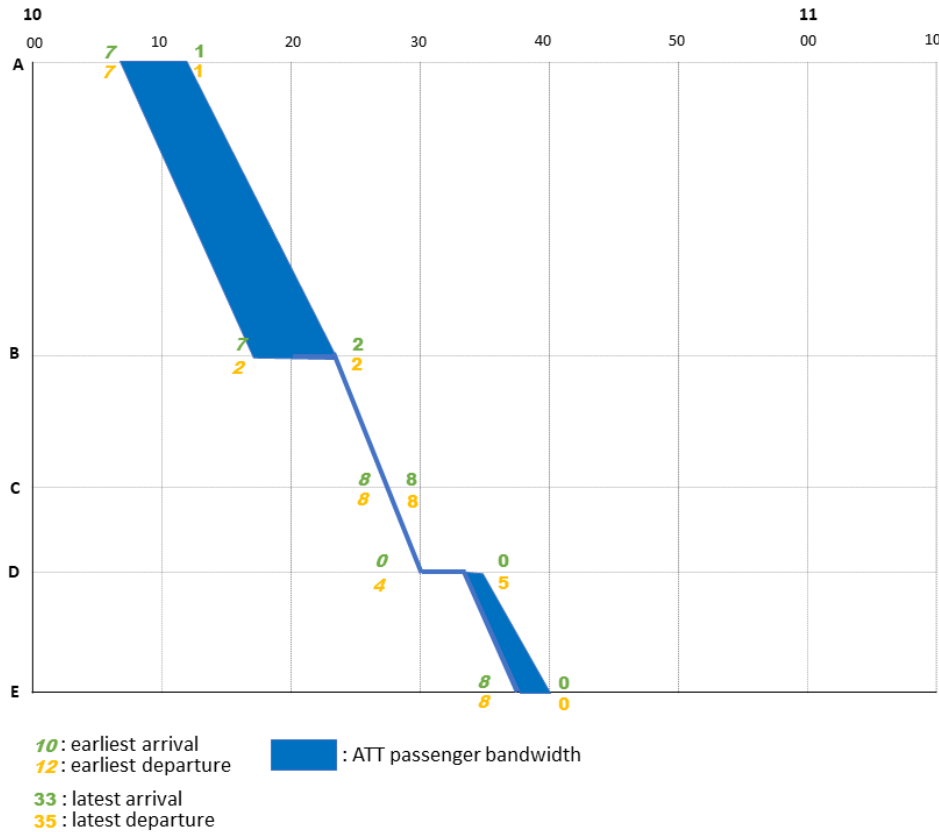


**Figure 2: Bandwidth visualisation**

It is also possible to construct a combination of a Bandwidth and a Catalogue Path by specifying time ranges at specific locations only. In the example (Table 7), a Bandwidth is formed by specifying ranges only between locations A and B, and D and E. This allows flexible path allocation in those sections, while there is only one option between locations B and D. Visualisation shown in Figure 3.

**Table 7: Combination of a Bandwidth and a Catalogue Path**

Locations	Earliest arrival	Latest arrival	Actual arrival	Actual departure	Earliest departure	Latest departure
A	10:07	10:11			10:07	10:11
B	10:17	10:22			10:22	10:22
C	10:28	10:28	10:28	10:28	10:28	10:28
D	10:30	10:30			10:34	10:35
E	10:38	10:40			10:38	10:40



**Figure 3: Visualisation of the combination of a Bandwidth and a Catalogue Path**

**Use case:**

During the preparation of the Capacity Supply, the IM decides to offer broader capacity alongside the Catalogue Path 'F33886' to increase flexibility using the available vacant capacity around that (marked with the yellow territory). To indicate the suggested allocation possibilities, they use Bandwidth. They take into account the limitations of their infrastructure and do not waste capacity when designing the appropriate Bandwidth (Figure 4).

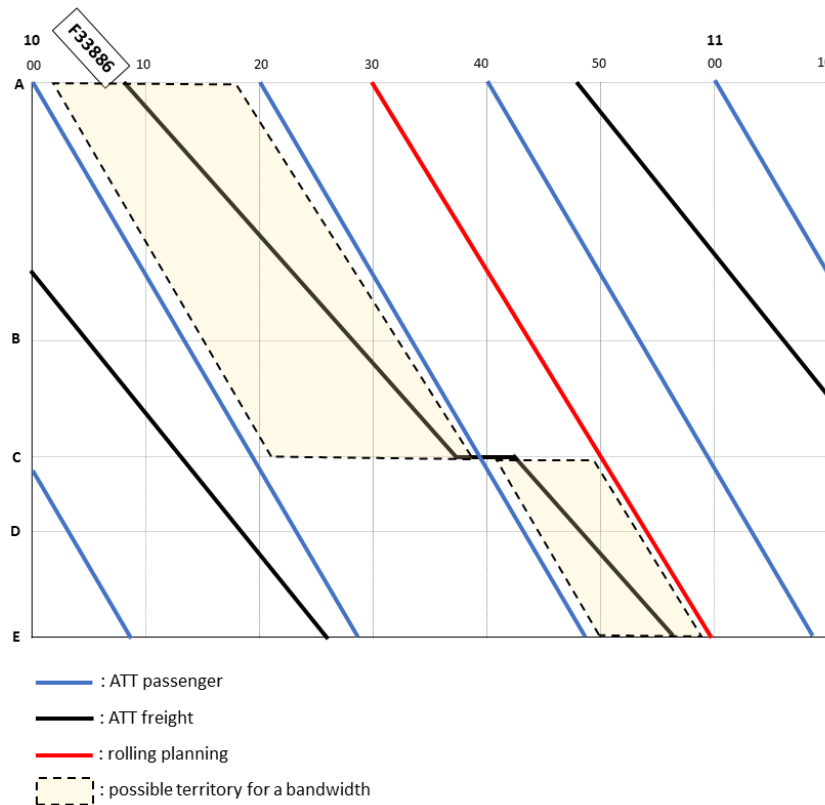


Figure 4: Designing Bandwidth

The IM indicates the Bandwidth with the final time parameters (Figure 5). Applicants can see the timeslot within which a path can be placed. This timeslot can help the Applicant to determine the desired path (including additional stop, adjusting speed, dwell time etc.).

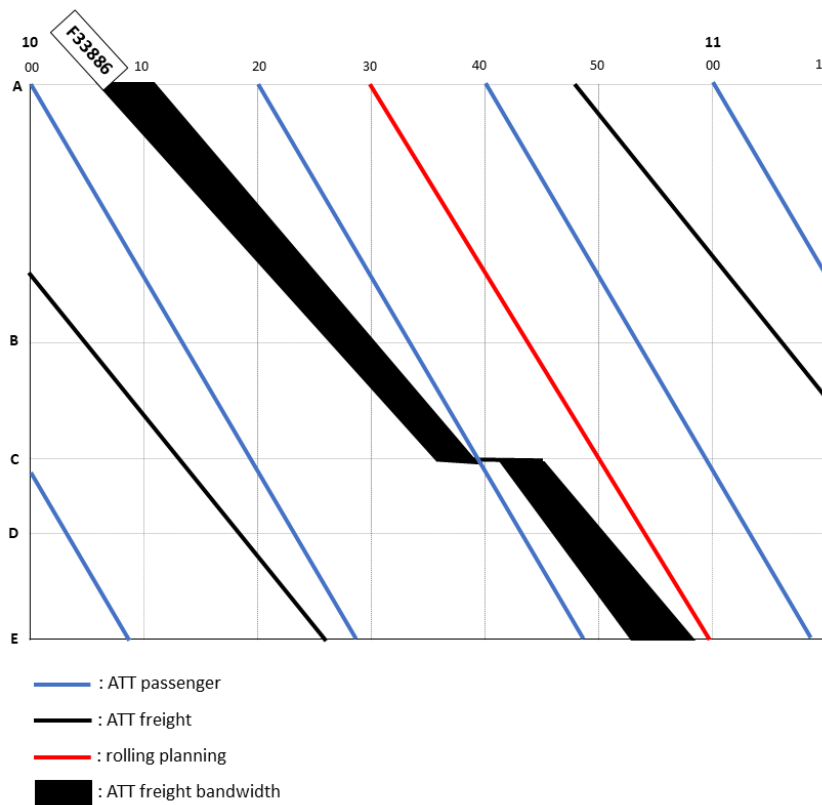


Figure 5: Bandwidth with the final time parameters

## 2 Phase I: Capacity Supply Preplanning Process

X-18 → X-11

This process defines the tasks of the IMs, who are involved in the capacity supply pre-planning phase, the timeline to be followed by the involved stakeholders and process steps that should be executed during the particular sub-phases of the Capacity Supply pre-planning phase.

It is recommended to preplan capacity in detail, on lines where numerous conflicts are expected, while applying greater flexibility on lines where only one traffic characteristic is expected, and where sufficient spare capacity is available. The geographical scope of the preplanning process can be found in chapter 1.5 Geographical scope.

### 2.1 Connection between Capacity Model and Capacity Supply

The Capacity Model is one of the basis of the Capacity Supply. It contains volumes per traffic type on an hourly basis and is harmonised internationally among IMs. The Capacity Supply should be able to accommodate the number of volumes per hour in the Capacity Model, on the dedicated non-TCR calendar day. More than this can be indicated in the Capacity Supply while respecting as much as possible the minimum number of volumes of the Capacity Model.

E.g. 5 ATT passenger and 3 Rolling Planning volumes are indicated in the Capacity Model to a certain hour. In the same hour, more ATT passengers can be added to the Capacity Supply if the 3 Rolling Planning is retained.

In case of negative deviations from the Capacity Model i.e. the above-mentioned minimum requirement in the Capacity Supply is not reached, a general assessment (not on each individual volume) should be published by IMs, where deviations are basically reported and explained.

### 2.2 Content of the published Capacity Supply

The published Capacity Supply first partitions the capacity by traffic type (at least to freight, passenger, other and unplanned capacities). In the second step capacity is divided into the processes through which such capacity can be requested (ATT, Rolling Planning, Ad hoc). For this partitioning layers are needed, which are defined in Tables 5 and 6. The mandatory use of these layers depends on the specific Capacity Product to be determined. The Capacity Product has the highest position in the hierarchy, prompting IMs to initiate the definition process with this layer before proceeding with the mandatory and optional layers (see Table 8). The application of the products depends on the saturation of the line for which they are intended (see Table 10).

#### 2.2.1 ATT and Safeguarded capacity

ATT capacity is dedicated for Applicants who can predict their needs in detail. This may be requested during ATT phase only. ATT capacity has to contain at least the traffic type parameter (passenger, freight or other). Safeguarded capacity is prepared for those Applicants who cannot predict their needs in advance and might need capacity ad hoc or intended to use capacity multi-annual. The capacity reserved for future use is intended to create flexibility in the system. Similarly to other Capacity Products, Capacity Supply has to contain at least the amount of safeguarded Capacity Products such as ad hoc and rolling planning, that have been indicated in the Capacity Model without TCRs in the respected hour. The primary distinction is that safeguarded Capacity Products are not available for request during the ATT phase. Therefore, the final offered position of these capacities may differ from the first publication of the Capacity Supply (at X-11) due to various reasons (e.g. path optimization or alteration caused by other paths or late TCRs) but should remain:

- with similar quality,
- with the same quantity,
  - within the same timeframe planned in the Capacity Model.

Safeguarded capacities have different parameters compared to ATT capacities, aiming to enhance flexibility. Unlike ATT capacities, in this context, there is no requirement to specify the type of traffic (passenger/freight/other) to remain unbound to a particular traffic type, thereby enhancing flexibility for future use.



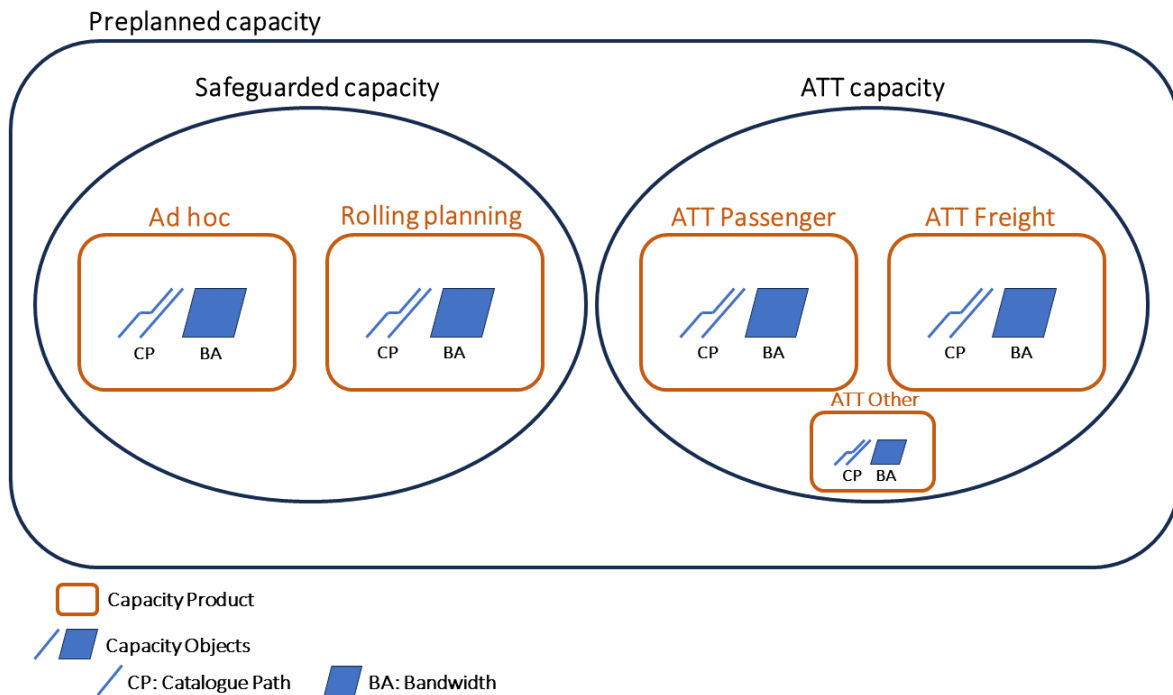


Figure 6: Explanation of the relationship between capacity elements

To define an ATT product, these layers have to be used, where #1 and #2 are mandatory, while #3 and #4 are optional.

Table 8: ATT product definition

#1: Traffic Type Layer	#2: Network Layer	#3: Train Category Layer	#4: Train Parameters Layer
<b>Mandatory</b>	<b>Mandatory</b>	<b>Optional</b>	<b>Optional</b>
<ul style="list-style-type: none"> <li>• Passenger</li> <li>• Freight</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• International</li> <li>• National</li> <li>• International or national<sup>10</sup></li> </ul>	<p>Categories for passenger trains:</p> <ul style="list-style-type: none"> <li>• high-speed trains</li> <li>• long-distance trains</li> <li>• express regional trains</li> <li>• regional trains</li> </ul> <p>Categories for freight trains:</p> <ul style="list-style-type: none"> <li>• wagonload</li> <li>• block</li> <li>• combined transport train.</li> </ul>	<p>Parameters for ATT passenger trains:</p> <ul style="list-style-type: none"> <li>• reference loco type or parameters</li> <li>• planned speed</li> <li>• maximum train length</li> <li>• stopping pattern (indicated in the timetable graph or the possible number of stops)</li> </ul> <p>Parameters for ATT freight trains:</p> <ul style="list-style-type: none"> <li>• reference loco type or parameters</li> <li>• maximum standard train weight,</li> <li>• maximum standard train length,</li> <li>• minimum and/or maximum speed,</li> <li>• dangerous goods or extraordinary consignments (not allowed),</li> <li>• braking parameters,</li> <li>• max-profile.</li> </ul>

<sup>10</sup> Capacity object can serve both national and international needs.

To define a Safeguarded product, these layers have to be used, where #1 is mandatory, while #3, #4 and #5 are optional.

**Table 9: Safeguarded capacity definition**

#1: Capacity Product Layer	#2: Network Layer	#3: Traffic Type Layer	#4: Train Category Layer	#5: Train Parameters Layer
<b>Mandatory</b>	<b>Mandatory</b>	<b>Optional</b>	<b>Optional</b>	<b>Optional</b>
<ul style="list-style-type: none"> <li>• Ad hoc</li> <li>• Rolling Planning</li> </ul>	<ul style="list-style-type: none"> <li>• International</li> <li>• National</li> <li>• International or national<sup>11</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Passenger</li> <li>• Freight</li> <li>• Other</li> </ul>	<p>Categories for passenger trains:</p> <ul style="list-style-type: none"> <li>• high-speed trains</li> <li>• long-distance trains</li> <li>• express regional trains</li> <li>• regional trains</li> </ul> <p>Categories for freight trains:</p> <ul style="list-style-type: none"> <li>• wagonload</li> <li>• block</li> <li>• combined transport train.</li> </ul>	<ul style="list-style-type: none"> <li>• reference loco type or parameters</li> <li>• maximum standard train weight,</li> <li>• maximum standard train length,</li> <li>• minimum and/or maximum speed,</li> <li>• dangerous goods or extraordinary consignments (not allowed),</li> <li>• profile.</li> </ul>

*Please note that conflict resolution during the path request and path allocation phases is outside the scope of the Capacity Supply Handbook and is managed by other applicable procedures, such as the Allocation Principles and the Path Allocation Handbook.*

<sup>11</sup> Capacity object can serve both national and international needs.

### 2.2.2 Handling scarce capacity

During the preparation of the Capacity Supply, it has to be checked which sections of infrastructure have been declared congested (as defined by Article 47 of Directive 2012/34/EU). Based on the already prepared capacity enhancement plan (as defined by Article 51 of Directive 2012/34/EU; where available) the IM can identify those sections, where the congestion cannot be released for the timetable period covered by the Capacity Supply.

Scarce capacity can be managed through the optimal use of different Capacity Objects on congested or highly utilised infrastructure vs on non-congested infrastructure.

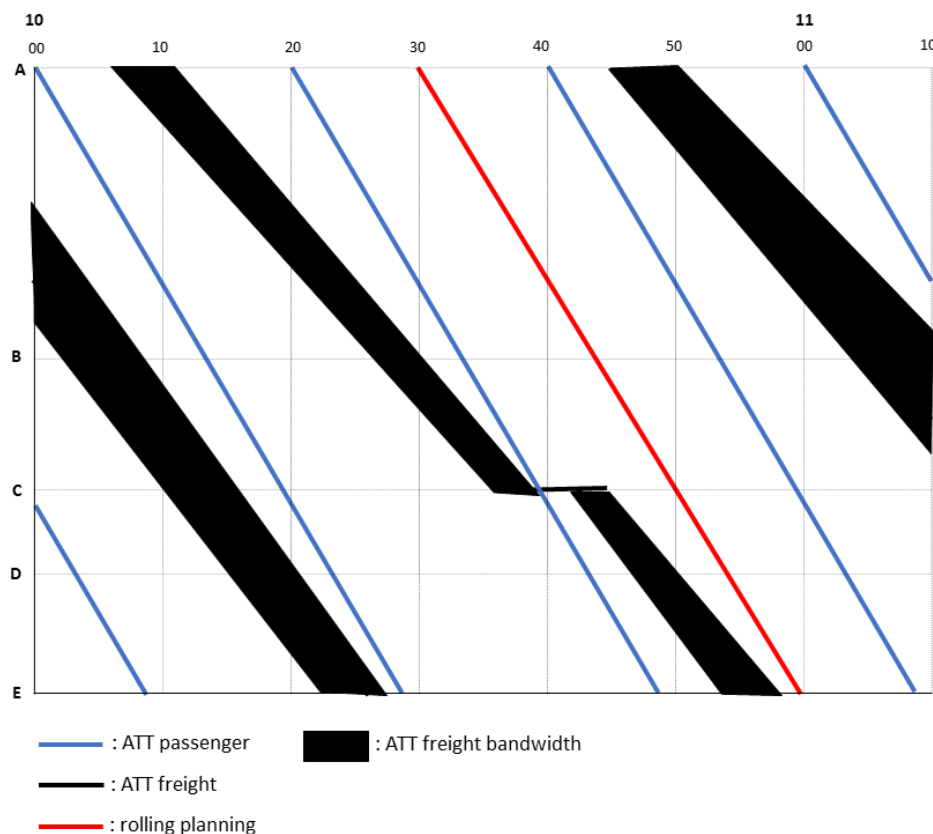
#### **Non-congested infrastructure:**

In the case when a line is considered as non-congested, the Capacity Supply should be prepared and published:

- in the form of Bandwidths for ATT passenger, ATT freight and Rolling planning, or if this is not possible, in the form of Catalogue Paths.
- No Preplanned Capacity need to be published for Ad hoc, as it will be handled using tailor-made path utilising empty spaces.

The example in Figure 7 shows Catalogue Paths and Bandwidths on a non-congested infrastructure.

However, it should also be noted that if the path request significantly differs from the published Capacity Supply, the IMs may not be able to accommodate it according to the initial request. It should be highlighted that the safeguarded products (ad hoc, rolling planning) cannot be requested during the annual path request phase.



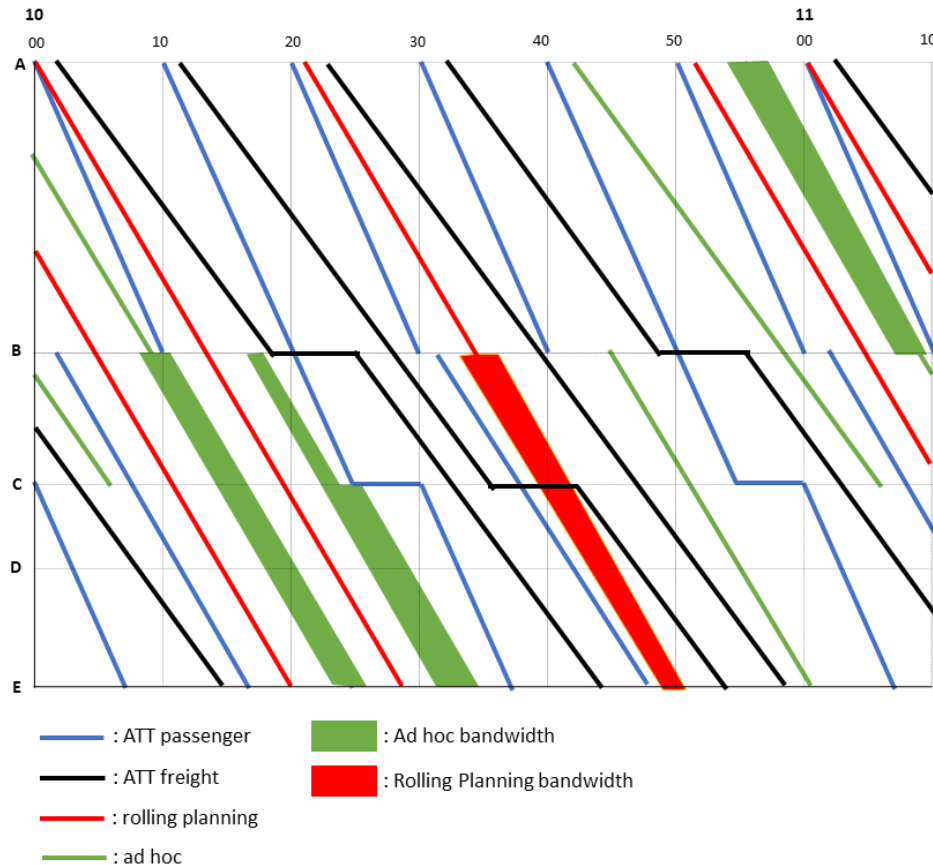
**Figure 7: Example of a non-congested infrastructure**

**Congested or highly utilised infrastructure:**

In the case when a line is considered congested or foreseen to be highly utilised, the Capacity Supply should be prepared and published:

- in the form of Catalogue Paths for ATT passenger, ATT freight
- in the form of Catalogue Paths or Bandwidth for Ad hoc and Rolling Planning.

The example in Figure 8 shows Catalogue Paths and Bandwidths on a congested infrastructure. On empty space, in the path request process, tailor-made paths can be requested by Applicants.



**Figure 88: Example of a congested infrastructure**

Table 10 summarises the required path definition for each product for congested or non-congested infrastructure.

**Table 10: Summary table for utilisation of Preplanned Capacity on scarce lines**

Catalogue Product	Congested or highly utilised infrastructure	Non-congested or not highly utilised infrastructure
ATT passenger	Catalogue Paths	Catalogue Paths; where necessary, Bandwidth <sup>12</sup>
ATT freight	Catalogues Paths	Catalogue Paths; where necessary, Bandwidth <sup>13</sup>
Ad hoc	Bandwidth or Catalogue Paths	No publication is needed, the empty space will be utilised for tailor made paths
Rolling Planning	Bandwidth or Catalogue Paths	Bandwidth <sup>11,12</sup>

<sup>12</sup> In the case when neither the structure nor the foreseen demand on the network requires preplanned capacities, empty spaces can be also applicable. On top of the existing timetable structure (e.g. clock-wise timetable), tailor-made requests can be placed even for ATT passenger.

<sup>13</sup> In the case when neither the structure nor the foreseen demand on the network requires preplanned capacities, empty spaces can be also applicable. On top of the existing timetable structure (e.g. clock-wise timetable), tailor-made requests can be placed even for ATT freight.

### 2.2.3 TCRs

The Capacity Supply should include at least those major, high impact TCRs and TCR windows which were published in the Capacity Model. Inclusion has two aspects: IMs should provide traffic solutions on TCR days, meaning the paths in the Capacity Supply have to be adjusted according to the TCR, and these TCRs should be displayed on the Capacity Supply diagram in the appropriate timeslot. Those TCRs which have been published but have no finalised traffic solutions will not be included in the Capacity Supply. In the future, it is expected that the Capacity Supply will be able to show potential overlaps. Depending on the functionality of ECMT, the Capacity Supply might not show all the conflicts between paths and TCRs (Figure 10) (e.g. in a partial closure case), except in the cases when the total closure is indicated on one or between several PLCs (Figure 9).



Figure 9 Total Closure between B and C

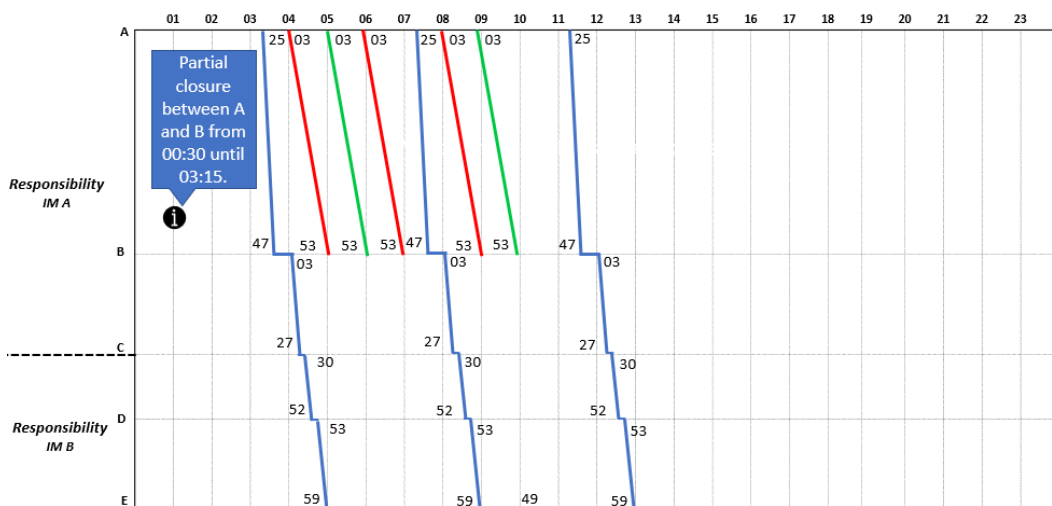


Figure 10 Partial closure between A and B from 00:30 until 03:30

Even though not all the TCRs are shown in the timetable graph as negative capacities, the IMs should publish the Catalogue Paths/Bandwidths in a way which takes the negative capacities (according to the timeline defined in chapter 1.4) into consideration. As shown in Figure 11, during a non-TCR day two trains meet on the open line section. However, as a partial closure was introduced between A and B from 3:30 until 13:30, the Catalogue Paths should be adjusted. Therefore, the Catalogue Paths in the published Capacity Supply during TCR period (Figure 12) should take into consideration the single track operation.

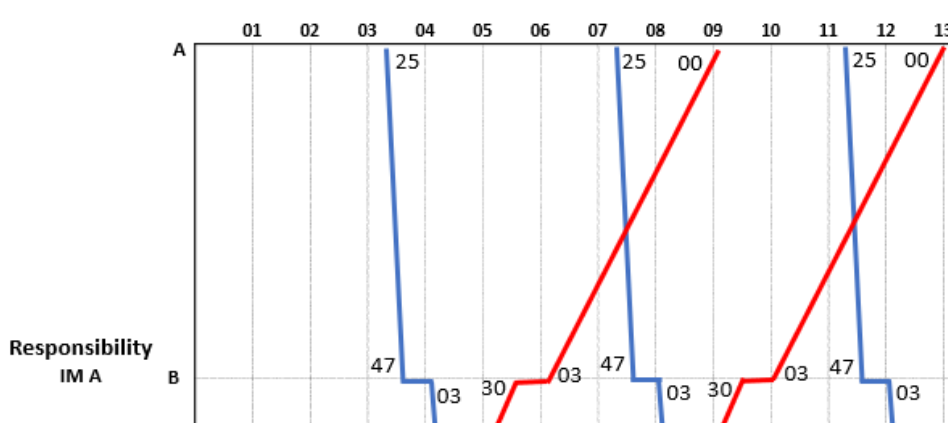


Figure 11 Non TCR day

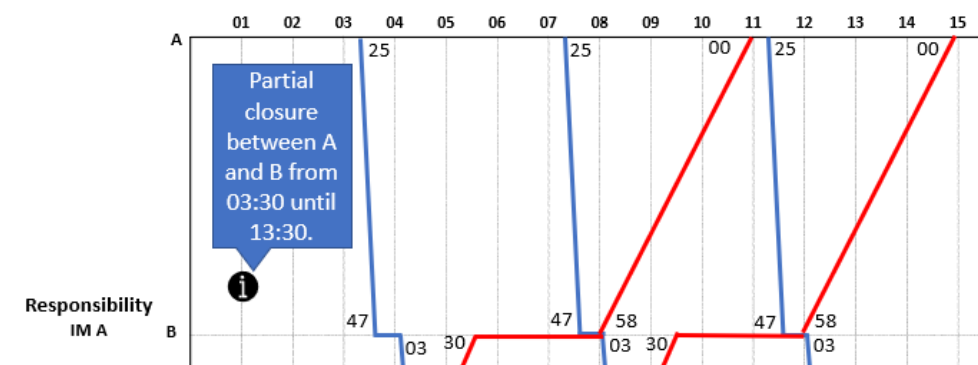


Figure 12 TCR period

### 2.3 Coordination of the Capacity Supply

Coordination is the process whereby IMs work together to achieve harmonised Capacity Supply at multi-network level. Harmonisation is an iterative cooperation among IMs and the result of that is a harmonised Capacity Supply. This must be done before X-11, prior to the publication of the Capacity Supply. The primary volume harmonisation should have been carried out within the Capacity Model procedure, thus, Capacity Supply has to use the outcomes.

Harmonisation should be done at least at the borders with the involvement of the two affected IMs and can be done on the origin-destination level with the involvement of all affected IMs. The procedure can therefore be carried out bilaterally or with the involvement of more than two IMs. Generally, IMs are responsible for organising these meetings. However, RNE can assist in organising such meetings when the involvement of more than two IMs is required, such as in the case of long-distance freight trains or night trains. Due to the large amount of data, central IT support is needed to properly visualise the situation at the borders and to indicate discrepancies with possible solutions.

The aim of the harmonisation is to match the Catalogue Paths and Bandwidths with each other on both sides of the borders. To achieve this, time parameters have to be matched for every single Catalogue Path and Bandwidth. Harmonisation of time parameters is a must although no need to harmonise each train parameter as long as the minimum requirement is respected. IMs have the option to decide to harmonise additional parameters beyond the minimum requirements. For details, see Guidelines for harmonisation.

**Guidelines for harmonisation:**

At the border:

**Table 11: Guidelines for Capacity Supply harmonisation at the border**

<p><b><u>Capacity Object</u></b></p> <p>Harmonisation is based on matching pairs on both sides of the border on the basis of:</p> <ul style="list-style-type: none"> <li>• Traffic type: Passenger/freight/other</li> <li>• Network: International</li> </ul>	
Mandatory	Optional
<p><b><u>Time parameters</u></b></p> <p>The aim is to synchronise the pairs at the border in terms of timing. Negative deviation should be avoided in any case (e.g. arrival at 10:40, departure at 10:35).</p> <p><b><u>Catalogue Paths</u></b></p> <ul style="list-style-type: none"> <li>• Train with no stop at the border             <ul style="list-style-type: none"> <li>○ These trains must run on both sides of the border at the same time (i.e. same planned time on a minute basis).</li> </ul> </li> <li>• Train with a stop at the border             <ul style="list-style-type: none"> <li>○ These trains must be linked to each other with a planned dwell time (e.g. arrival 10:35; dwell 10:35 – 10:40; departure 10:40).</li> </ul> </li> </ul> <p><b><u>Bandwidth</u></b></p> <ul style="list-style-type: none"> <li>• Bandwidths on both sides of the border must align for a range of at least one minute. However, in an ideal scenario, the broader the match, the greater the flexibility they provide.</li> </ul> <p><b><u>Bandwidth and Catalogue Paths</u></b></p> <ul style="list-style-type: none"> <li>• The harmonisation of a combination of a Bandwidth and a Catalogue Path is also possible. To achieve this, the Catalogue Path and the Bandwidth must align for a range of at least one minute; i.e. the Catalogue Path’s arrival or departure time must be within the departure or arrival time range of the Bandwidth.</li> </ul>	<p><b><u>Train parameters</u></b></p> <p>The aim is to align the pairs at the border in accordance with the minimum required level of train parameters, which includes the following:</p> <p><b><u>ATT passenger</u></b></p> <ul style="list-style-type: none"> <li>• maximum train length</li> </ul> <p><b><u>ATT freight and ad hoc</u></b></p> <ul style="list-style-type: none"> <li>• maximum standard train weight,</li> <li>• maximum standard train length,</li> <li>• maximum speed,</li> <li>• dangerous goods or extraordinary consignments (not allowed),</li> <li>• max-profile (optional for ad hoc)</li> </ul> <p>Note: In addition to the minimum required parameters, variations in other parameters can exist on either side of the border, as different RUs may operate the same train differently (e.g. train type: long-distance train / local train; IM planned speed).</p>

A Capacity Supply is considered harmonised if all of its associated borders have achieved harmonisation. A border is considered harmonised when all time parameters and train parameters at the minimum level are arranged. To be able to implement and verifying this, IT support is needed.

On the origin-destination level:

RNE may provide assistance in coordinating meetings when trains that need harmonisation cross multiple IMs' territories, necessitating the involvement of more than two IMs. This is particularly relevant in scenarios of long-distance freight trains or passenger night trains.

## 2.4 Consultation of the Capacity Supply

Consultation is an iterative procedure between IMs and Applicants where IMs can introduce the possible pre-arranged scenarios in the Capacity Supply, while Applicants have the opportunity to comment on them.

The Capacity Model is one of the core basis of the Capacity Supply in the TTR environment. Thus, the consultation on the capacity-wise content of the Capacity Model works as a pre-consultation of the Capacity Supply. Applicants may submit additional needs after the Capacity Model has been finalised by submitting a Feasibility Study request from X-18. IMs should process these submissions as it is defined in the Feasibility Study handbook.

### Consultation during the creation of Capacity Supply

At the latest X-13.5 IMs have to provide information to the Applicants on sections with potential high utilisation of capacity. The same level of detail as in the final Capacity Supply are expected for the sections which are presented at this time. Applicants may comment on this information until X-12.5.

### Result of the consultation

IMs should consider all inputs and take them into account as much as possible when designing Capacity Supply which shall be published at X-11 together with the IM general considerations concerning decisions taken.

*Please note that conflict resolution during the path request and path allocation phases is outside the scope of the Capacity Supply Handbook and is managed by other applicable procedures, such as the Allocation Principles and the Path Allocation Handbook.*



### 3 Phase II: Capacity Supply Intermediate Process

X-11 → X-5.25

During this intermediate phase, no updates to the Capacity Supply are scheduled, as IMs are occupied with the development of the draft timetable. There is a possibility for Applicant to send remarks on the published Capacity Supply before X-9.

The representation of the Draft Timetable should appear without confidential data in a Capacity Supply format (time-space diagram) using the available data as a basis.

*Please note that conflict resolution during the path request and path allocation phases is outside the scope of the Capacity Supply Handbook and is managed by other applicable procedures, such as the Allocation Principles and the Path Allocation Handbook.*

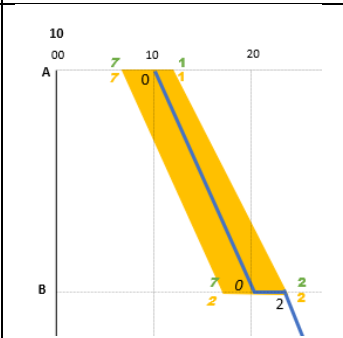
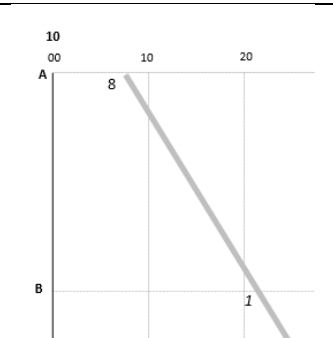
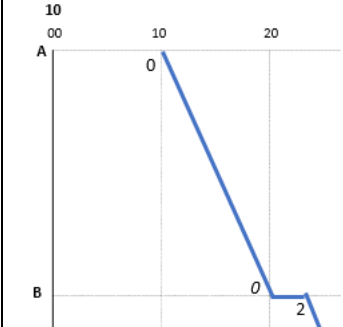
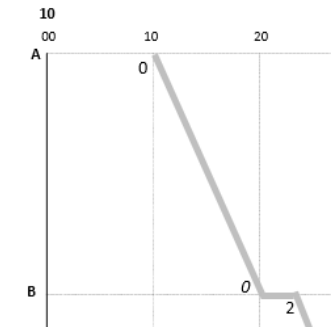
### 4 Phase III: Capacity Supply Updating Process

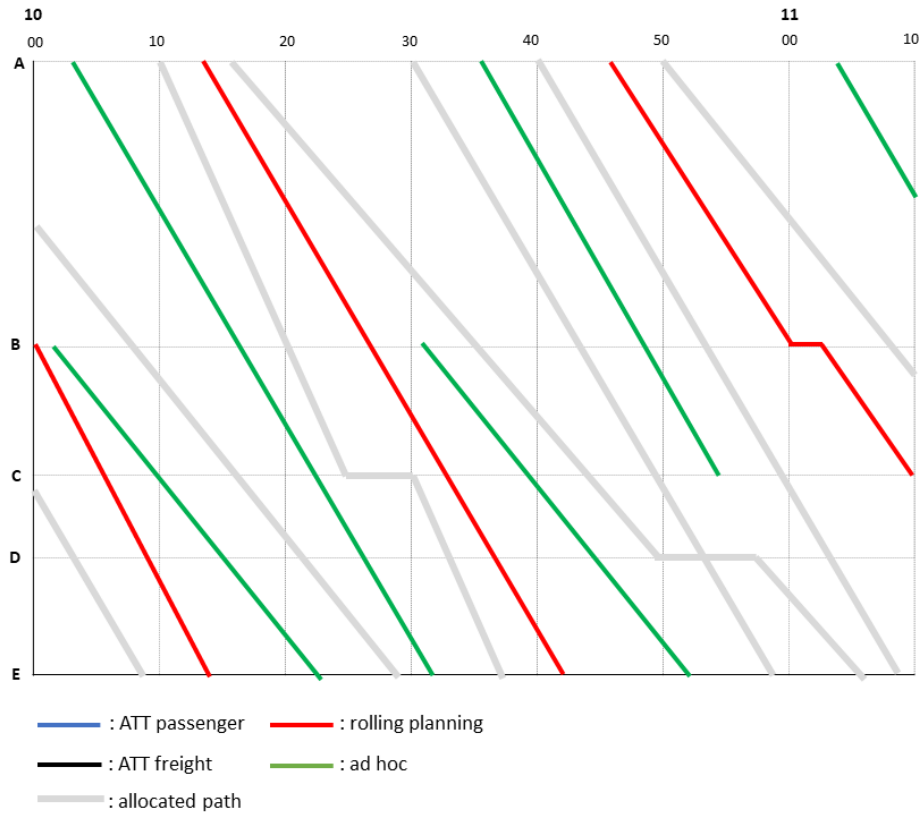
X-5.25 → X+12

After the publication of the Capacity Supply (X-11), the first update occurs following the final allocation during the ATT process. By that time all allocated paths should be indicated on the Capacity Supply time-space diagram to display the remaining capacity. The IM may publish the beneficiary of the allocated capacity. Safeguarded capacity still has to be retained. Capacity Supply should contain at least the amount of safeguarded Capacity Products that have been indicated in the Capacity Model for the respected hour.

Allocated capacity from Bandwidths is converted into Paths. All non-allocated ATT Capacity Products are released and can be requested during the late path request, rolling planning or ad hoc phases. The released capacity might be allocated to a different traffic type depending on the capacity parameters.

**Table 12: Relation between published and allocated capacity**

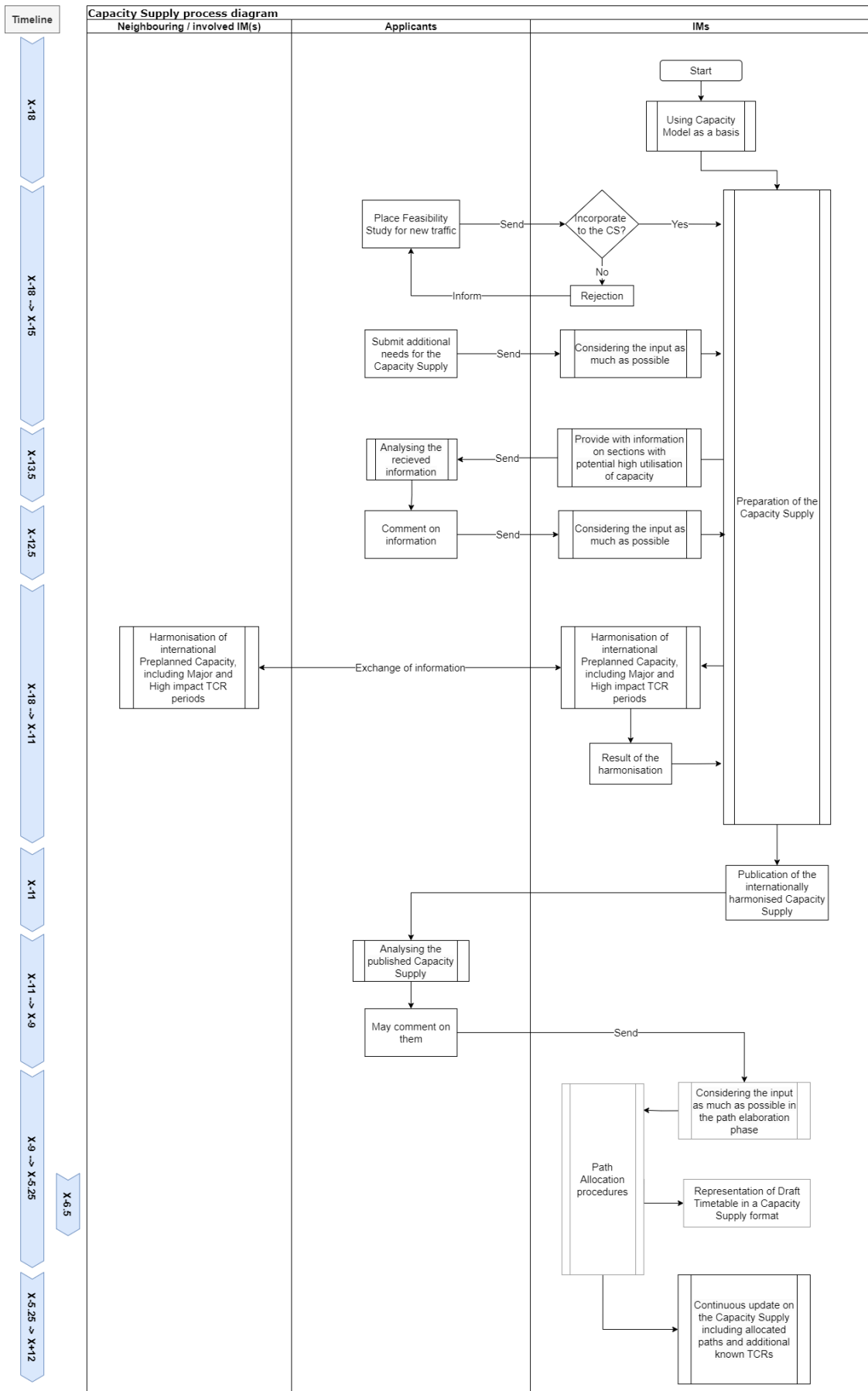
	At the publication of the Capacity Supply (X-11)	In case of allocation
ATT path (with Bandwidth)		
ATT path		



**Figure 13: Capacity Supply after final allocation including allocated Late Path Requests**

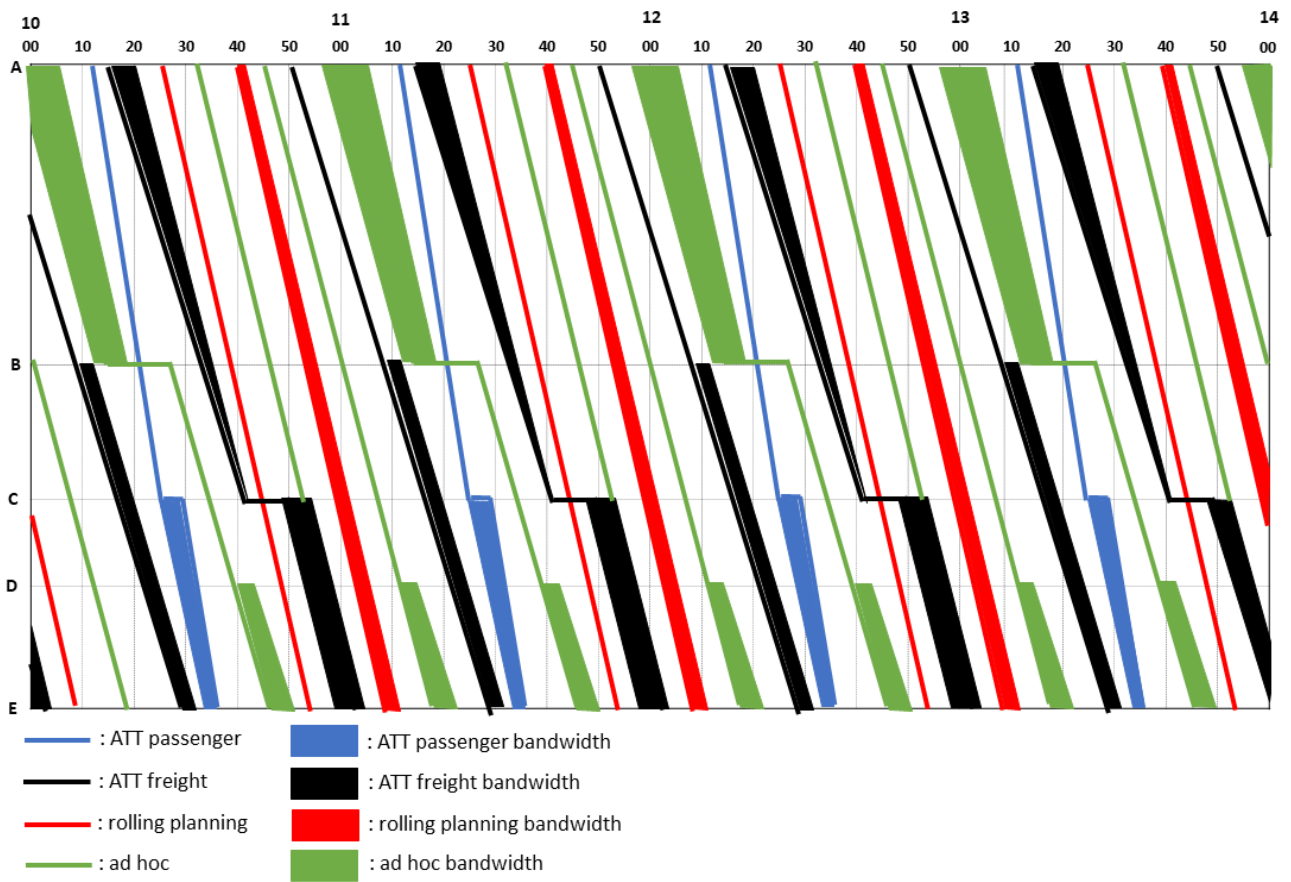
*Please note that conflict resolution during the path request and path allocation phases is outside the scope of the Capacity Supply Handbook and is managed by other applicable procedures, such as the Allocation Principles and the Path Allocation Handbook.*

## Annex A: Process diagram for Capacity Supply procedure



## Annex B: Capacity Supply time-space diagram overview

This figure shows an example of Capacity Supply time-space diagram after publication.



*Note: paths are indicated in one direction only and the final visualisation can be different. The aim of this diagram is to show the different Capacity Products on one picture.*

## **Annex C: Conflict resolution and rules (bindingness of the Capacity Supply)**

To be updated.