CAPACITY MODEL

The task of the Capacity Model is to map the national and international track capacities available in the timetable year on the basis of international coordination of major and high-impact Temporary Capacity Restrictions (TCRs) and cross-border traffic, as well as their planned allocation. The Capacity Model will be published around 9 months before the main order date for X-18.

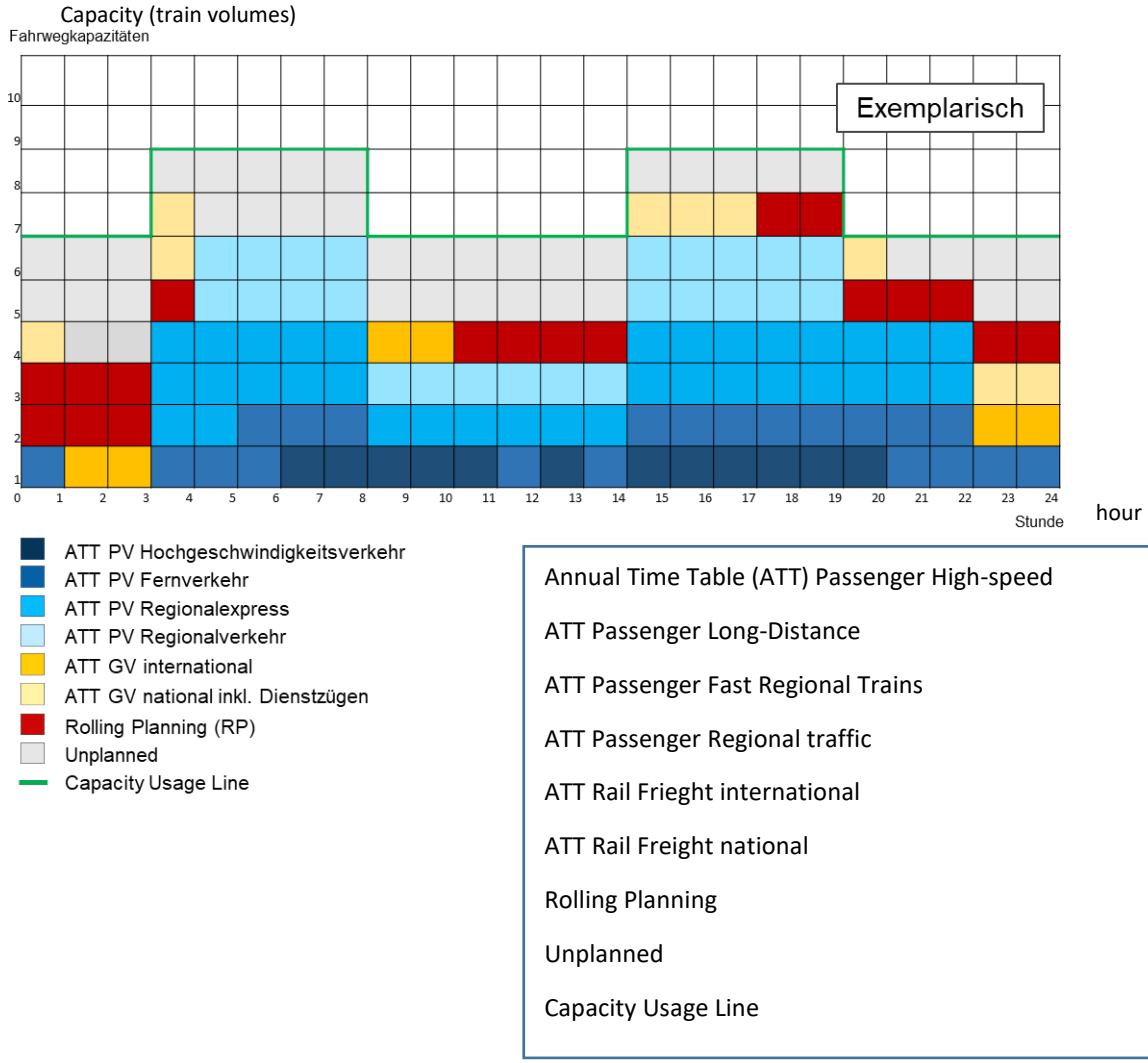
Content and data basis

The Capacity Model shows the number of track capacities per route in the relevant section in 24 hours of a heavily loaded working day after dedications:

Baseline: Track capacity on routes considering year-round TCRs with description of maintenance windows

TCR variants: route capacities on routes with major+high impact TCRs that are not year-round and detour routes

Capacity Model



Annual Time Table (ATT) Passenger High-speed

ATT Passenger Long-Distance

ATT Passenger Fast Regional Trains

ATT Passenger Regional traffic

ATT Rail Frieght international

ATT Rail Freight national

Rolling Planning

Unplanned

Capacity Usage Line

In order to map the infrastructure in the Capacity Model, the existing infrastructure parameters according to the current timetable is extended with the following data:

• Known changes to the infrastructure with affecting traffic in the year of the Capacity Model

• Known infrastructure restrictions affecting traffiin the year of the Capacity Model

- **Major impact TCRs**
  - Duration of restriction > 30 days; Restrictions for > 50% of capacity per day

- **High impact TCRs**
  - Duration of restriction > 30 days; Restrictions for 30 – 50% of capacity per day
  - Duration of restriction 7-30 days; Restrictions for > 30% of capacity per day

The traffic volumes in the Capacity Model are based on the following data and assumptions:

• Current network timetable with adjustments due to new infrastructure and modifications as a result of major impact TCRs

• Known planned expansions in passenger transport services

• Assumption of an increase of 2% p.a. for freight traffic to complete route capacities rounded up from the current working timetable year

• Data on the capacity requirements of those entitled to capacity according to the received route capacity requirement notifications (CNAs)

Partitioning and dedication of capacity according to traffic types

The central aim of the TTR concept is to secure capacity in a quantity and quality that meets the needs for types of traffic, especially freight traffic. The instrument for this is the capacity allocation, i.e. the division of the available capacity into quotas and their allocation for individual traffic types and products (release of the capacity quotas at different order times). By allocating capacity according to traffic type, it is intended to ensure that sufficient capacity is primarily available for freight traffic at times of day that meet customer needs. Through allocation by product, attractive capacity is also to be secured for orders after the main ordering date or ongoing orders, primarily in freight traffic. The designation used at ÖBB-Infrastruktur AG based on the RNE recommendations includes the following types of traffic:

- Annual Time Table (ATT) Passenger High-speed
- ATT Passenger Long-Distance
- ATT Passenger Fast Regional Trains
- ATT Passenger Regional traffic
- ATT Rail Frieght international
- ATT Rail Freight national
- Rolling Planning
- Unplanned

Additionally following capacity products are considered:

- Annual Timetable (ATT) – capacity released at the main ordering date
- Rolling Planning (RP) including ad-hoc – capacity released continuously starting X-4

The allocation of traffic types is based on the traffic types in the current network timetable and the Capacity Needs Announcements (CNAs) received during the creation of the Capacity Model.

The distribution of traffic types by product is derived from an analysis of orders, changes and cancellations in 2021 carried out by the Business Unit Network Access and a customer survey carried out by by the Business Unit Network Access in summer 2022. Accordingly, in the 2025 capacity model, passenger transport is fully assigned to the ATT product, since it can be assumed that most of the orders will be placed on the main order date. For freight transport, an order of around 50% of the total volume requested is deposited on the main order date, so that 50% of the contingent is dedicated to the ATT product. A later order is accepted for the other 50%, so that they are considered in the Rolling Planning product. Additional capacity for ad hoc traffic is also included in the Rolling Planning product contingent.

Capacity dedicated neither to traffic types nor to products is marked as “unplanned”; it can be used for all dedications.

Capacity Usage Line

According to the method according to UIC leaflet 406 (“Leaflet method” or “compression method”), the probable degree of utilization per route is determined by compressing all occupancy times of the stored route capacities over 24 hours for 2025. A quality factor (25% - 75% of the occupancy time) is added depending on the traffic mix.

Capacity Usage Line

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When using the UIC method, the maximum possible capacity on a route in 24 hours (number of route capacities at 100% capacity utilization minus 1 route capacity) can be calculated. It consists of the stored expected traffic mix and any. additional hypothetical route capacities for "filling up" to the maximum possible capacity and the quality factor.

If the maximum capacity calculated for 24 hours were evenly distributed over the course of the day, 1/24 of this capacity would be available for each hour. Over 24 hours, the limit line for the maximum available capacity (Capacity Usage Line) would be a straight line.

In the capacity model, this maximum possible capacity in 24 hours is distributed over the course of the day according to the traffic mix. Accordingly, travel route capacities greater than/less than or equal to 1/24 of the maximum possible 24-hour capacity are provided for in individual hours. The corresponding capacity usage line again follows the course of the route capacities allocated per hour and thus varies over the course of the day.

Participation and consultation of applicants

At X-26, applicants are invited by ÖBB-Infrastruktur AG to submit a capacity needs announcement (CNA) by X-24. CNAs are preferably introduced using the appropriate format in the European Capacity Management Tool (ECMT).

By X-22, the process provides for a capacity check and individual responses to the CNAs and, if necessary, a consultation with applicants whose CNAs can be considered only partially or not at all.

CNAs have the following roles in capacity model building:

• Early notification of changes to the current timetable

• Input for assessment of total capacity needs on a route and planning of contingents according to dedications

However, there is no direct systemic relationship between the capacity planned in the Capacity Model and available capacity and the specific CNAs of applicants, i.e. the planned capacity cannot be assigned to applicants. The acknowledgment of a CNA, i.e. a CNA that can be covered by available capacity, therefore also does not imply a promise by the IM that capacity is reserved or available when ordered with the specific parameters stated in the CNA.

ÖBB-Infrastruktur AG also plans to consult applicants on the preliminary draft of parts of the capacity model or even the entire capacity model.

International Coordination

The coordination of route capacities (number per hour in 24 hours) in international traffic with allocation according to traffic types and products with neighboring infrastructure operators must take place from around X-21. An internationally uniform process and rules for harmonization are to be defined.

IT tools

Europe-wide (central) IT systems are being developed to implement the TTR concept:

• The ECMT (European Capacity Management Tool) will fulfill the following functions

o Publication of the capacity model including the processing of CNAs

o Publication of the capacity offer

o International coordination of capacity model and available capacity including TCRs and time limits

• Orders are processed via PCS (Capacity Broker).

o Ordering of national and international train paths for the annual timetable including harmonization of limit times