TTR ECMT

European Capacity Management Tool

Training Manual

Version 1.0

RNE

RailNetEurope

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1 What is ECMT

ECMT stands for the European Capacity Management Tool, which is a web-based program used by Infrastructure Managers, Railway Undertakings, and other stakeholders in the railway sector for the planning and organising of railway capacity.

The aim of the following documentation is to provide an overview of ECMT's structure and functionalities, especially object creation, harmonisation, and visualisation as part of the Capacity Model.

1.1 General Overview and Purpose

ECMT provides a centralised platform to plan, harmonise, and view railway capacity for upcoming timetable periods. The tool consolidates capacity needs and capacity restrictions on railway infrastructure based on information provided by Infrastructure Managers (IMs), Allocation Bodies (ABs) and applicants. ECMT offers Capacity Supply and Capacity Model visualisations and other related functionalities.

ECMT was first launched as part of the Timetable Redesign for Smart Capacity Management (TTR) Pilots and currently plays an important role as the capacity hub in the TTR IT and digital capacity management Landscape.

1.2 TTR and the Advance Capacity Planning Phase

TTR is a sector-driven initiative aimed at redefining the processes used to plan trains in order to promote better integration in the European railway area and to leverage the power of modern information technology.

TTR is divided between advanced capacity planning (ACP) and timetabling phases. The ACP phase is characterised by the earlier planning of trains compared to today, the planning of trains in a cooperative way between IMs, a central role for coordinating and delivering market input to IMs from applicants, and the use of common IT tools and frameworks to facilitate this process.

1.3 ECMT Modules

The European Capacity Management Tool contains two modules for facilitating the Advance Capacity Planning Phase: the Capacity Model and the Capacity Supply.

1.3.1 Capacity Model

The Capacity Model forms a part of the Advance Capacity Planning phase of the TTR process.

1.3.1.1 Capacity Model Definition

The Capacity Model aims to show, harmonise, and discuss in more detail the expected volume of capacity consumed by each market segment (freight, passenger, etc) and by temporary capacity restrictions (reductions in available capacity due to planned maintenance or repair work). The Capacity Model does not define exact paths, nor does it define specific temporary capacity restriction (TCR) details.

The Capacity Model itself is a 24-hour overview indicating the expected positive (train volumes) and negative (TCRs) capacity during each hour of the day.

1.3.1.2 Capacity Model Added Value

The Capacity Model provides many benefits to the sector, including:

- Supporting the harmonisation of the cross-border capacity planning
- Providing an overview on the available capacities on a European scale
- Providing an overview concerning the infrastructure sections where possible future capacity bottlenecks can occur
- Facilitating the consultation on traffic solutions during TCR periods by providing a standardised, transparent platform for every involved stakeholder
- Providing a base to implement smart functionalities in the future (optimalisation etc.)

1.2.1.3 The Role of ECMT in the Capacity Model

Rail Net Europe provides ECMT to serve as a common platform for the submission of Capacity Needs Announcements (CNAs) for applicants, as well as the international coordination, publication, and consultation of Capacity Models for IMs.

ECMT supports both the Applicants and IMs in carrying forward CNAs and Capacity Models from one timetable period to another, with the possibility of adjusting them according to new capacity needs.

While Rail Net Europe provides ECMT as the capacity hub for the ACP phase of TTR, it makes up only one part of the TTR Digital Capacity Management landscape (DCM), which also includes the TCR Tool for managing and coordinating TCRs, and the Path Coordination System (PCS) for the timetabling phase of TTR. Further information about DCM can be found on RNE's website (https://rne.eu/).

1.2.2 Capacity Supply

The Capacity Supply is a process which is still under development and piloting by the sector, as such, the Capacity Supply and its objects are not detailed in this version of the ECMT Training Manual.

1.4 Objects in ECMT

Objects represent different types of Preplanned Capacity with defined characteristics and properties and can include planned capacity volumes (Capacity Model phase), capacity available for requests by applicants (Capacity Supply), capacity reserved for infrastructure works (TCRs) and capacity which has already been allocated. All objects are either created in or imported into ECMT by IM users, except for CNAs, which are created or imported by applicants.

The Capacity Model is divided between positive and negative capacity, both of these categories can be divided into several types of objects.

1.4.1 Capacity Model Object

A Capacity Model Object (CMO) represents one volume of train run between any two given points on a railway network. CMOs can only be created by IMs and can only be created within one IMs territory.

At a basic level, a CMO is defined by an owner (the company of the user that created it), the category and type of service (freight, passenger, national, international, annual timetable, Ad hoc, etc.), the validity period and calendar (the schedule for what days and during which times the volume exists), and the route information (origin, destination, and waypoints).

1.4.2 Capacity Needs Announcements

CNAs represent the market input to the ACP process. CNAs can only be created by applicants and can be created between any two points on the railway network (CNAs can be national or international). In the

case of international CNAs, ECMT facilitates the harmonisation of CNAs between the relevant RUs prior to submission to the IM.

CNAs are defined by nearly identical criteria as CMOs, making it easy for IMs to build their CMOs, and thus their Capacity Models, off of market needs. This results in a more efficient and business friendly planning process and timetable.

1.4.3 Intended Capacity Line

The Intended capacity Line (ICL) is an important aspect of the Capacity Model. The ICL indicates the maximum number of volumes (capacities) which can be accommodated without paying special attention to capacity planning/extraordinary traffic management measures. The aim for the calculation of the intended capacity line is to provide a clear picture on the planned capacity situation and to detect pressure points where the IMs have to make additional efforts to ensure the stability of the timetable.

The ICL provides IMs and applicants with a clear picture on the number of unplanned capacities in the Capacity Model, which could be available for Ad Hoc requests later on during the timetabling phase of the TTR process.

The ICL is always created or imported by users of the IM on whose territory the ICL section is being applied. ICLs are defined by a number of volumes per hour for every hour of the day on any given section of track during a given time period.

1.4.4 Temporary Capacity Restrictions

TCRs represent negative capacity and are caused by planned maintenance or repairs to railway infrastructure. A TCR can result in a 100% reduction in available capacity (temporary total closure) or a lesser reduction in the amount of available capacity which still allows some capacity to remain.

TCRs can be generally defined by the following criteria: the owner (the company upon whose network the TCR occurs), the timeframe (validity period, year, dates, times in which the TCR occurs), the estimated percent of affected travel volume (calculated based on the ICL), the reason for the restriction, and location data (start point, end point, and way points).

TCRs are always imported into ECMT by Infrastructure Managers. TCRs are managed and harmonised between IMs in the TCR Tool. Further information about the TCR Tool can be found on RNE's website (https://rne.eu/).

2 Capacity Model Objects (CMO)

Capacity Model Objects represent one volume of train run on a certain route between certain times. CMOs are created by IMs during the advanced planning phase of the TTR process. CMOs can be created by IMs taking into account market input provided by applicants through the Capacity Needs Announcement process, for more information on CNAs, see section 2.

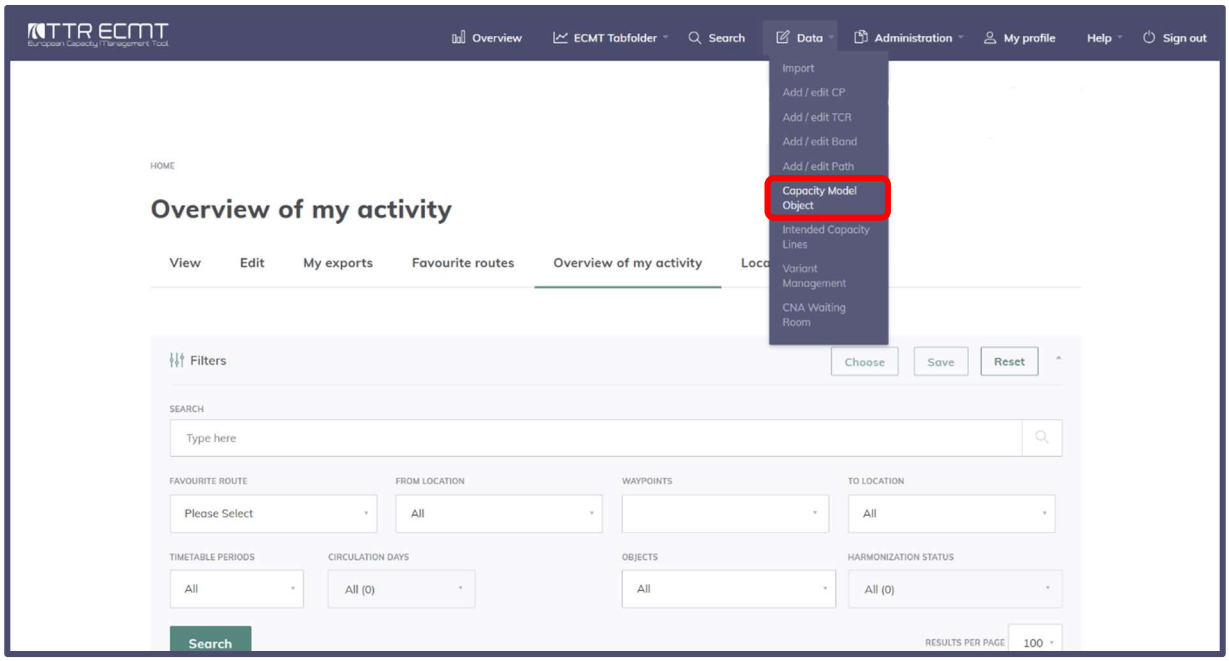
This chapter will provide a comprehensive overview on the creation, viewing, and harmonisation of CMOs.

2.1 Object Creation

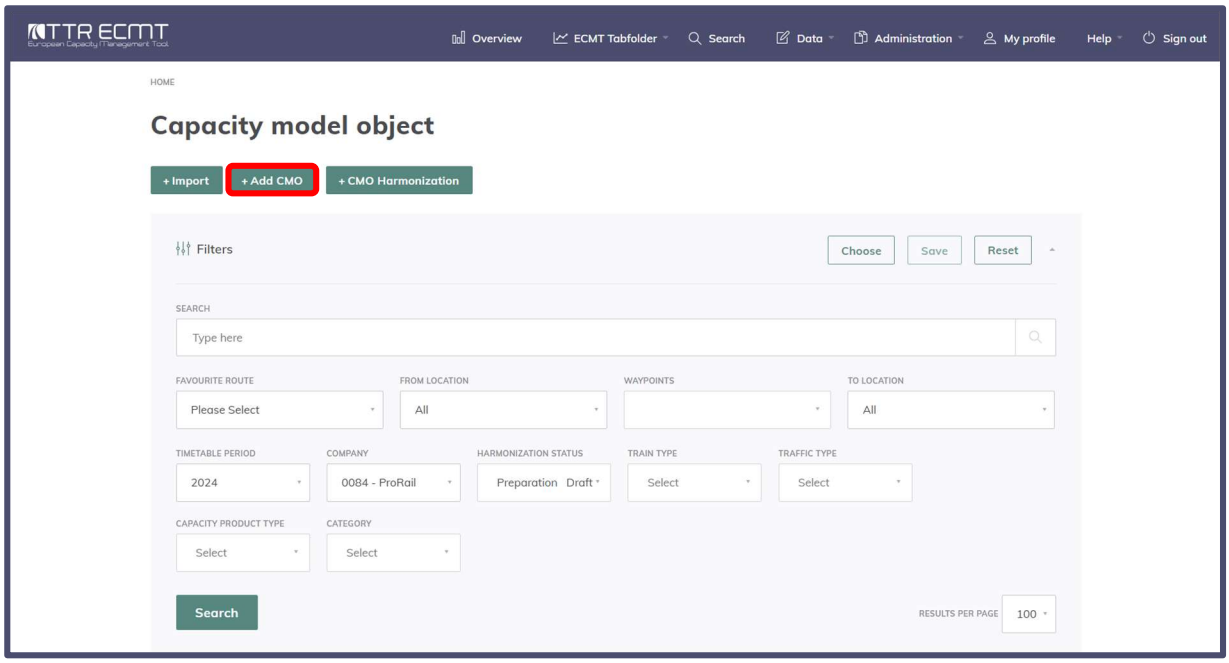
CMOs can be created by IMs directly in ECMT or they can be imported via Excel. Additionally, new CMOs can be created within the tool by cloning or creating frequencies of existing CMOs.

2.1.1 CMO Manual Creation

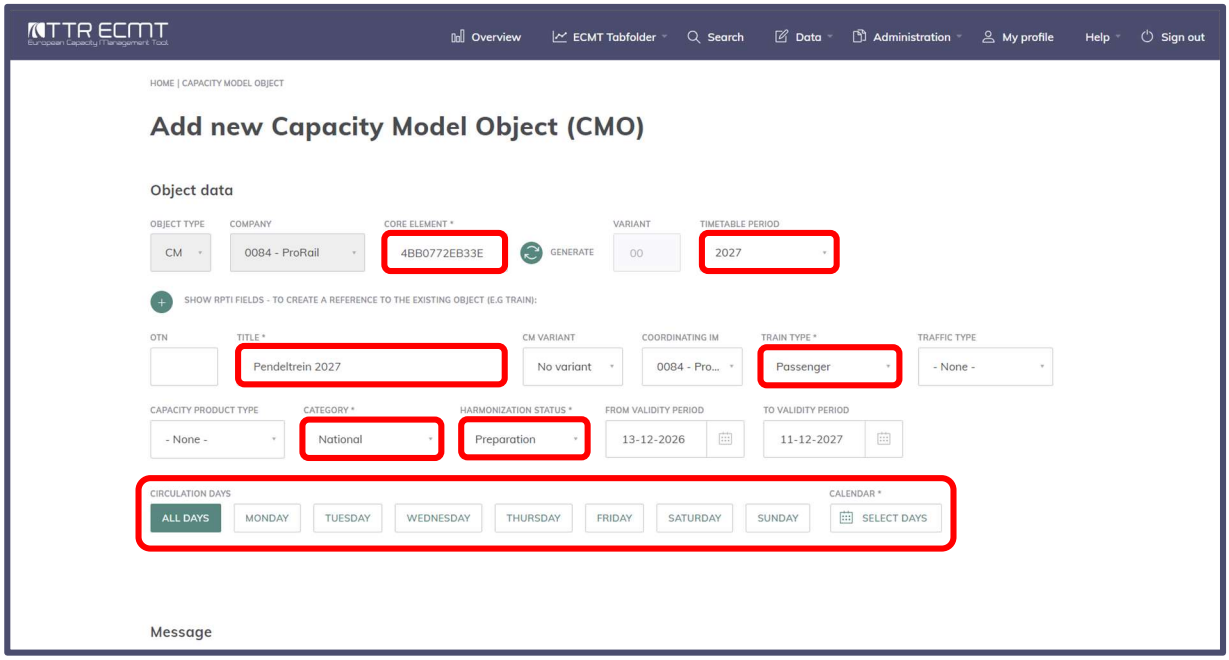
Capacity Model Objects can be created directly through ECMT's graphical user interface. To start, the user should select 'Capacity Model Object' from the 'Data' dropdown menu:



On the following page, the user can view existing CMOs by adjusting the filters. The user additionally has the option on this page to manually create CMOs, import CMOs via Excel file, and conduct CMO Harmonisation. Select 'add CMO' to manually create a CMO:



On the create CMO page, the user will input all relevant information for the Capacity Model Object. The mandatory fields are circled in red:



Object Type	Automatically shows ‘CM’ for Capacity Model Object
Company	Automatically set to the user’s company
Core Element*	Unique 12 character alphanumeric identifier for the object, can be manually created or automatically generated
Variant	Not editable when creating a new object, can be used to indicate versioning when creating copies of the object
Timetable Period*	The timetable year in which this CMO will apply
OTN	Operational Train Number

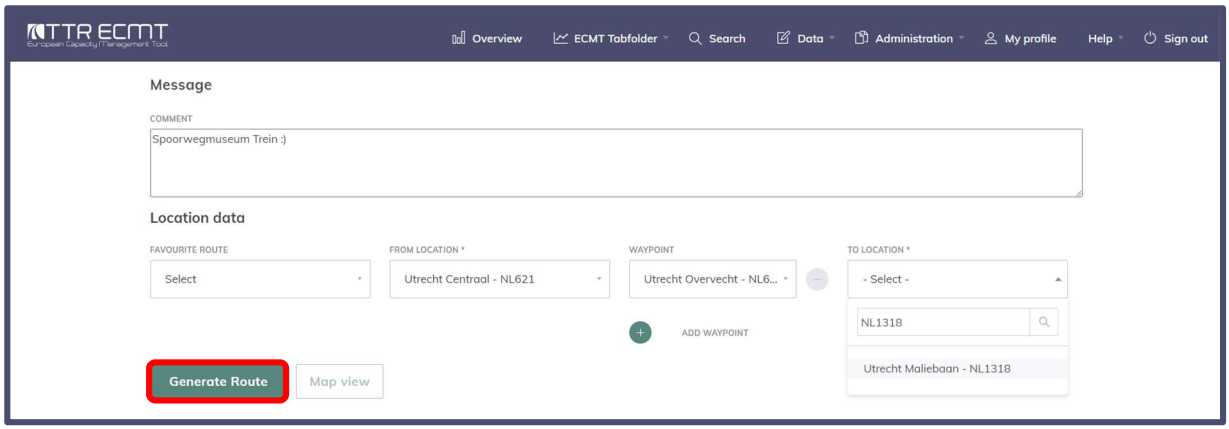
Title*	Title of the object which can be used to easier find the object within ECMT
CM Variant	The user can create Capacity Model Variants which apply an altered validity period and set the CMO to apply to this variant. For example, there could be a weekend variant, a summer period variant, or a variant for a particular TCR
Coordinating IM	Automatically set to the user's company. If the CMO affects another IM then that company can be indicated here.
Train Type*	Freight, Passenger, or Other
Traffic Type	None, High speed, Long distance, Express regional, or Regional
Capacity Product Type	None, Annual TT, Rolling Planning, Ad-hoc, Unplanned
Category*	National or International
Harmonisation Status*	Indication of the status of this CMO in terms of alignment with other affected IMs – the options are Preparation, Draft, Published final, or Closed
From/To Validity Period	Automatically fills in the dates of the selected timetable period
Circulation Days/Calendar*	Either circulation days or calendar must be filled in. 'All Days' will select every day of the selected timetable year, selecting any combination of weekdays will cause the CMO to occur on every occurrence of that day(s) throughout the year. For irregular running patterns, specific days of the year can be chosen from 'Calendar'

Upon filling in the necessary fields, the user can provide a comment under 'Message', this will attach the comment to the CMO and will be visible to all who have the right to view the object.

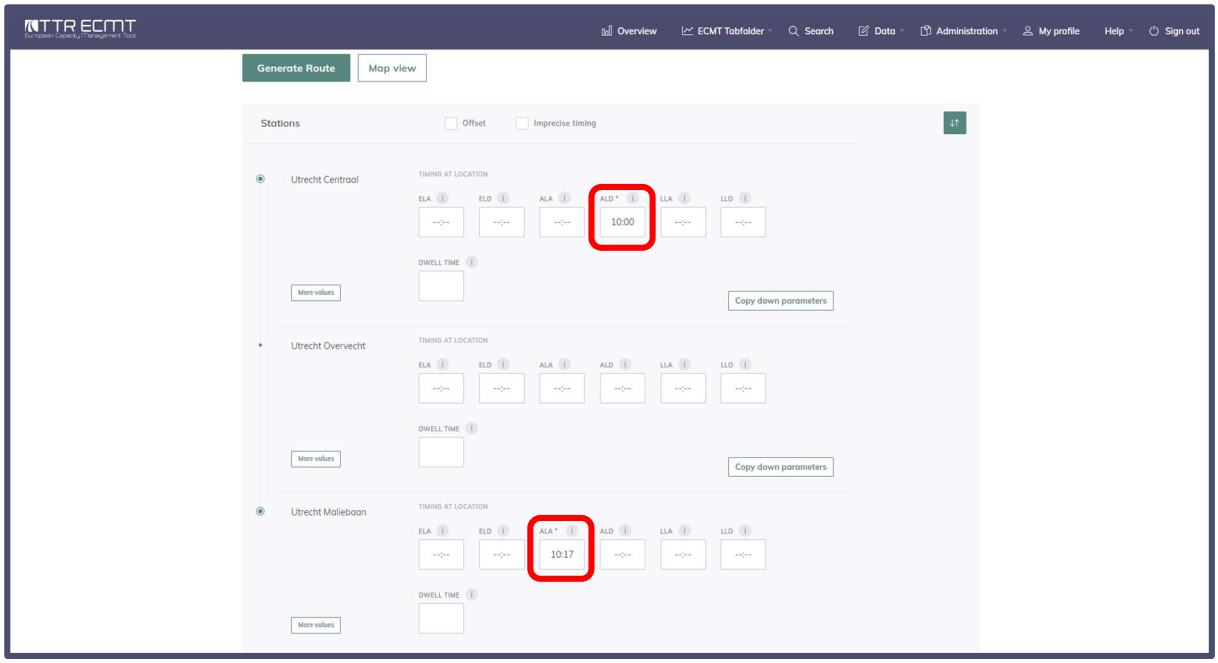
The user can then indicate the origin and destination points for the object, and, if necessary, the waypoints. From, to, and waypoints are determined by PLCs (primary location codes). The PLCs can be searched either by their number or title. Alternatively, the user can set a 'Favourite Route' by going to 'My Profile' > 'Favourite routes'. Once a favourite route has been created, the user will be able to select that route from the drop down and the PLCs will automatically be filled in.

Users will only be able to create CMOs using PLCs which belong to their company, unless their company has been given access to a given PLC by a neighbouring IM, see **section 5.4.1** for more information on cross territory PLC rights.

After selecting the origin, waypoint(s), and destination, the user should select 'generate route'



Upon selecting 'Generate Route' ECMT will display an overview with the origin, destination, and waypoint(s) (if included), as well as several fields for indicating timing data. The field ALD (departure time) at the origin and the field ALA (arrival time) at the destination must be filled in by the user in order to create the CMO:



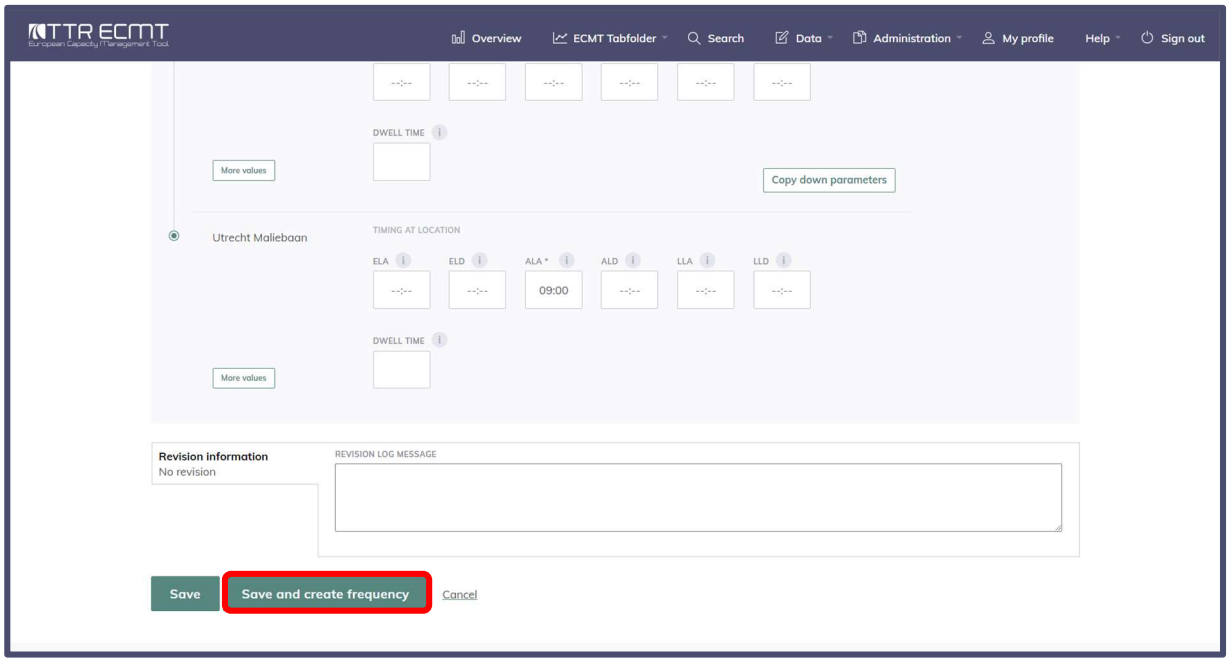
Generate Route	The user must generate the route in order to create the CMO
Map View	Allows the user to visualise the route on a map
Offset	If the CMO runs through midnight, select 'offset' and select an offset '1' at locations which the train runs through after midnight. This can be repeated with 2, 3, etc., when the train runs for more than two days
Imprecise timing	Indicates that the times are not definite
⇵	Swaps the origin and destination
ELA	Desired earliest arrival at waypoint
ELD	Desired earliest departure from waypoint
ALA*	Desired actual arrival at waypoint
ALD*	Desired actual departure from waypoint

LLA	Desired latest arrival at waypoint
LLD	Desired latest departure from waypoint
Dwell Time	Minimum amount of time the train will be stopped at the waypoint
More Values	The user can additionally indicate parameters such as weight, length, acceleration, and planned speed, as well as combined transport profile and the type of stop
Copy down parameters	Copies additional location-specific parameters (including those found when clicking "more values"

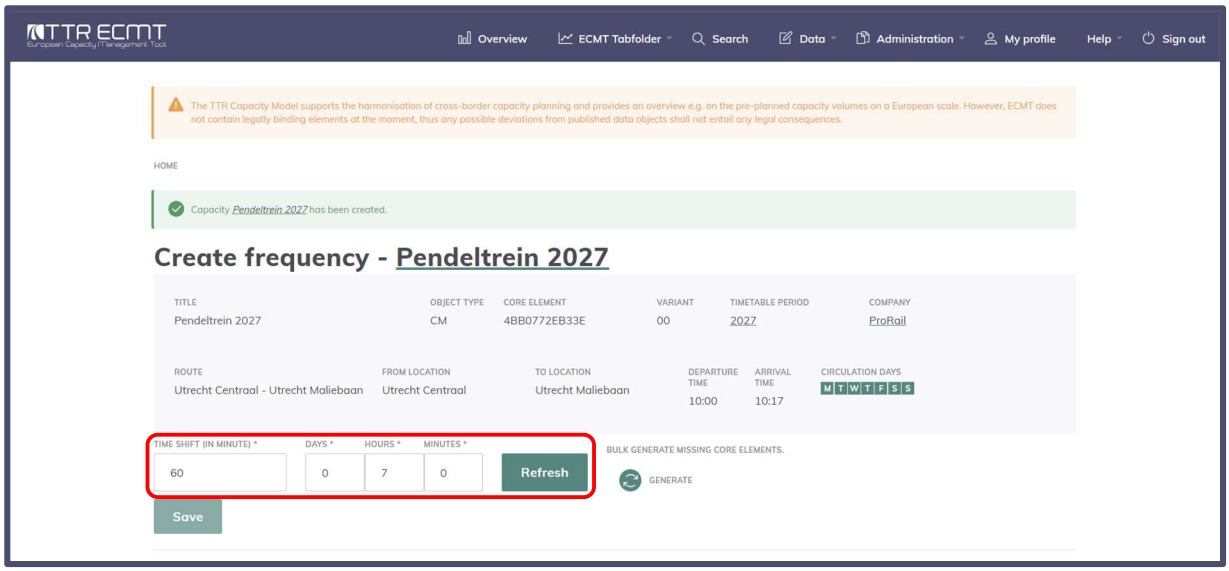
Once the user has filled in the ALD at the origin and the ALA at the destination, as well as any of the optional parameters, the CMO can be saved by selecting ‘save’. Once saved, the CMO will be created and searchable within ECMT, and can be found in the user’s ‘overview’ page.

Alternatively, if this CMO will be repeating on a regular basis, the user can select ‘Save and create frequency’

2.1.2 CMO Frequency Creation

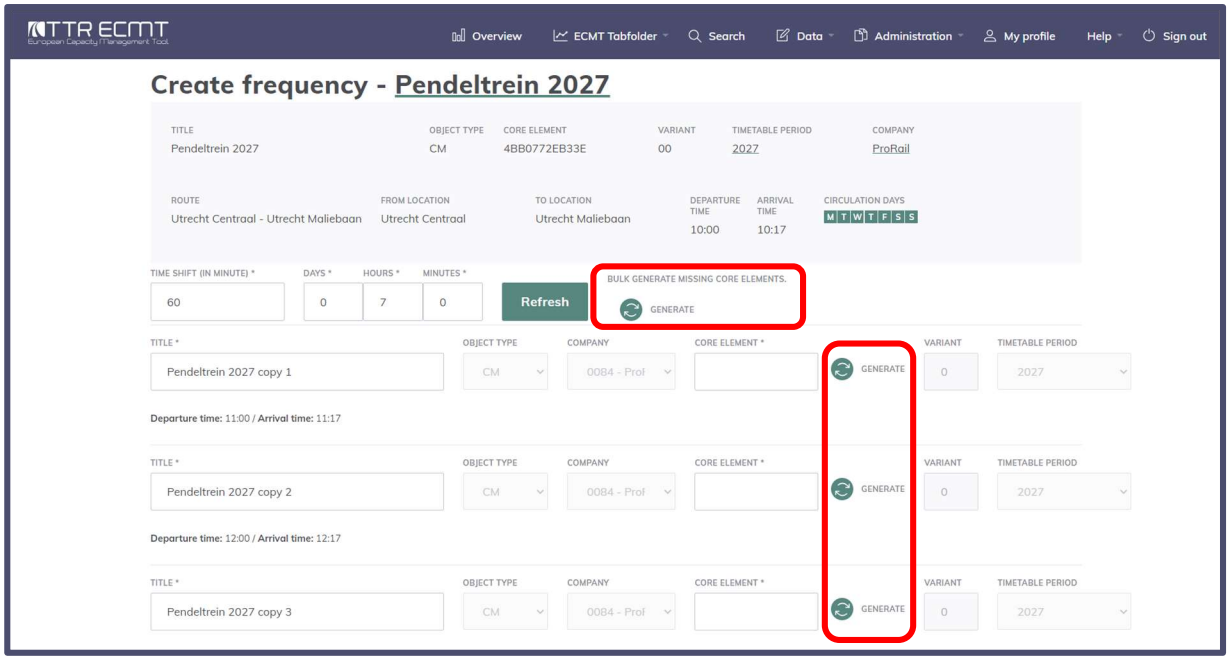


Selecting ‘save and create frequency’ will create the object and automatically bring the user to the create frequency page for that object. The user will see an overview of the object’s information as well as the mandatory fields ‘time shift (in minutes)’ and ‘days, hours, minutes’.



Time Shift (in Minutes)	How many minutes in the future the copy of the object should be created
Days/hours/minutes	For how long the user would like the tool to create copies for

In this example, the train runs once an hour between 10:00 and 17:00 every day of the week, and the original CMO runs from 10:00 to 10:17. Thus the time shift is set to one hour (60 minutes), and it is set to repeat for 7 hours.



Every copy must have a Core Element. The core elements can be manually indicated per object, automatically generated per object, or automatically generated for every object at once using the 'Bulk Generate Missing Core Elements' button.

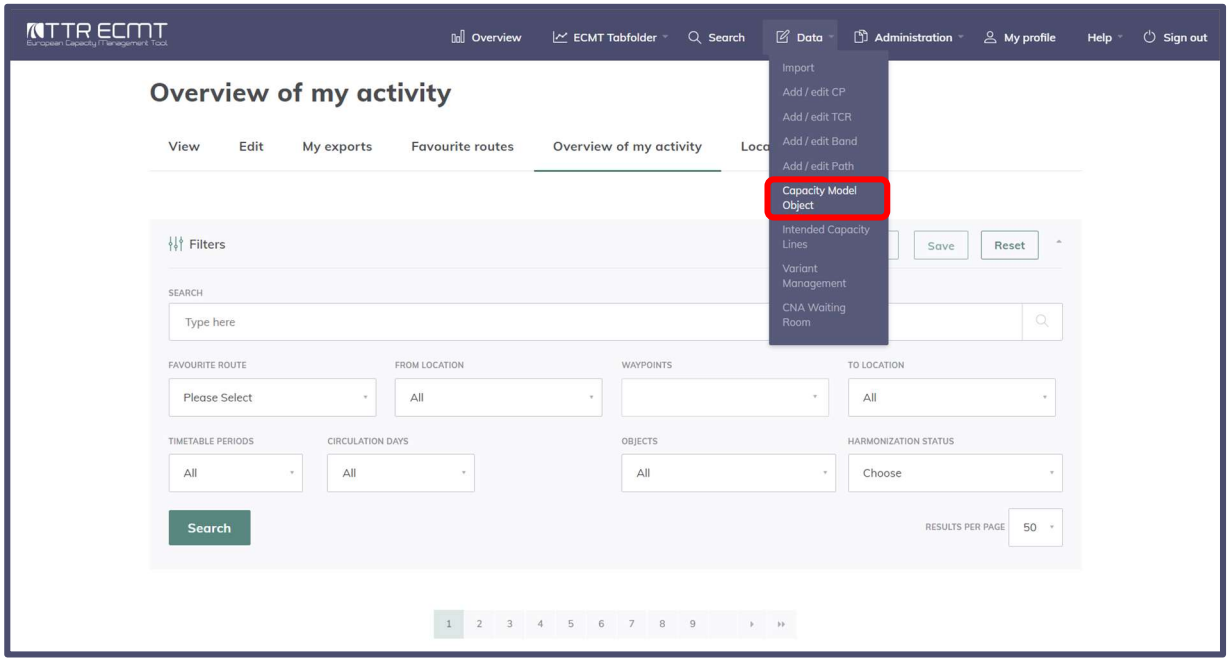
Select 'Save' to create the copies. The copies and the original can then be found the Capacity Model segment overview and line overview. For more information on the overviews, see section 1.2.

2.1.3 CMO Excel Import

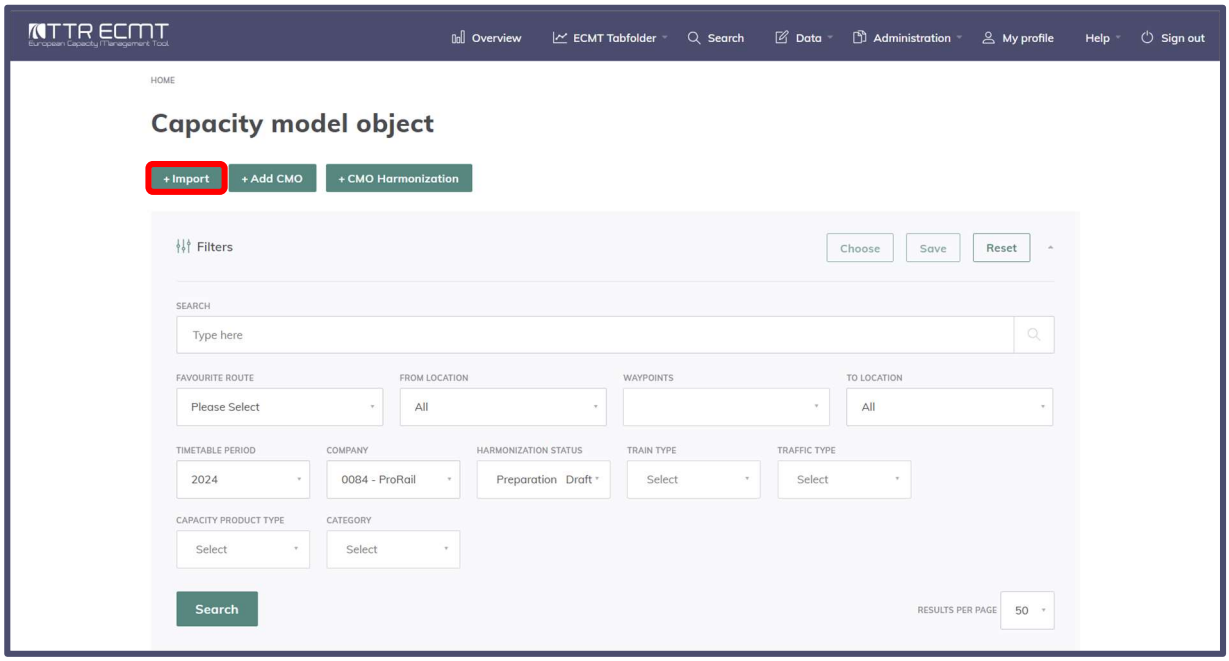
IM users may choose to import their CMOs via Excel rather than create them manually. This option is especially helpful where there is a high number of CMOs, and the IM is able to create an Excel extract of their objects via their national system. This can save a lot of work and time when IMs are on a deadline for including a particular year's CMOs in the Capacity Model.

2.1.3.1 Process in ECMT

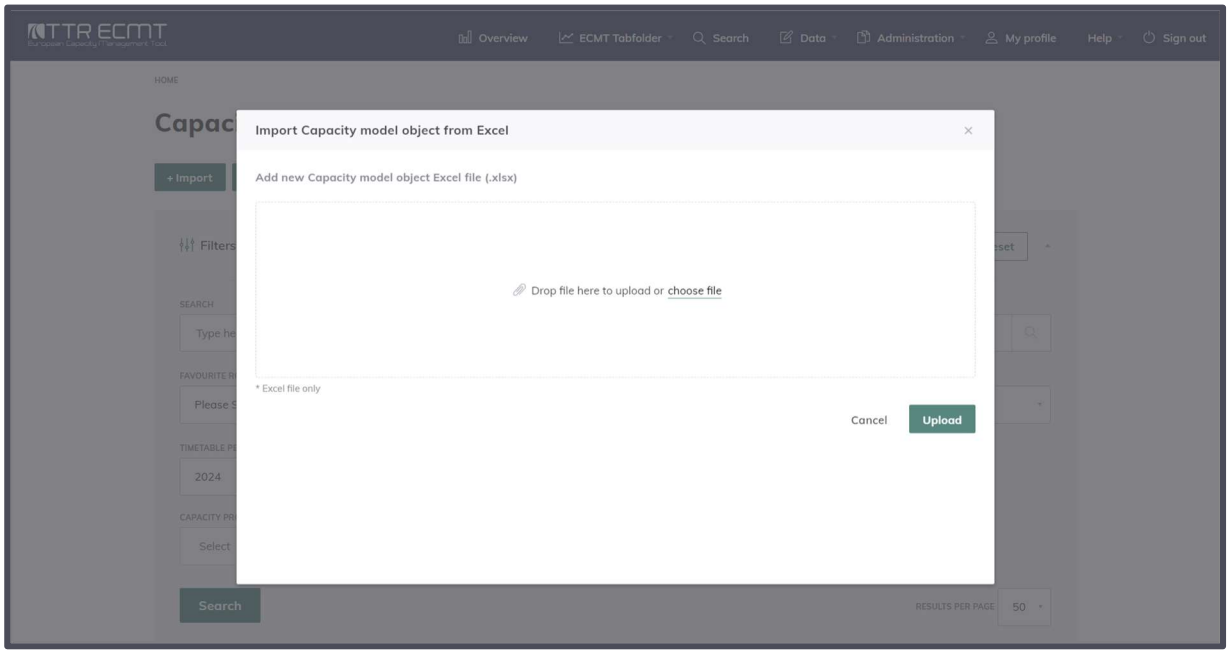
To import CMOs via Excel, select 'Capacity Model Object' from the 'Data' dropdown menu:



The user will arrive at the CMO page, where they can view existing CMOs, create new CMOs, or conduct CMO harmonisation. To import a CMO via Excel file, select '+ Import':



Selecting '+ Import' will prompt the user with the ability to drop a file or select one from their files:



2.1.3.2 CMOs in Excel

The data to be included in a CMO Excel file is roughly the same data which must be inputted when manually creating a CMO in ECMT. In order to successfully import CMOs into ECMT via an Excel file, this data must be organised in a specific format.

The following is a table indicating each column which must be present in the excel file. Mandatory fields are indicated with an asterisk (*). The text in the column header must match exactly what is shown in the table. A template of the excel format can be downloaded via ECMT by selecting 'Import Sheets' under the 'Help' tab.

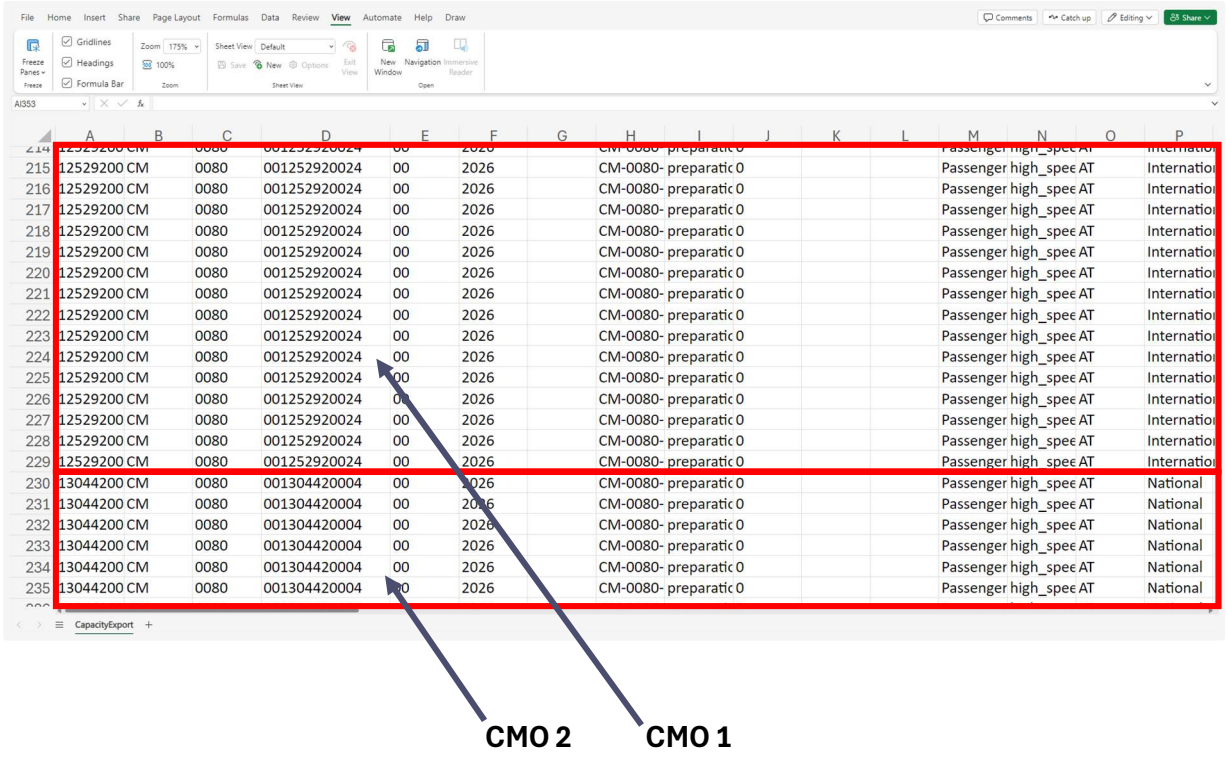
CMO Import Sheet Fields (valid from timetable year 2026)		
Field	**Column**	**Description**
ID	**A**	Not mandatory from timetable year 2026
ObjectType	**B**	Not mandatory as ECMT will recognise that the object as CM (CMO) when importing through the CMO import page
Company	**C**	Not mandatory as ECMT will automatically recognise the company as the importing user's company
Core*	**D**	12 character alphanumeric string
Variant	**E**	
TimetableYear*	**F**	The timetable year in question (2026, 2027, etc.)
RPTI_ObjectType	**G**	(Reference Planned Transport Identifier) relates a CMO to a past train run. All the "RPTI"-fields refer to the respective field of the object being referenced (i.e. "RPTI_Company" is the Company-value of the referenced train, etc.)
RPTI_Company	**H**	
RPTI_Core	**I**	
RPTI_Variant	**J**	
RPTI_TimetableYear	**K**	
ReasonOfReference	**L**	
OTN	**M**	Operational Train Number

Title*	**N**	Free text title of the object
Harmonization status	**O**	Preparation, Draft, Published final, or closed
CMVariant	**P**	If the user has created CM variants in ECMT, they can include the title of the variant here, which will also adjust the active days of the CMO.
LeadRU	**Q**	
CoordinatingIM	**R**	
TrainType*	**S**	Freight, Passenger, or Other
TrafficType	**T**	High_speed, Long_Distance, Express_regional, Regional, Wagonload, Blocktrain, Combined_transport
CapacityProductType	**U**	Annual TT, Rolling Planning, Ad-Hoc, or Unplanned
Category*	**V**	National, International
StatusQuo	**W**	
TrafficContracted	**X**	
TypeOfContract	**Y**	
MaxJourneyTime	**Z**	
CountryCodeISO*	**AA**	Two capital letter country indicator (ex: Austria = AT). Full list of codes available here: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Country_codes
LocationPrimaryCode*	**AB**	Numeric PLC code without the country code
PrimaryLocationName	**AC**	Optional: the only location data that will be read is the PLC code and corresponding country code
TrainActivity	**AD**	Indicated by a four digit code, see annex A for the list of codes and their meanings
ELA	**AE**	Earliest desired arrival
ELA Offset	**AF**	If the train runs through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
ELD	**AG**	Earliest desired departure
ELD Offset	**AH**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
ALA*	**AI**	Desired arrival - mandatory for destination
ALA Offset	**AJ**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
ALD*	**AK**	Desired departure - mandatory for origin
ALD Offset	**AL**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
LLA	**AM**	Latest desired arrival
LLA Offset	**AN**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
LLD	**AO**	Latest desired departure

LLD Offset	**AP**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
DwellTime	**AQ**	Minimum dwell time given in minutes
MaxJourneyTimeSection	**AR**	
ResponsibleApplicant	**AS**	
TrainWeight	**AT**	
TrainLength	**AU**	
TrainMaxSpeed	**AV**	
PlannedSpeed	**AW**	
Acceleration	**AX**	
BrakeType	**AY**	
BrakingRatio	**AZ**	
NumberOfLocos	**BA**	
PushPullTrain	**BB**	
RollingStockType	**BC**	
ETCSOnBoard	**BD**	European Train Control System
P1	**BE**	Combined transport profile - only to be filled for combined transport trains
C1	**BF**	Combined transport profile - only to be filled for combined transport trains
P2	**BG**	Combined transport profile - only to be filled for combined transport trains
C2	**BH**	Combined transport profile - only to be filled for combined transport trains
DangerousGoodsIncluded	**BI**	
ExceptionalTransport	**BJ**	
TiltingFunction	**BK**	
ValidFrom*	**BL**	Mandatory: please use a Date-Format in this field. The date has to be within the timetable year specified in Column F.
ValidTo*	**BM**	Mandatory: Please use a Date-Format in this field. The date has to be within the timetable year specified in Column F.
Monday*	**BN**	Conditionally mandatory: Either Circulation Days (BG-BM), TimeUnit and Frequency (BN-BO) or Bitmapdays (BP) has to be given. If multiple are given, Bitmapdays is given priority. (Bitmapdays > Weekdays > Frequency)
Tuesday*	**BO**	
Wednesday*	**BP**	
Thursday*	**BQ**	
Friday*	**BR**	
Saturday*	**BS**	
Sunday*	**BT**	

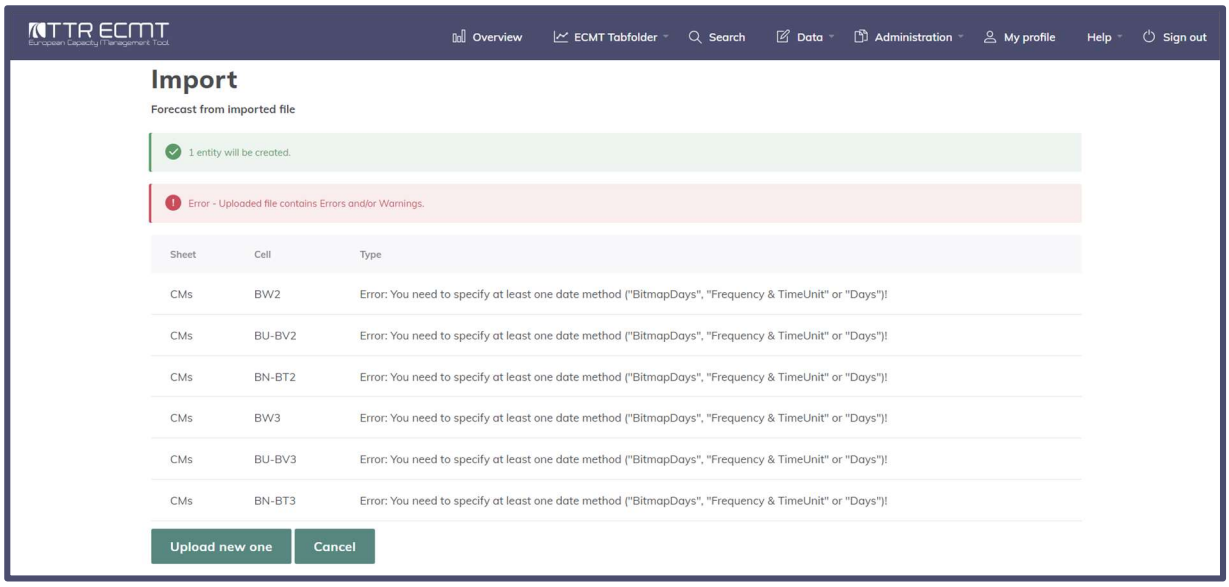
TimeUnit*	**BU**	Conditionally Mandatory: Accepted inputs are Minute, Hourly, Daily, Weekly, Monthly, Annually. Either Circulation Days (BG-BM), TimeUnit and Frequency (BN-BO) or Bitmapdays (BP) has to be given. If multiple are given, Bitmapdays is given priority. (Bitmapdays > Weekdays > Frequency)
Frequency*	**BV**	Conditionally Mandatory. Either Circulation Days (BG-BM), TimeUnit and Frequency (BN-BO) or Bitmapdays (BP) has to be given. If multiple are given, Bitmapdays is given priority. (Bitmapdays > Weekdays > Frequency)
BitmapDays*	**BW**	Conditionally Mandatory. Accepted Input: String of 1/0 the length of the validity period. Each character corresponds to a day of the period.
Comment	**BX**	Comments can be optionally attached to the CMO

One Excel sheet can contain many CMOs. Each row of the CMO import sheet should correspond to one primary location, ordered correctly in the direction of train run from top to bottom. CMOs will be recognised as distinct from one another in the excel sheet by their core elements.

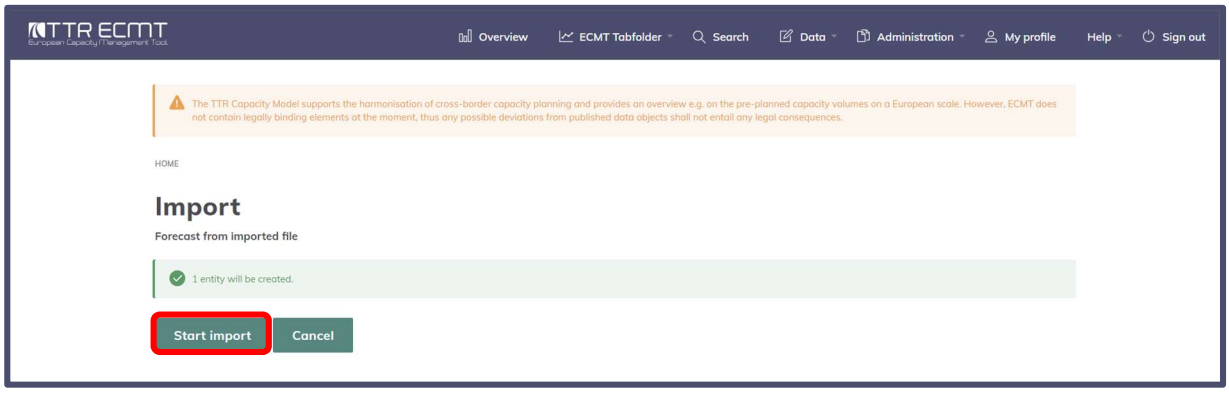


2.1.3.3 Validation and Final Creation of CMOs via Excel Import

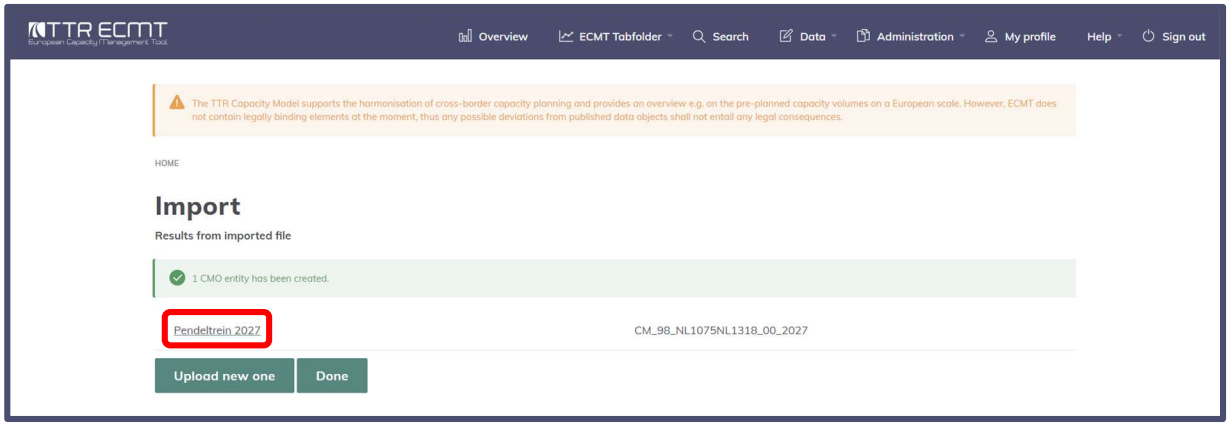
ECMT is currently able to handle CMO imports of up to 10.000 rows. Upon the initial import of the excel sheet, the user will arrive at the validator page. If there are any errors in the syntax of the excel file, they will be identified by the system and presented to the user. In the below example, the user has neglected to include mandatory time unit information, and thus is not given the ability to finish the import process:



Upon making the necessary fixes in the excel import, the user should try re-importing the file. If all errors have been corrected, then there will be no error messages from the validator, and the user can select 'Start import' to import the CMO(s) into ECMT. Once the CMO is created, the user can select the link to view its details page, where the CMO can also be edited or deleted.



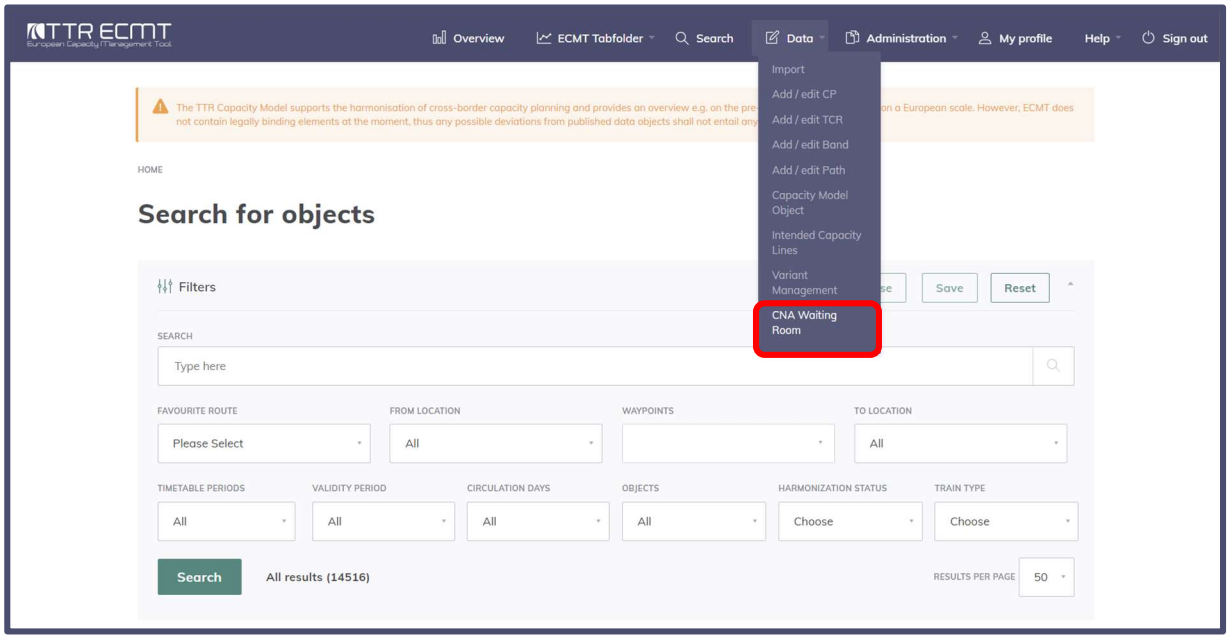
Once the CMO is created, the user can select the link to view its details page, where the CMO can also be edited or deleted.



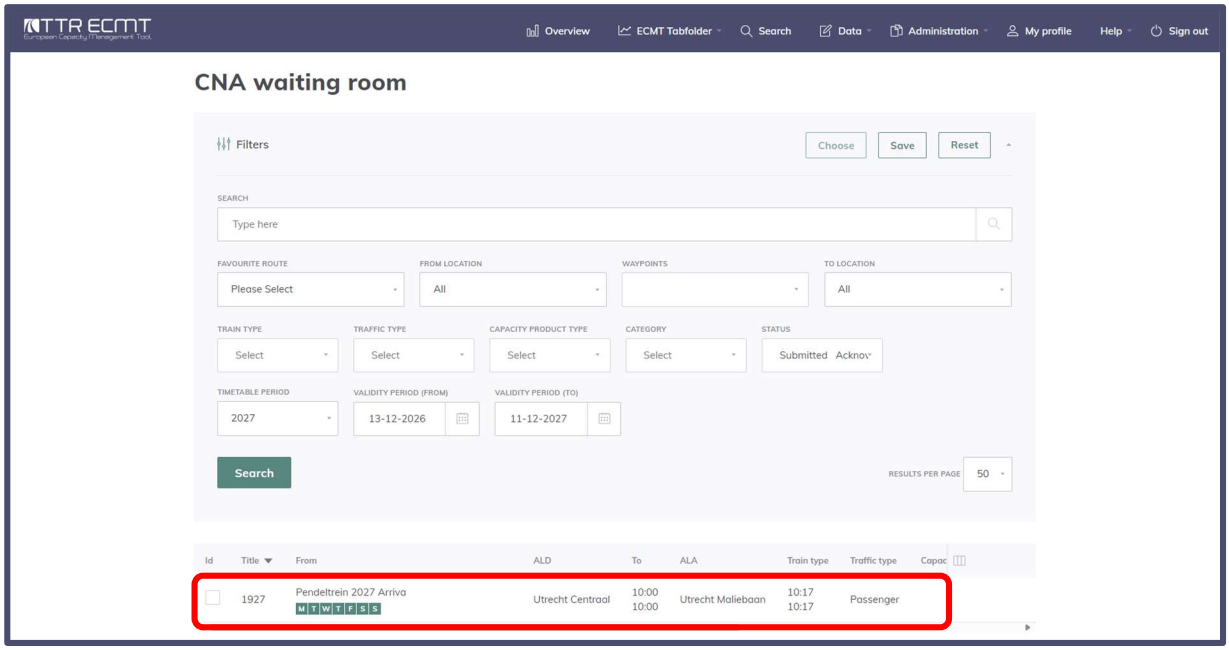
2.1.4 Creating a CMO from a CNA

Infrastructure Managers receive market input as a basis for how they should partition their capacity in the timetable year in question. This input is provided through Capacity Needs Announcements. IM users can view CNA which have been submitted by applicants wishing to operate on their territory, and have the possibility to create a CMO from a CNA in ECMT.

To view relevant CNA's, the user should select 'CNA Waiting Room' under the 'Data' tab:

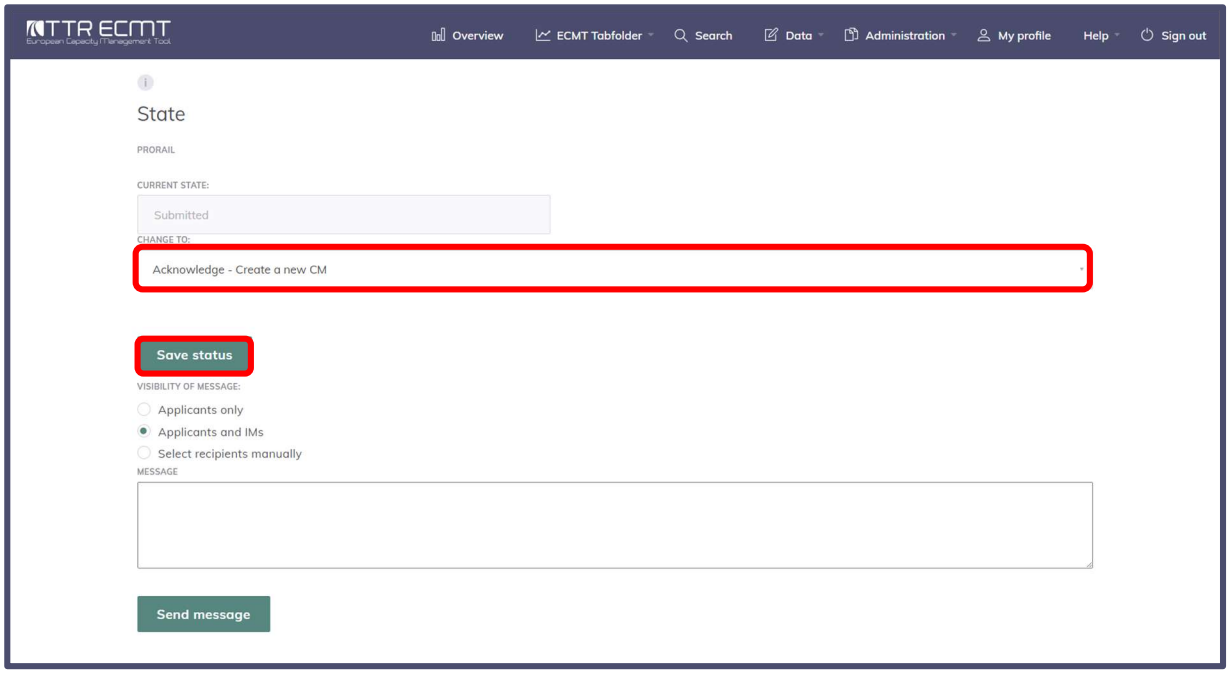


In the CNA waiting room, the user will find all CNAs to which the user's company is affected. The user can filter the route, traffic type, timetable period, and other parameters to find the desired CNA. When the desired CNA is located, the user can select it:

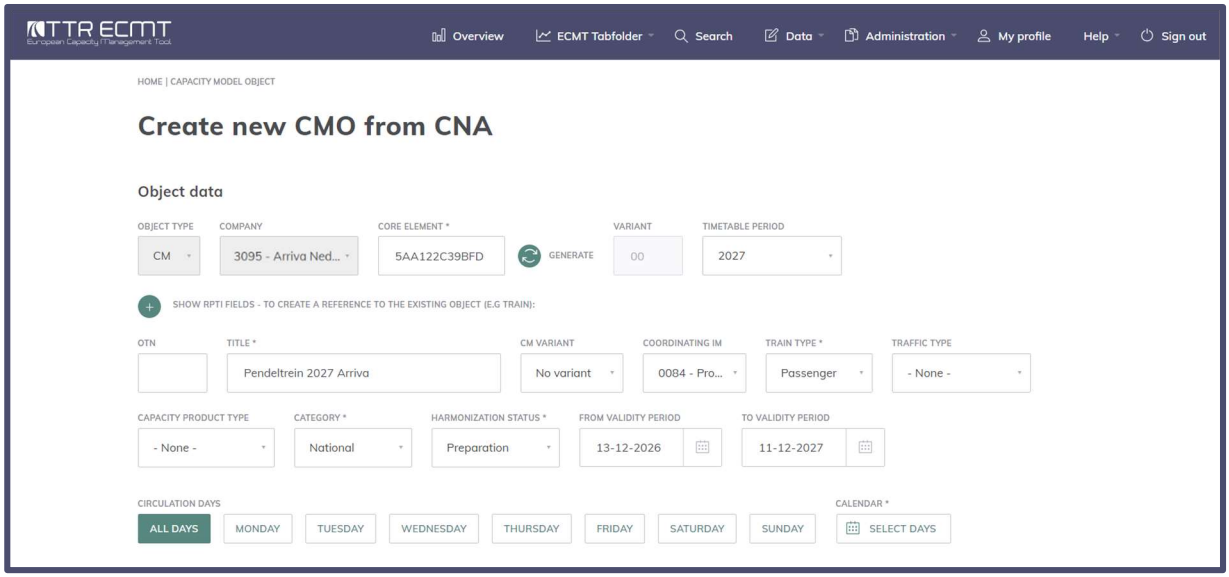


Selecting the CNA brings the user to the CNA's detail page. Here, the user can view all of the CNA's data, including the company, route, timetable, calendar, and more. By scrolling to the bottom of the page, under 'State' the user will find a drop-down menu where they can change the status of the CNA.

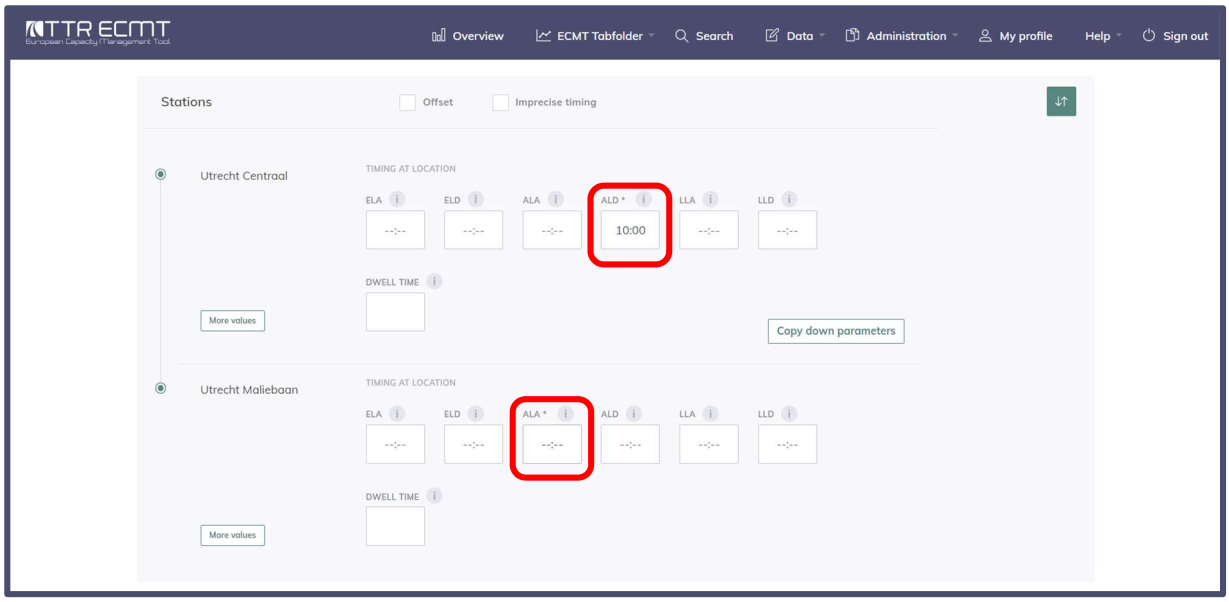
Selecting ‘Acknowledge – Create a new CM’ followed by selecting ‘Save status’ will take the user to the create CMO page with the CNA’s data already copied into the fields.



The user should confirm that all information which has automatically been put into the fields of the CMO creation page are accurate.



Unlike CMOs, ALD (for origin) and ALA (for destination) are not mandatory fields for CNAs. Thus, it is possible that the user will need to fill in these fields in order to successfully create the CMO.

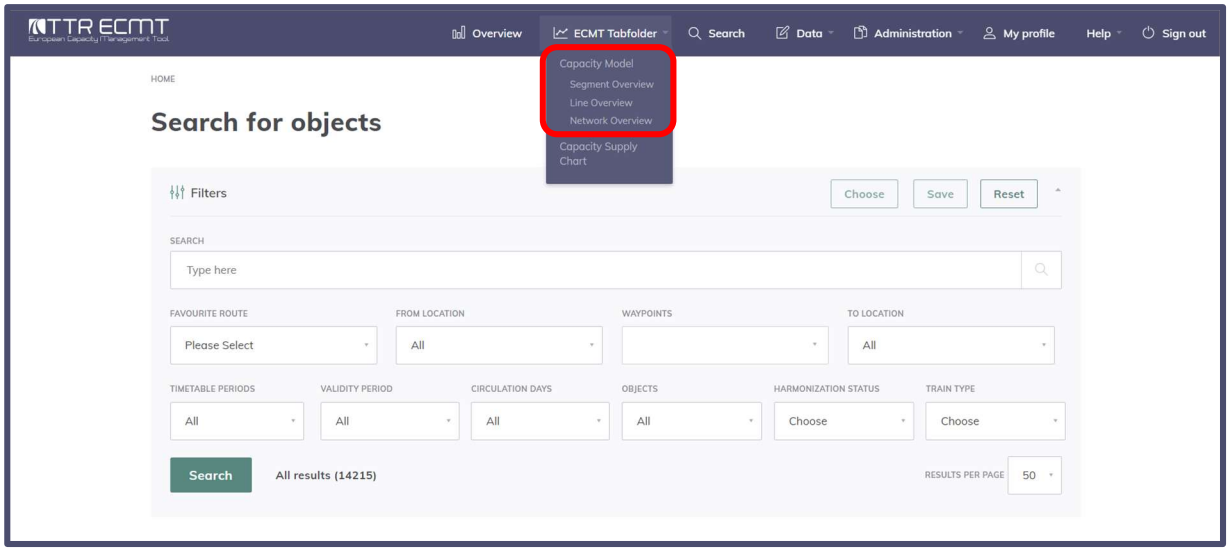


Selecting 'Save' will create the CMO. And selecting 'Save and create frequency' will allow the user to create regular copies of the object (see section 1.1.2).

2.1 Capacity Model Overviews

ECMT provides several methods of visualising Capacity Model Objects, as defined by the sector in the Capacity Model Handbook. These visualisations include the Segment Overview, Line Overview, and Network Overview.

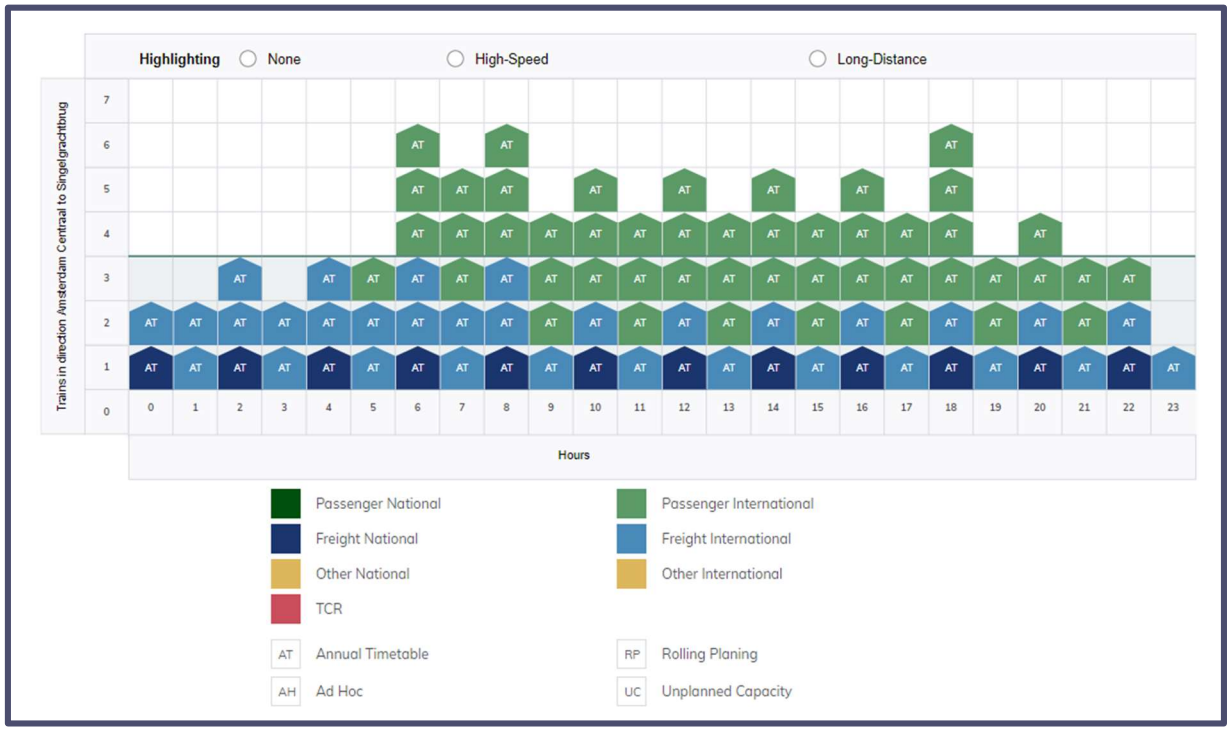
To access the Capacity Model charts, the user should hover over the ECMT tab-folder, there they will be able to select one of the three overviews.



2.1.1 Segment Overview

The Segment Overview is the first overview that is available for visualising the Capacity Model. The Segment Overview displays Capacity Model Objects, each equalling one volume of capacity, and each existing within one hour of the day. The following visual shows a blank Capacity Model Chart. The X axis consists of the hours of the day and the Y axis consists of the number of volumes (in other words, the number of train runs) that each hour can contain.

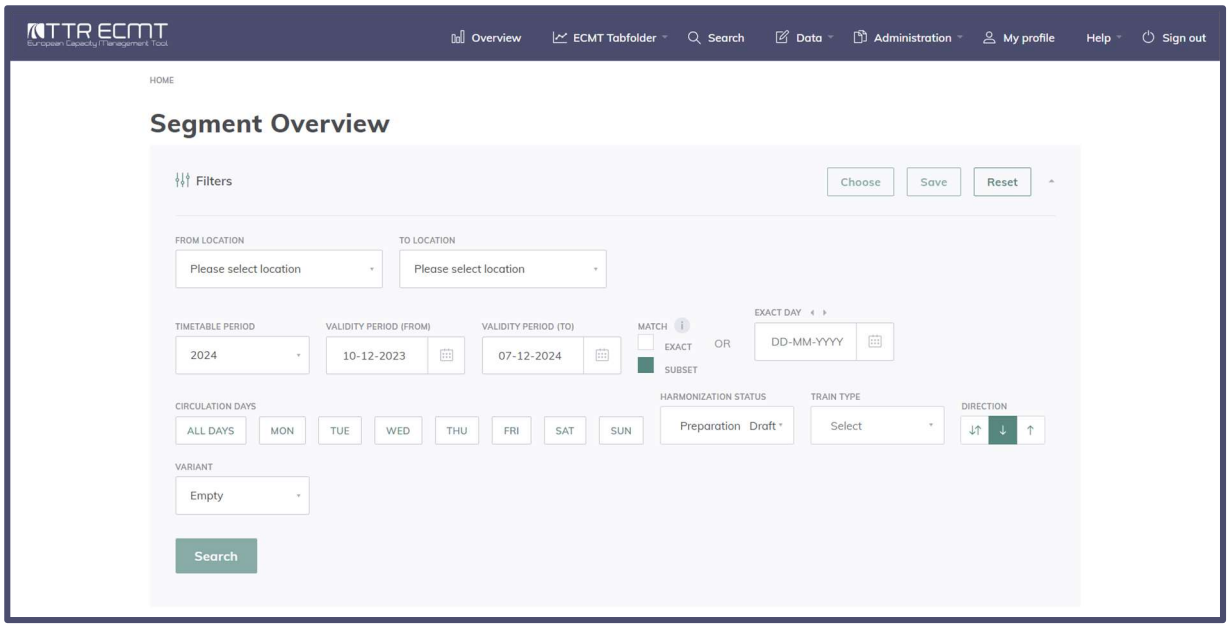
According to the example below, this section of track can handle one Annual Time Table (ATT) domestic freight capacity, two international ATT freight capacities, and three international ATT passenger capacities during the 08:00 hour.



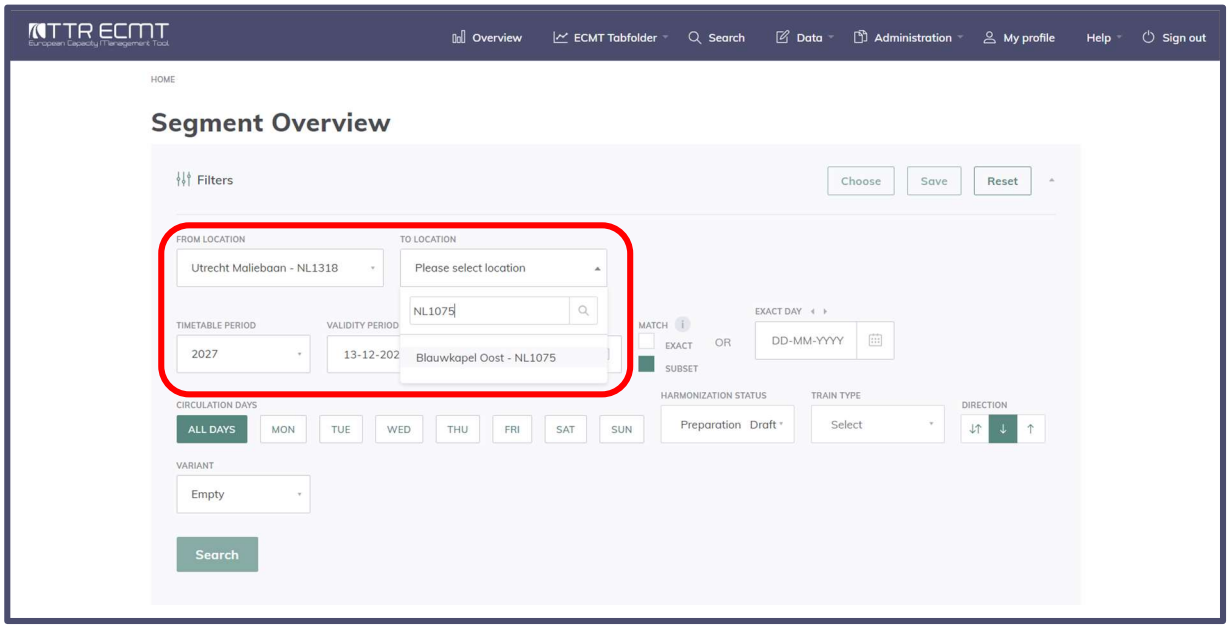
2.2.1.1 Accessing and Generating the Capacity Model Segment Overview

A segment is a stretch of track between two neighbouring primary location codes (PLCs). The PLCs included in a segment must be direct neighbours, meaning there cannot be any intermediate PLCs on a segment.

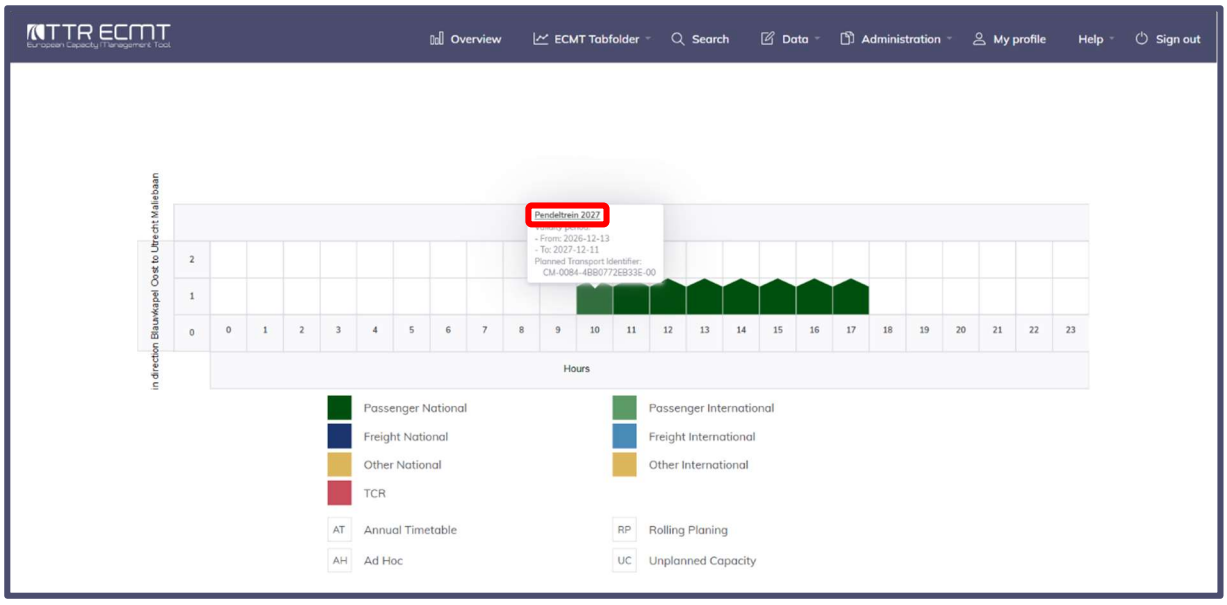
Upon selecting 'Segment Overview' from the 'ECMT Tabfolder' dropdown, the user will find the Segment Overview landing page. Here, the user can set the parameters in order to view the desired section of the railway network.



Once the user has selected the first PLC under the field 'From Location', they will only be allowed to select a PLC under 'To Location' which neighbours the PLC which has been specified in 'To Location'.



Once the user has filled in the desired filters, they should select 'Search' to view the Capacity Model Segment Overview. This will generate the Capacity Model Segment Overview for the selected section. Here the user can visualise the planned capacity situation and select the individual CMOs to view their details page.



2.2.1.2 Objects of the Segment Overview

There are three objects which could appear on the segment overview: Capacity Model Objects, Temporary Capacity Restrictions, and Intended Capacity Lines (ICL).

Capacity Model Objects

There are several categories of CMO which can appear on the segment overview, the category of CMO is determined by the Capacity Product Type, Category, and Train Type.

Capacity Product Type	Annual TT (ATT), Rolling Planning (RP), Ad-hoc (AH), or Unplanned
Category	National or International
Train Type	Freight, Passenger, or Other

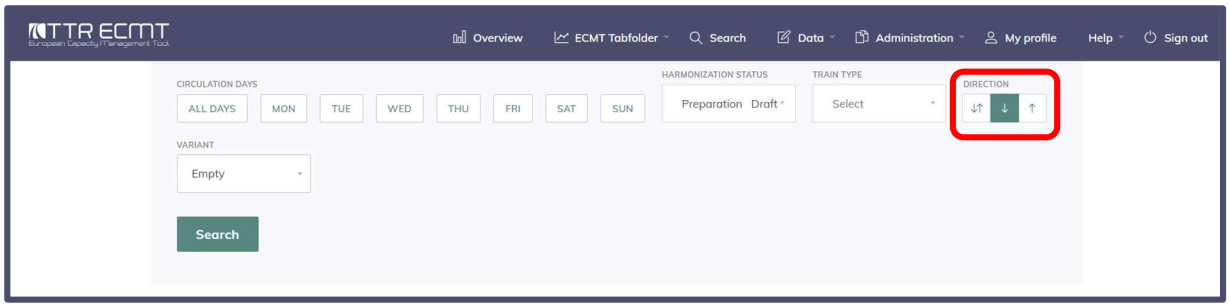
The company and rights of who has generated the Segment Overview and the harmonisation status of a given CMO (Preparation, Draft, Published final, or Closed) can affect what CMOs are shown in the overview, and can also affect whether the user is able to access the details page of a CMO.

CMOs which hold the 'Published Final' or 'Closed' Status will be visible and their details page will be accessible to all IM and RU users who are able to generate a Segment Overview.

CMOs which hold the 'Draft' status will also be shown to all users who are able to generate a Segment Overview, however, Applicant users and anonymous users will not be able to access the details view of such CMOs.

CMOs which hold the 'preparation' status will only be visible and have the details page accessible to users of the company to which the CMO belongs.

When generating the Segment Overview, the field 'Direction' defaults to the downward arrow, this means the Segment Overview will generate based on the specified origin and destination point. Selecting the Upward arrow will swap the origin and destination, and the Segment Overview will display CMOs in the opposing direction. Selecting the option with the upwards and downwards arrow together will display CMOs in both directions between the two selected PLCs.



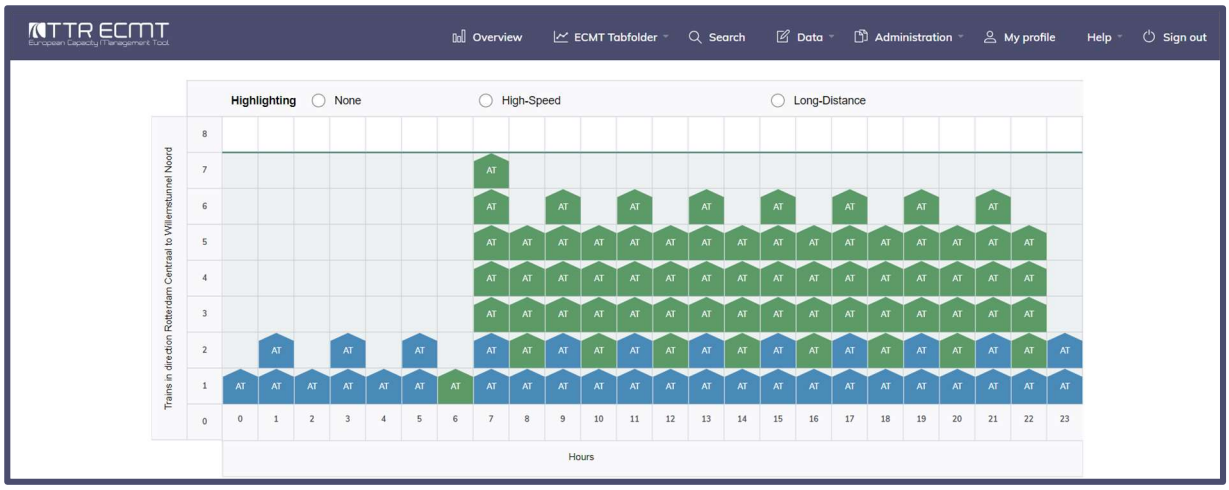
When both directions are selected, the direction of each CMO can be determined by orientation of the CMOs arrow. In the following visual, CMOs with downward facing arrows travel in the direction Singelgrachtburg > Amsterdam Centraal, while CMOs with upward facing arrows travel in the direction Amsterdam Centraal > Singelgrachtburg

Intended Capacity Lines (ICL)

The Intended Capacity Line is the theoretical maximum number of volumes which a section or line of a railway network can handle without causing a serious impact on the timetable. The ICL is set by the Infrastructure Manager either directly in ECMT or via Excel import, see section 3.1.1 for information on creating an ICL. The ICL is represented as a horizontal line on the Segment Overview and can vary from one hour to the next, or remain the same for every hour of the day.

In the following visual, the ICL is set to 7. This means, according to ECMT and as determined by the IM, the capacity of the selected segment is 7 capacities per hour for 24 hours. In this example, there is no hour of the day in which the line is over capacity.

It is possible in ECMT for the number of capacities (CMOs) to exceed the ICL, this is the case in the previous visual.

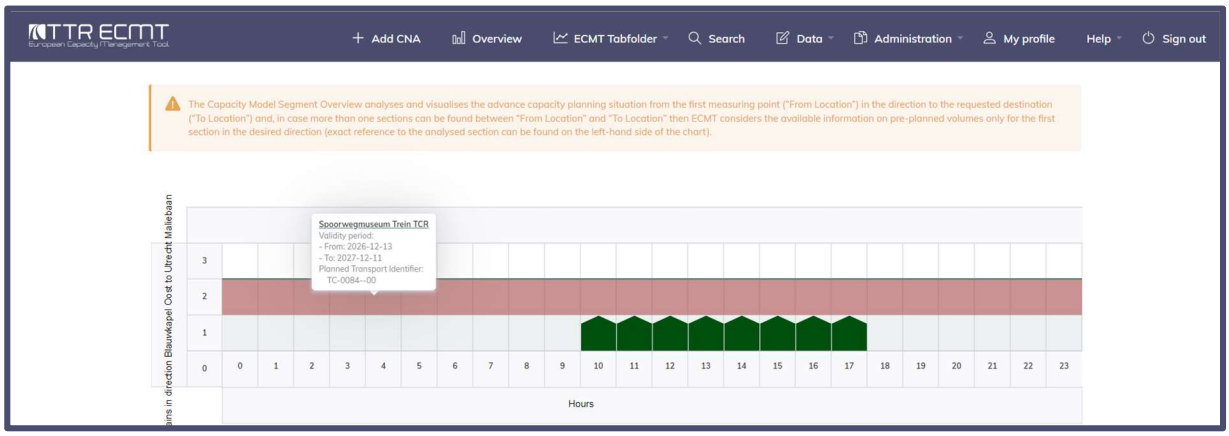


Temporary Capacity Restrictions

Temporary Capacity Restrictions are an object which exist in ECMT that are created by IM users. TCRs can be imported via Excel. TCRs represent a temporary lowering of number of capacities which a section of the railway network can accommodate. TCRs are visualised in the Segment Overview as red coloured overlays on top of the other content of the Segment Overview.

In the following visual, there is a TCR which results in a 50% reduction in the lines capacity. Given that the ICL is set to two capacities per hour, the red TCR representation fills up only one hour (half of the available capacity).

If there is no ICL present on the selected segment, any TCRs which exists on that segment will not appear in the Segment Overview



The user can click over the TCR to bring up a tool tip with further information about the object, the user can also click on the title to bring up the object's details page.

TCRs can have two forms of temporal expansion, these are **continuous** and **periodical**.

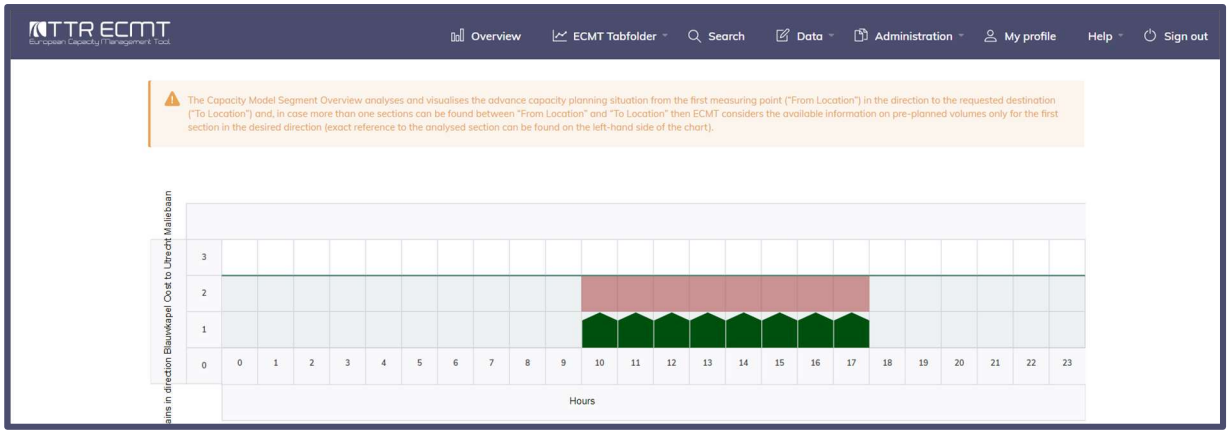
Continuous TCRs

Continuous TCRs are defined by a start and end date and by a start and end time. The start time occurs once on the start date of the TCR, and the end time occurs once on the TCR's end date. On the segment overview, continuous TCRs will appear during every hour of the day, unless the segment overview has

been set to either the TCR's start or end date, in which case the TCR will only be shown from the start time or to the end time. The above visual shows a continuous TCR.

Periodical TCRs

Periodical TCRs are defined by a start and end date and a start and end time, however unlike continuous TCRs, the start and end time apply to each individual day which the TCR is valid. In the following visual, The TCR has a validity period of the entire timetable year, but only between 10:00 and 17:00 on each day.



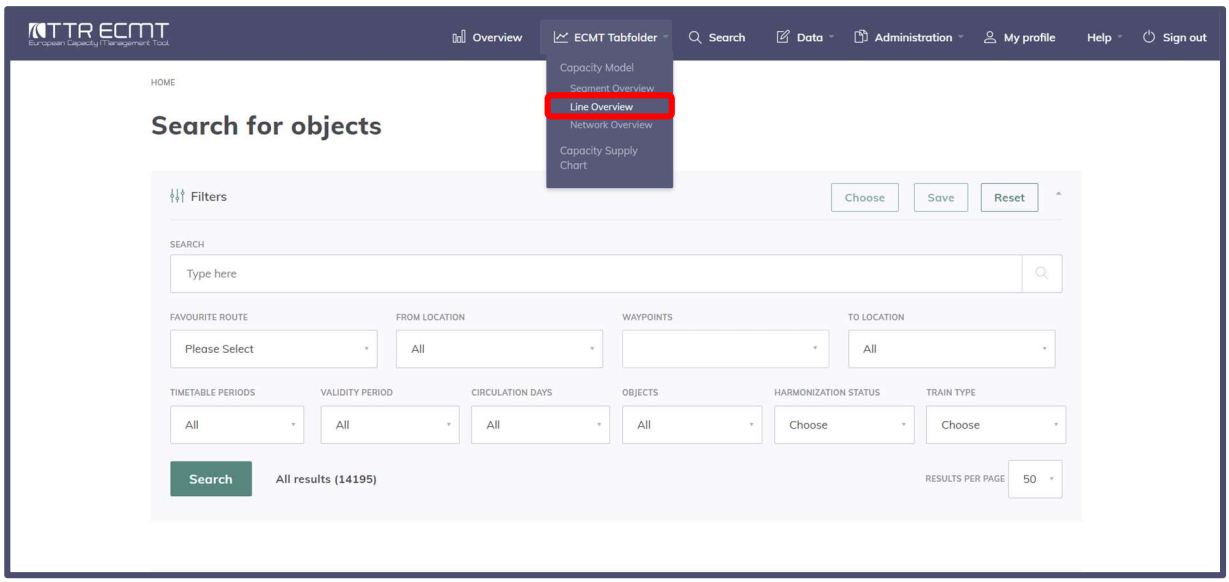
2.1.1 Line Overview

The Capacity Model Line Overview provides a visualisation of Capacity Model Objects, ICLs, and TCRs between any two PLCs. The X axis consists of all PLCs on the selected route, and the Y axis consists of each hour of the day. Capacity Model Objects are represented as rectangles which appear within the hour corresponding to their set times, and between the PLCs according to their route.

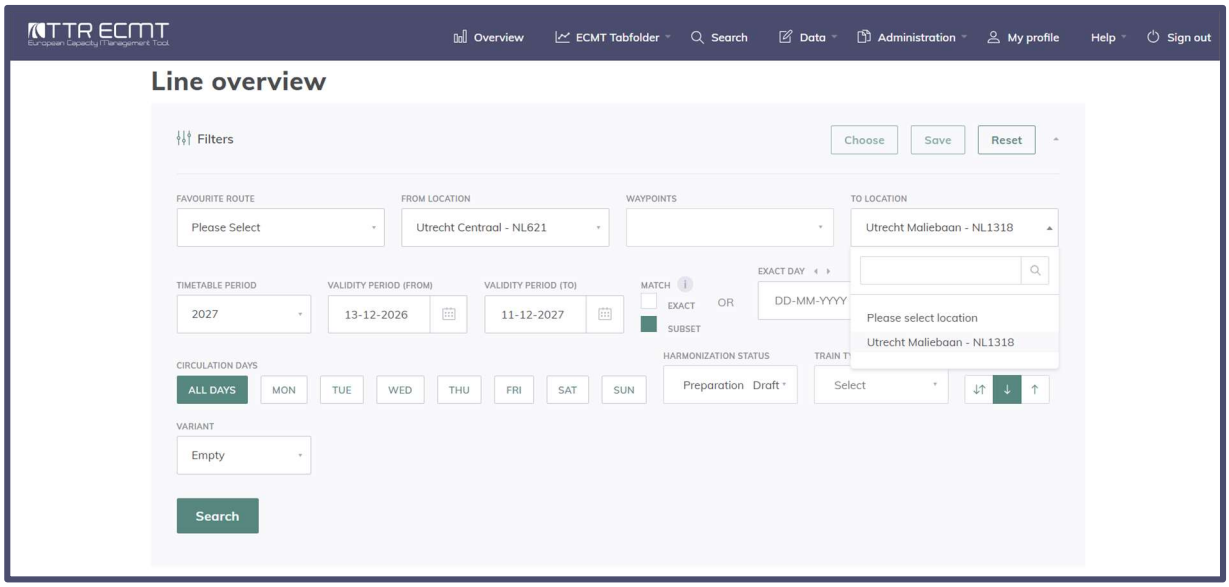
When an ICL is present on a given line or segment, TCRs will be represented as red rectangles and be present within each hour of the day according to the TCR's duration.

2.1.1.1 Accessing and Generating the Capacity Model Line Overview

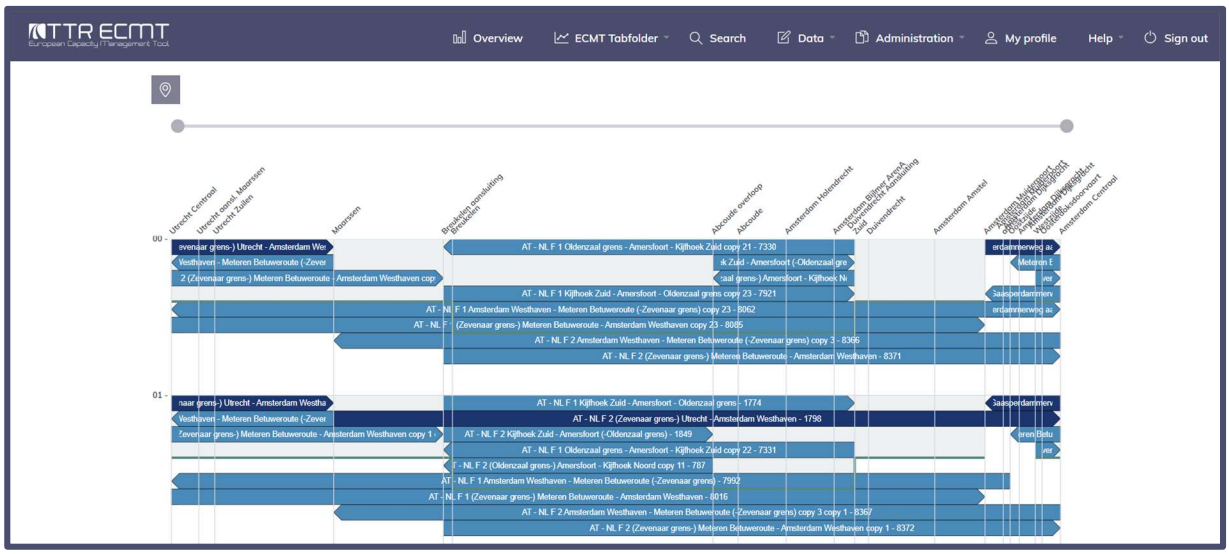
To access the Line Overview, the user can select 'Line Overview' from the 'ECMT Tabfolder' drop down menu:



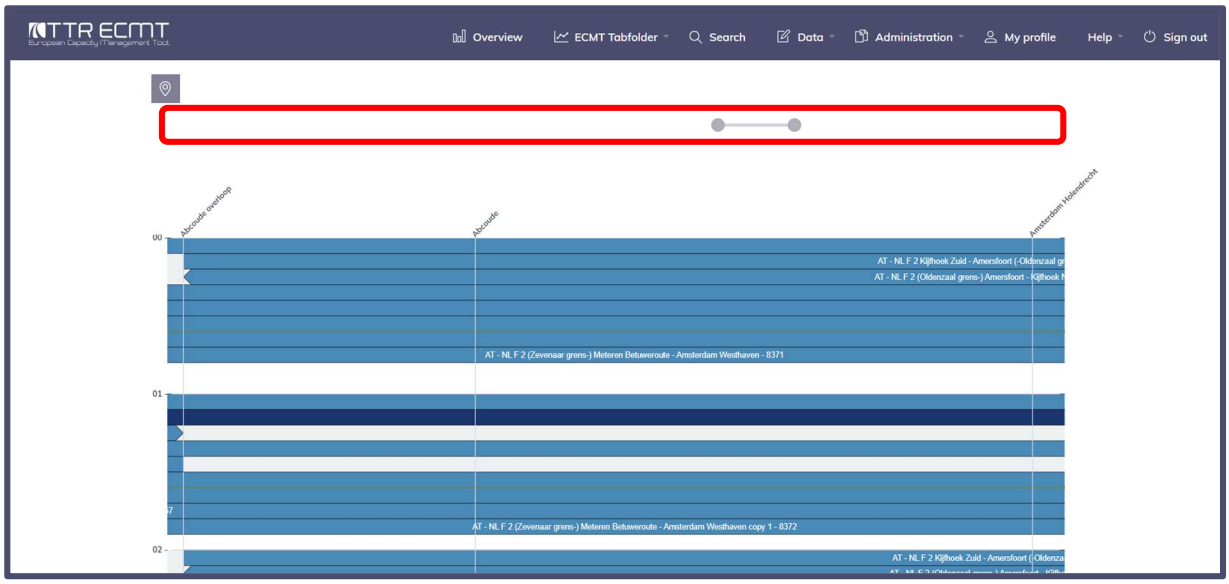
Selecting ‘Line Overview’ brings the user to the Line Overview landing page. Here, the user can set the desired parameters for viewing the overview. Unlike the Segment Overview, the user can select a route with any two PLCs as the origin and destination. Selecting ‘Search’ generates the Line Overview.



Once the user has generated the Line Overview, they will see objects which exist between the origin and destination, including those which exist only for certain segments or shorter lines within the origin and destination.



Depending on the distance between the selected origin and destination PLCs and the line in question, the Line Overview can become highly populated. In these cases, or when the user wishes to understand the planned capacity situation on a smaller area of the overview without re-defining the search, the user can click and drag the grey dots above the overview until only the desired portion is shown:



2.2.2.2 Objects of the Line Overview

As with the Segment Overview, the Line Overview displays Capacity Model Objects, TCRs, and ICLs.

Capacity Model Objects

There are several categories of CMO which can appear on the Line Overview, the category of CMO is determined by the Capacity Product Type, Category, and Train Type.

Capacity Product Type	Annual TT (ATT), Rolling Planning (RP), Ad-hoc (AH), or Unplanned
Category	National or International
Train Type	Freight, Passenger, or Other

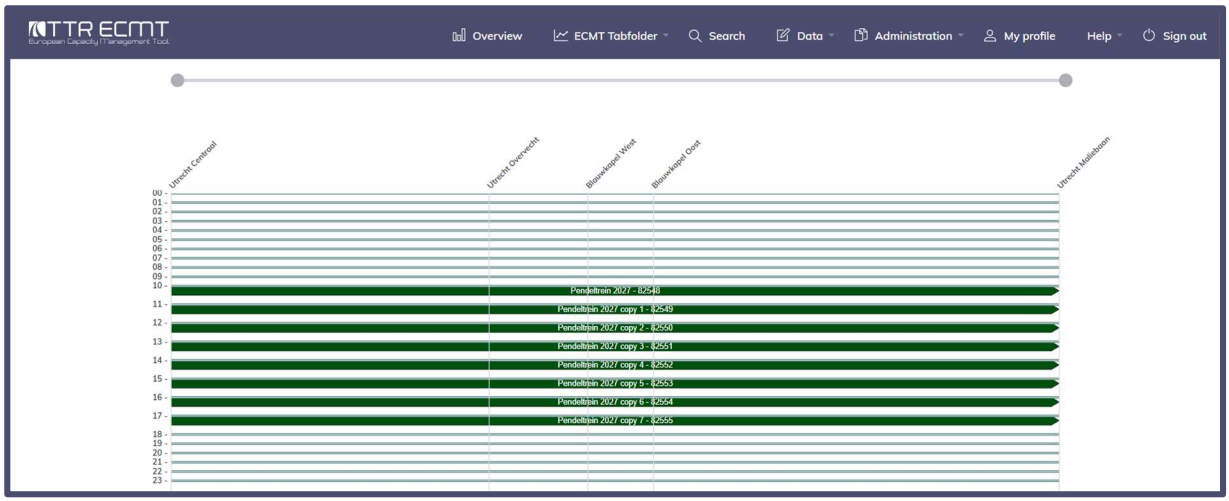
The company and rights of the user who has generated the Line Overview and the harmonisation status of a given CMO (Preparation, Draft, Published final, or Closed) can affect what CMOs are shown, and can also affect weather the user is able to access the details page of a CMO.

CMOs which hold the 'Published Final' or 'Closed' Status will be visible and their details page will be accessible to all IM and RU users who are able to generate a Line Overview.

CMOs which hold the 'Draft' status will also be shown to all users who are able to generate a Line Overview, however, Applicant users and anonymous users will not be able to access the details view of such CMOs.

CMOs which hold the 'preparation' status will only be visible and have the details page accessible to users of the company to which the CMO belongs.

In the following visual, the CMOs are represented in green, and exist on the entre route which has been selected. This train runs once an hour between 10:00 and 17:00, and thus appears within each of those hours. Users can click on the CMO to view the details page in another tab (if they have the right to access the details page).



Temporary Capacity Restrictions

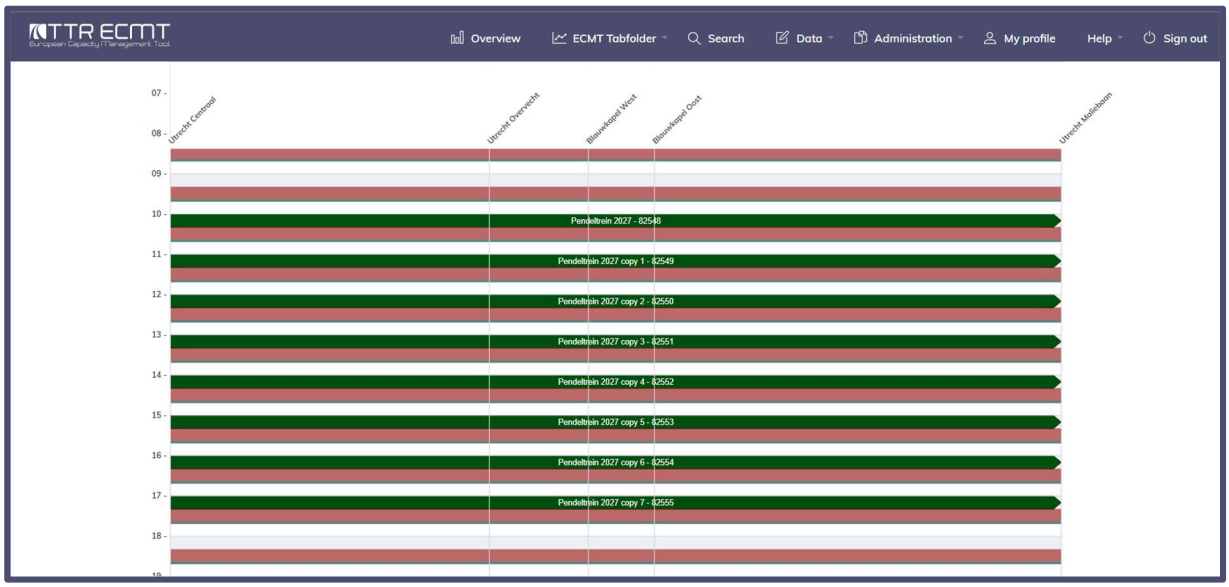
In the following visual, the TCR is shown in red. This TCR exists between *Utrecht Centraal* and *Utrecht Maliebaan*, and thus is only shown between those two PLCs. Users can click on the TCR to view the details page in another tab (if they have the right to access the details page).

As with the Segment Overview, there must be an ICL set in order for the system to display TCRs on the Line Overview.

TCRs can have two forms of temporal expansion: **continuous** and **periodical**.

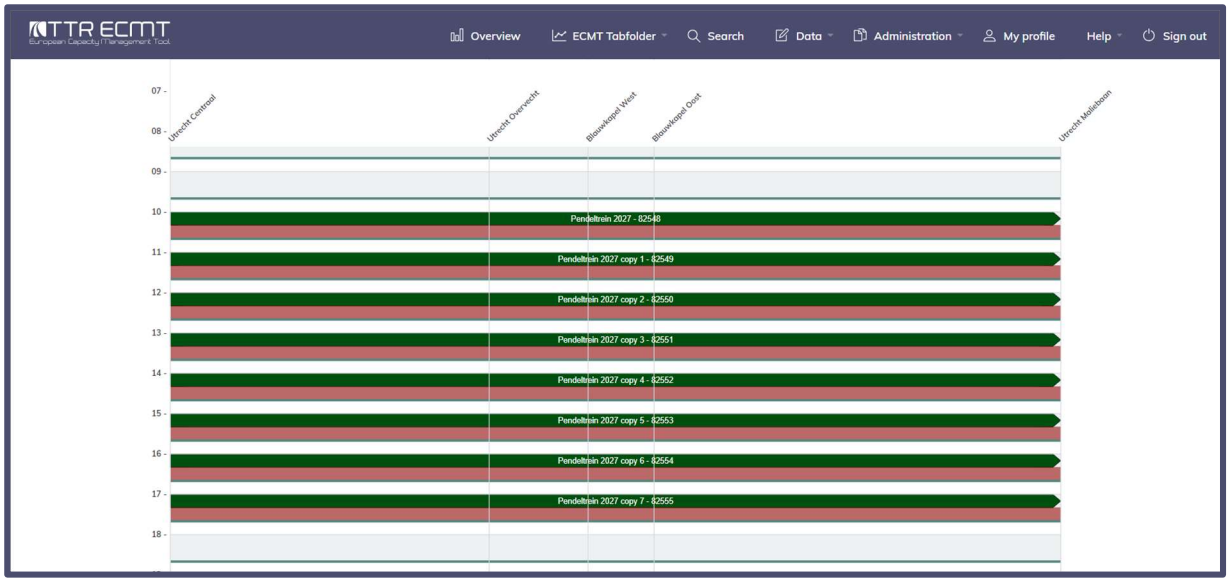
Continuous TCRs

Continuous TCRs are defined by a start/end date and by a start/end time. The start time occurs once on the start date of the TCR, and the end time occurs once on the TCR's end date. On the segment overview, continuous TCRs will appear during every hour of the day, unless the line overview has been set to either the TCR's start or end date, in which case the TCR will only be shown from the start time or to the end time. In the following visual the TCR has a start and end time of 10:00 and 17:00 respectively, and a validity period of the entire timetable year, thus in the line overview there the TCR is shown in every hour of the day.



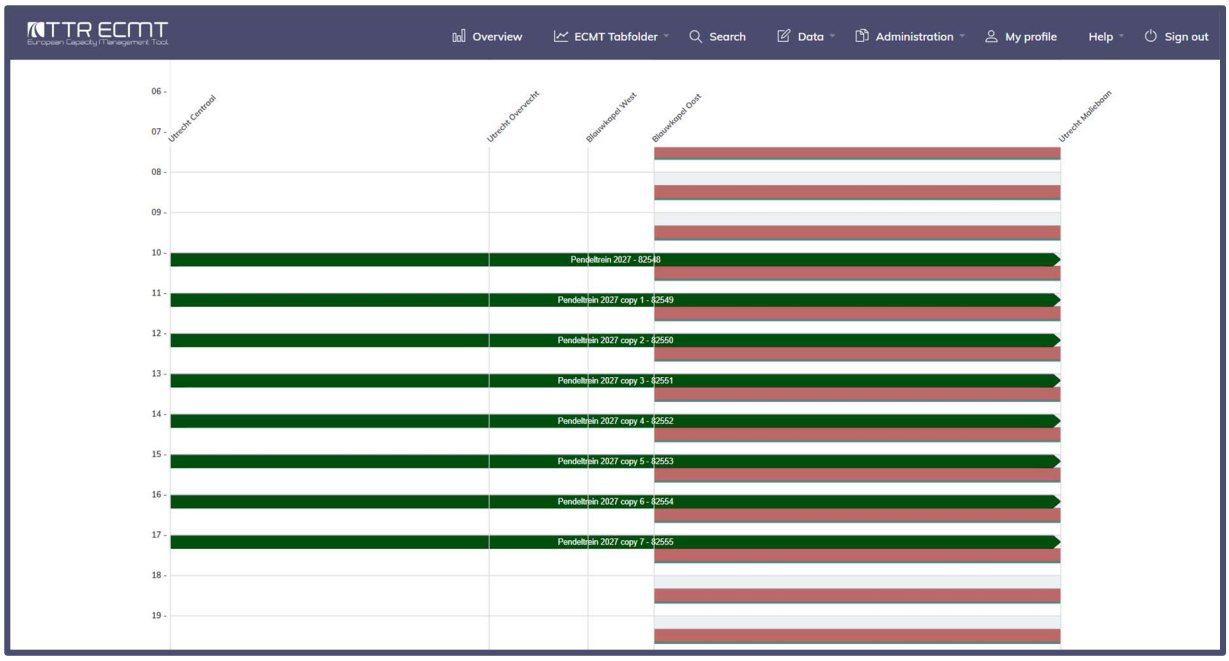
Periodical TCRs

Periodical TCRs are defined by a start and end date and a start and end time, however unlike continuous TCRs, the start and end time apply to each individual day which the TCR is valid. In the following visual, The TCR has a validity period of the entire timetable year, but only between 10:00 and 17:00 on each day, thus on any day selected for the line overview, the TCR will be shown only between those times.



Intended Capacity Lines (ICL)

In the following visual, the Infrastructure Manager has set an ICL of two capacities per hour between *Blauwkapel Oost* and *Utrecht Maliebaan*. The ICL is represented as a green line within each hour of the day, above which the white space within the hour is tinted green. The green-tinted area indicates the space within the ICL. In this example, both the TCR and the CMO fit within the ICL. TCRs will always appear within the ICL, as they are calculated as a percentage thereof. Positive capacity (CMOs) which exceed the ICL will appear outside the of the ICL line.



2.2.3 Network Overview

The Network Overview provides a map-based, high level representation of the capacity situation anywhere on the European rail network and within any given date and time range. The capacity situation is an indication of the level of congestion on any given portion of the railway network and is determined by the amount of CMOs in relation to a line's TCRs and ICL.

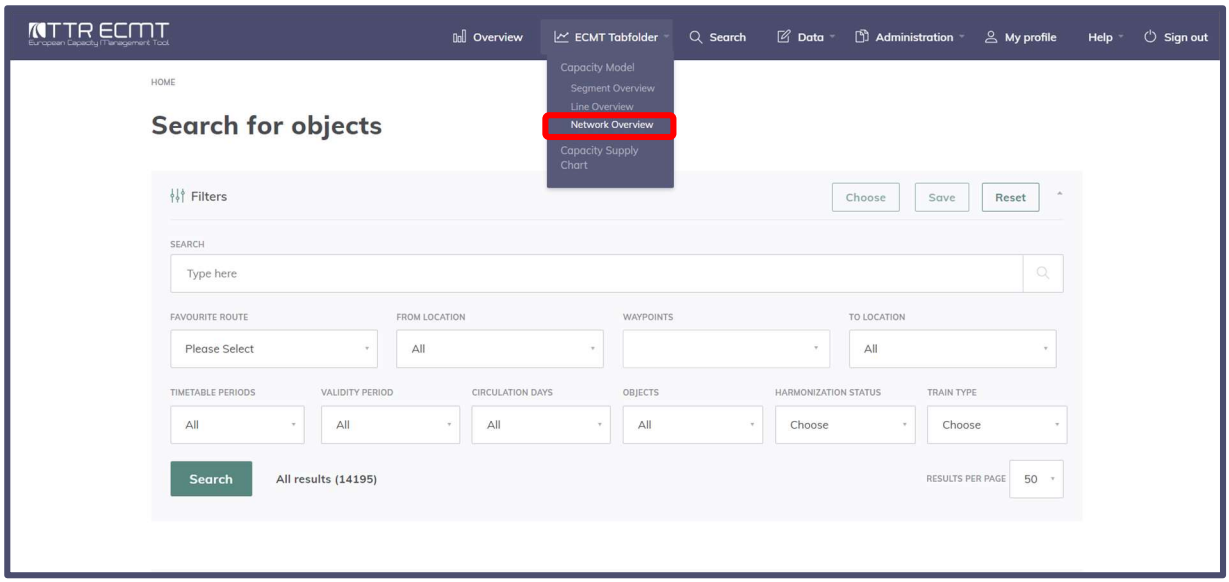
Congestion is indicated on the Network Overview via three possible colours which overlay on top of the regular grey coloured railway lines.

Colour	Meaning	Calculation
Green	Capacity Surplus	# of objects < ICL
Orange	Sufficient Capacity	# of objects = ICL
Red	Possible Capacity Shortage	# of objects > ICL
Grey	Usual route (no ICL)	-

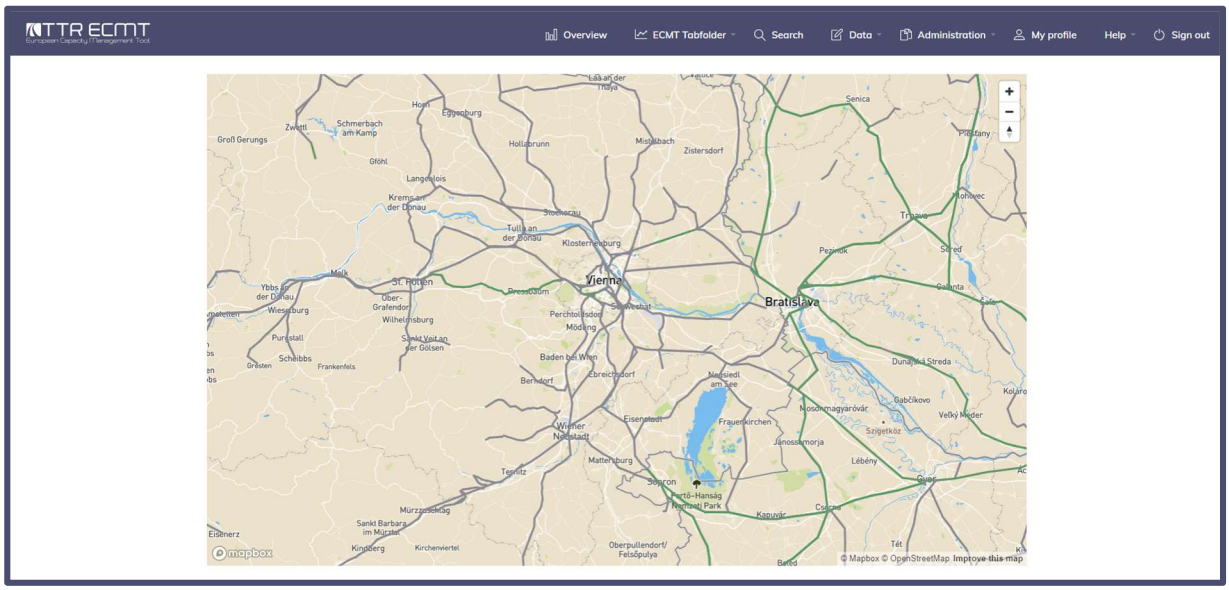
All users, including anonymous users, can access the network overview.

2.2.2.1 Accessing and Generating the Network Overview

In order to access the Network Overview, the user should select 'Network Overview' from the 'ECMT Tabfolder' dropdown menu.



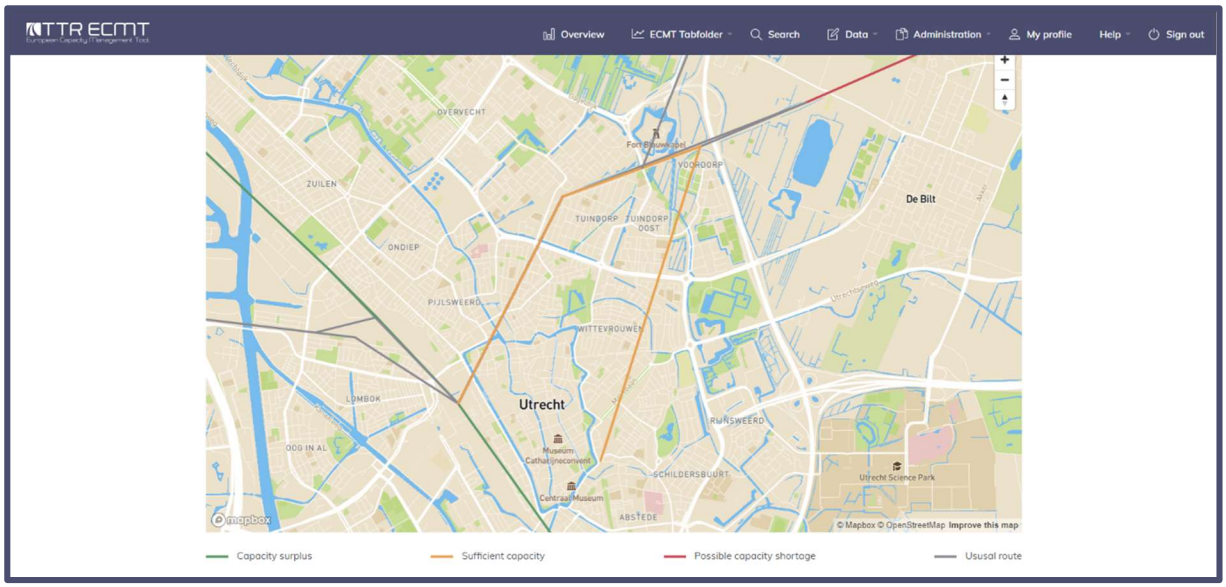
This action loads the Network Overview. The map will always load centred above Vienna, Austria, and be set to the date on which the user generated the overview.



Above the map on this page, there are three filters which the user can input the yield the desired data: 'Calendar', 'Hours From - To', and 'Location Search'.

Calendar	The exact date from which Capacity Model data will be used to colour the Network Overview
Hours From - To	The exact times during the selected date from which to colour the Network Overview.
Location Search	The user can search for any PLC, selecting a location from the dropdown will recentre the map above that PLC

In the following visual between *Utrecht Centraal* and *Utrecht Maliebaan*, the ICL is set to two capacities per hour. A TCR with 50% affected Travel Volume occupies one of those capacities per hour, and a CMO between these two locations once per hour occupies the other capacity. Given that the combination of positive and negative capacity is equal to the ICL, the line appears as yellow.

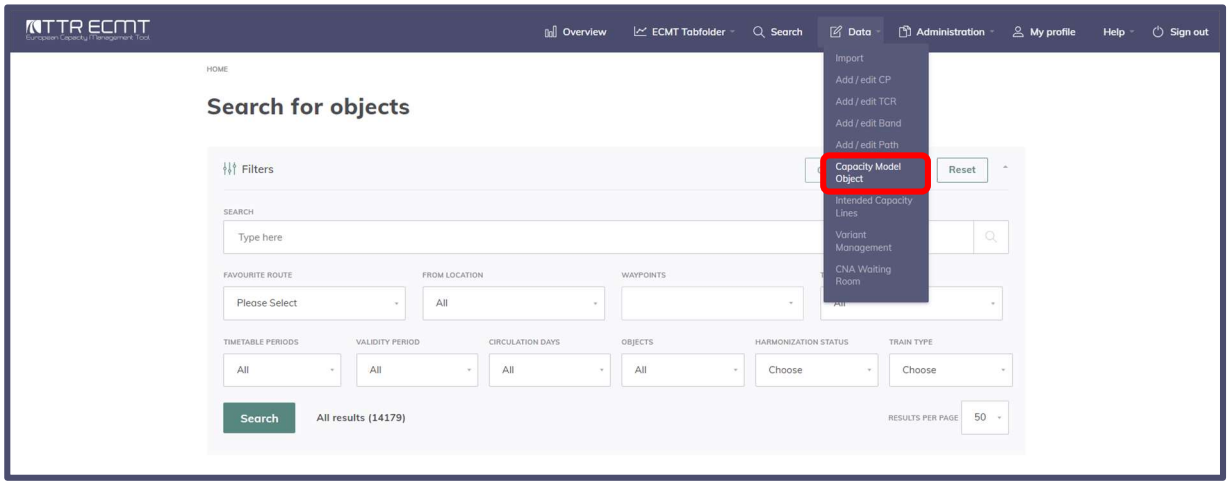


2.3 CMO Harmonisation

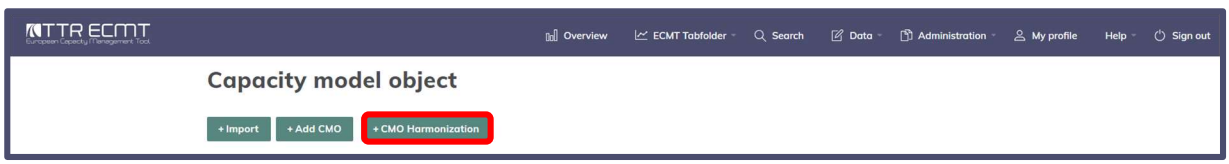
Capacity Model Objects can only be created between PLCs within the IM user's companies' territory, in other words, there is no such thing as a cross-border CMO. In order for IM users to use CMOs as a tool for cross-border capacity planning, such users need to be able to align their CMOs with one another at their respective border points. ECMT facilitates this through the CMO Harmonisation functionality. With this functionality, users can identify CMOs which need to be harmonised and subsequently match their timing to avoid discrepancies at border points.

2.3.1 Accessing CMO Harmonisation

To access the CMO Harmonisation page, users should select 'Capacity Model Object' from the 'Data' drop down menu.



Here, the user should select '+ CMO Harmonisation':

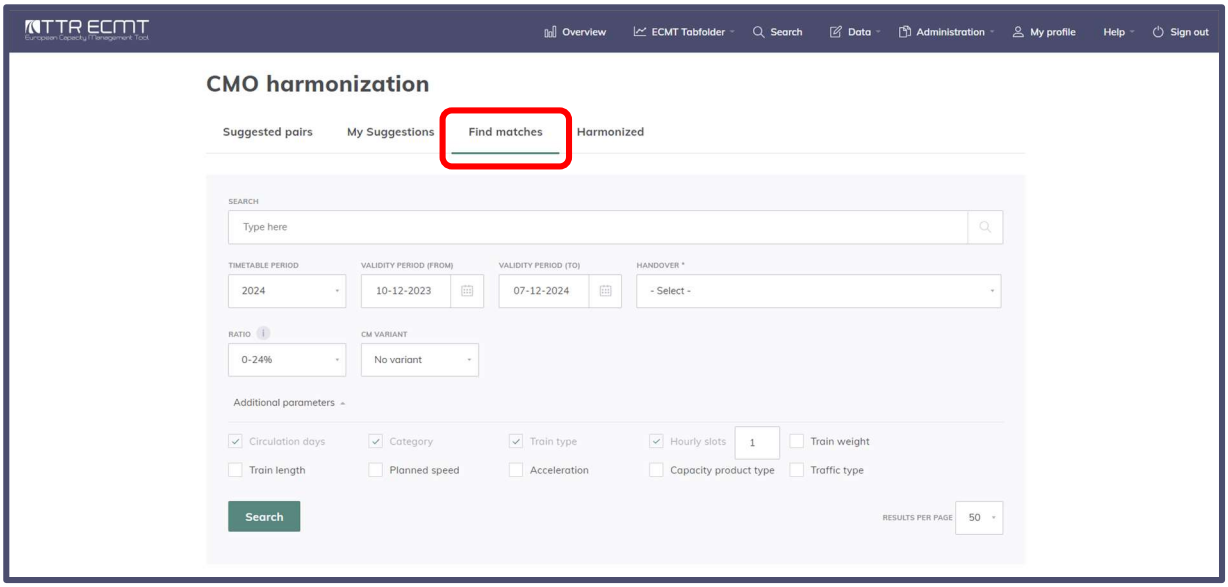


This brings the user to the CMO Harmonisation main page. There are four tabs in the CMO Harmonisation main page to choose from:

Suggested pairs	Displays the user's CMOs which users from neighbouring IMs have suggested as matching one of their own
My suggestions	Displays the CMO pairs which have been identified by the user
Find Matches	Where the user can search for potential matches with neighbouring IM user's CMOs
Harmonised	Displays pairs of CMOs belonging to the user which have already been harmonised with a neighbouring CMO

2.3.2 CMO Harmonisation Workflow

To begin the CMO Harmonisation workflow, the user should select the 'find matches' tab:



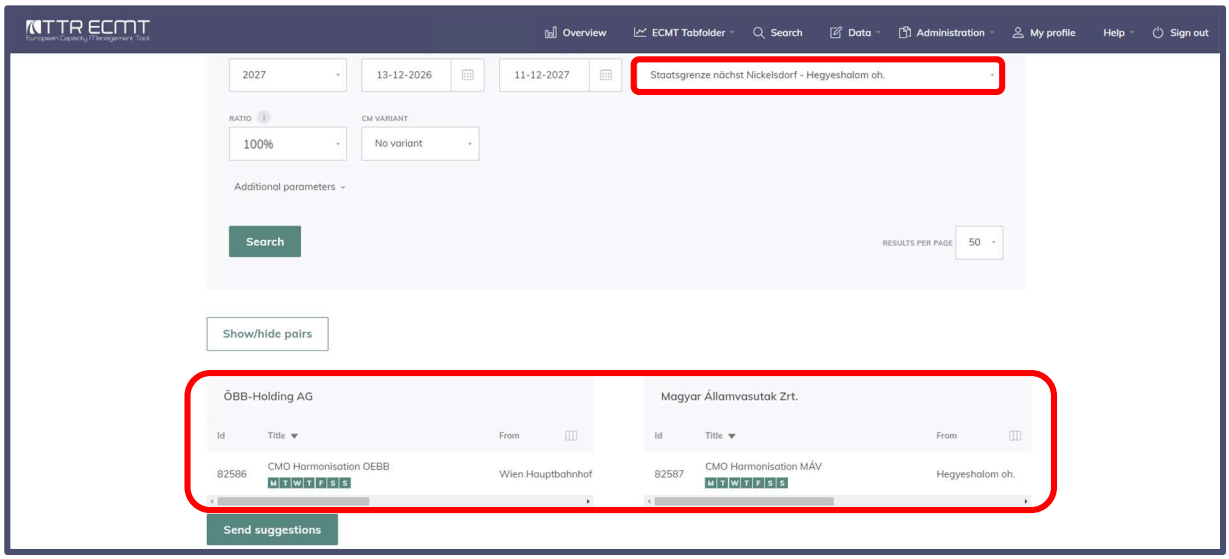
The user should then define the parameters by which they will search for matches. The fields for conducting this search are as follows (note that the only mandatory field is the handover point):

Search	Search based on the title of the CMO which the user would like to harmonise
Timetable period	The timetable period to which the CMOs belong that will be shown to the user
Validity Period (From)	Can further narrow the search compared to timetable period
Validity Period (To)	Can further narrow the search compared to timetable period
Handover*	Dropdown list displaying all **segments** which contain one PLC owned by the user's company and one PLC owned by another company. Selecting a handover displays all CMOs which include either of said PLCs
Ratio	A dropdown which allows the user to choose the percentage of common running days to be highlighted by the tool. This filter will only affect the Colour indication when visualising potential matching CMOs. This filter will not affect the actual results of the search.
CM Variant	A timetable variant can be set by the IM, this represents a period in which alternative parameters can apply to a CMO.

Additional Parameters
Circulation days
Category
Train type
Hourly slots
Train weight
Train length
Planned speed
Acceleration
Capacity product type
Traffic type

Once the user has selected the border point at which they would like to harmonise and put in any other desired fields, they can select 'search' to view potential matching CMOs.

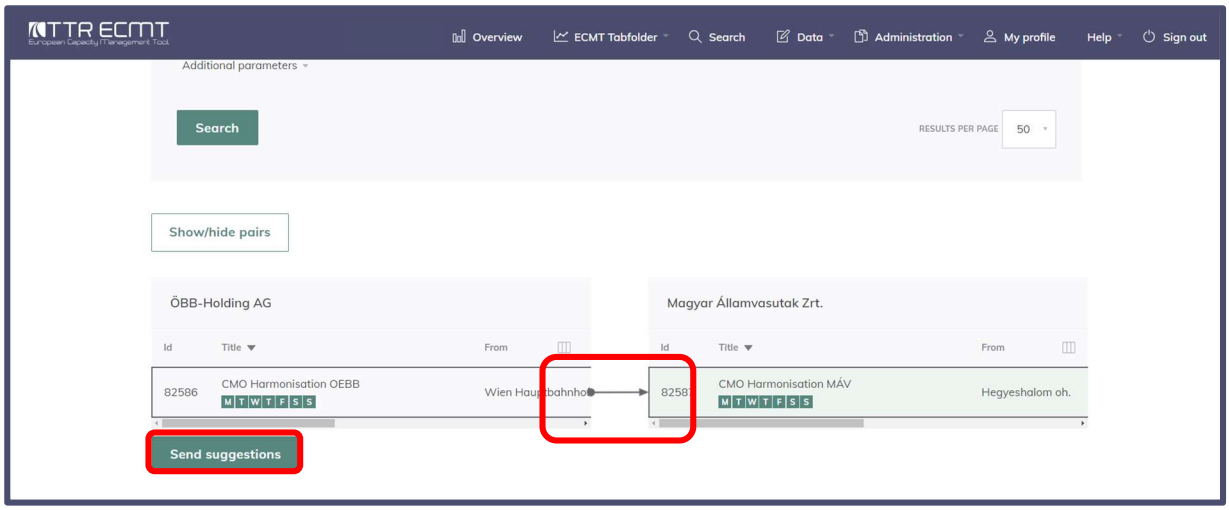
In this following visual, the user belongs to ÖBB-Holding, has selected the border point *Staatsgrenze nächst Nickelsdorf – Hegyeshalom oh*. This means the user will see matching CMOs from the Hungarian Infrastructure Manager MÀV Zrt.

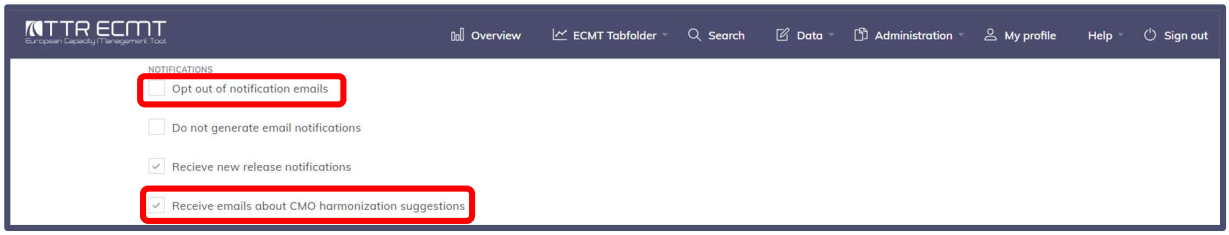


Once the user has generated the list, they can click on CMOs of the neighbouring IM. Selecting one such CMO will cause an arrow to appear between the CMO from the user's side which matches the best.

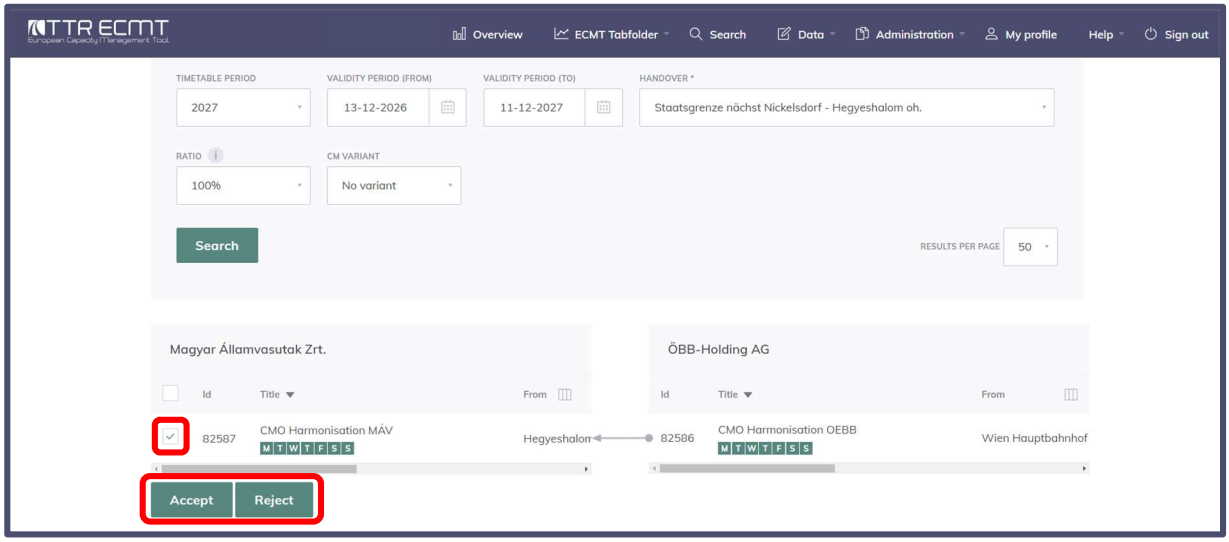
In the following example there is only one CMO per IM at this border point - the matching arrow will be especially helpful to the user where there are many CMOs on either side of the border. Once the user has determined that the suggested match is indeed the most ideal, the user should select 'Send Suggestions'. This will cause the selected match to appear in the users of the neighbouring IM's 'Suggested pairs' tab, as well as the user's 'My Suggestions' tab. Additionally, the user who created the neighbouring CMO will receive an email with a link to the suggested pair.

It is important to note that the neighbouring user will only receive this email if they have selected the check box 'Receive emails about CMO harmonisation suggestions' and if the user who made the suggestion is has not selected the check box 'Opt out of notification emails' These options can be accessed via the 'My Profile' tab and then selecting 'Edit'.





In the following visual, the user is an employee of Magyar Államvasutak Zrt. The pair of CMOs which was suggested above by the ÖBB-Holding user will now show up in the MÁV user's 'Suggested Pairs' tab when they have filtered for the specific timetable year and border location. The user has the ability to click on the title of both CMOs to examine their details, and, once the user has selected the checkbox located within their CMO's information box, they can either select 'Accept' or 'Reject'



3 Capacity Needs Announcements (CNA)

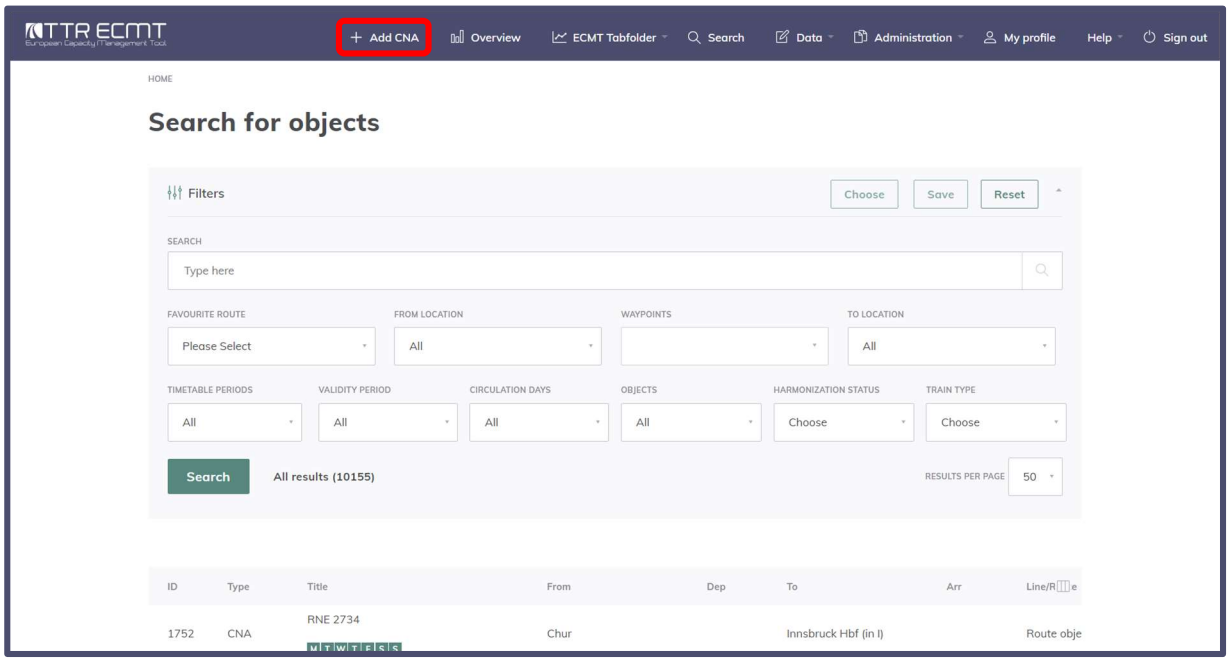
Capacity Needs Announcements constitute the market input to the Advanced Planning phase of the Timetable Redesign (TTR) process. CNAs are submissions made by applicants and their partners towards Infrastructure managers which indicate trains or general needs for trains that they would like to run in a future timetable. CNAs take a near identical form to Capacity Model Objects, this eases the task for Infrastructure Managers to analyse market needs and translate them into advance capacity plans such as the Capacity Model and Capacity Supply.

3.1 Object Creation

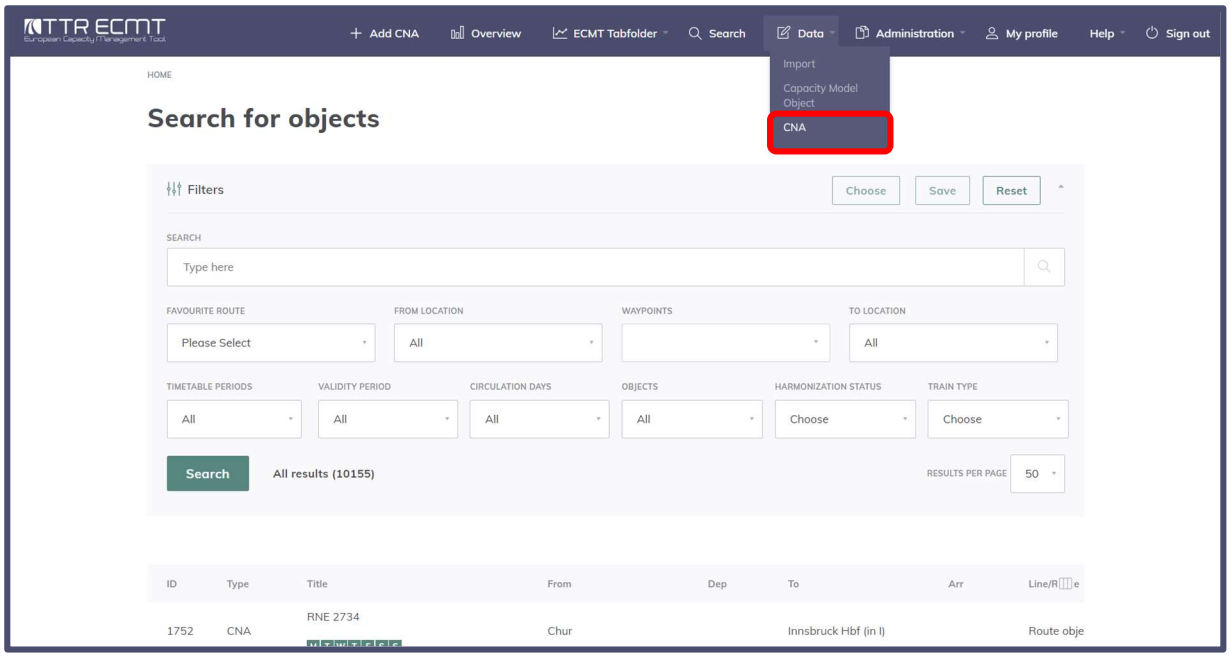
Capacity Needs Announcements can be created by applicants directly in ECMT through the graphical user interface, via Excel import, or through creating frequencies or clones of existing Capacity Needs objects.

3.1.1 CNA Manual Creation

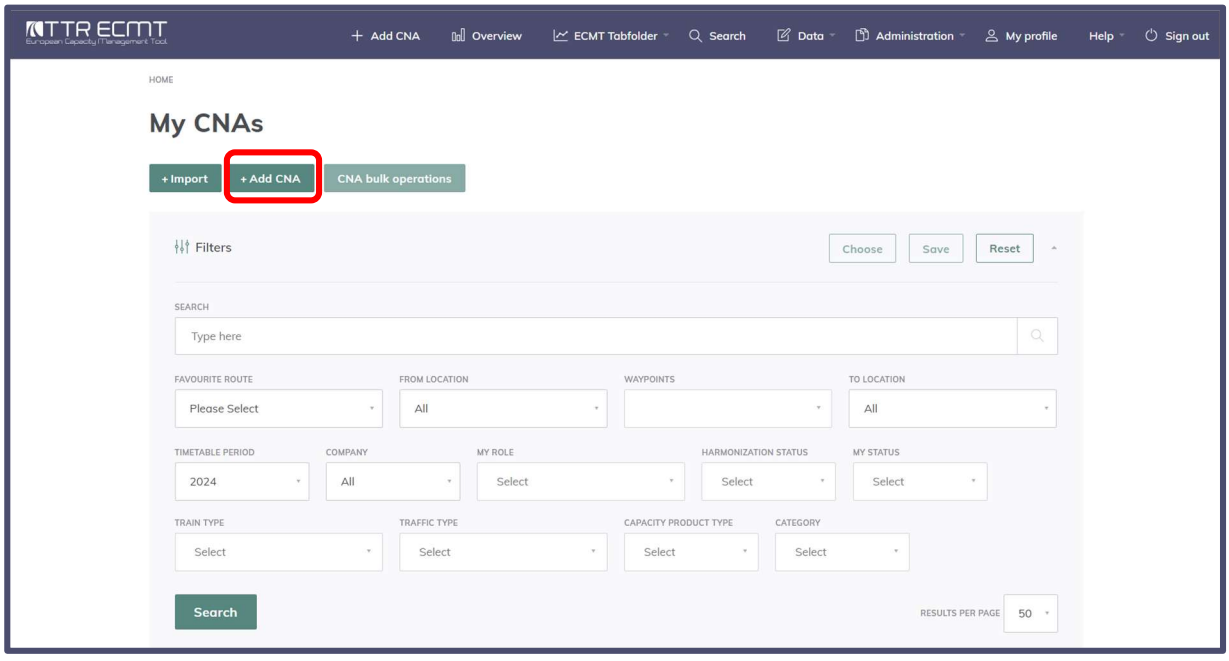
To manually create a CNA through the ECMT graphical user interface, the user can select the '+ Add CNA' button at the top of the screen



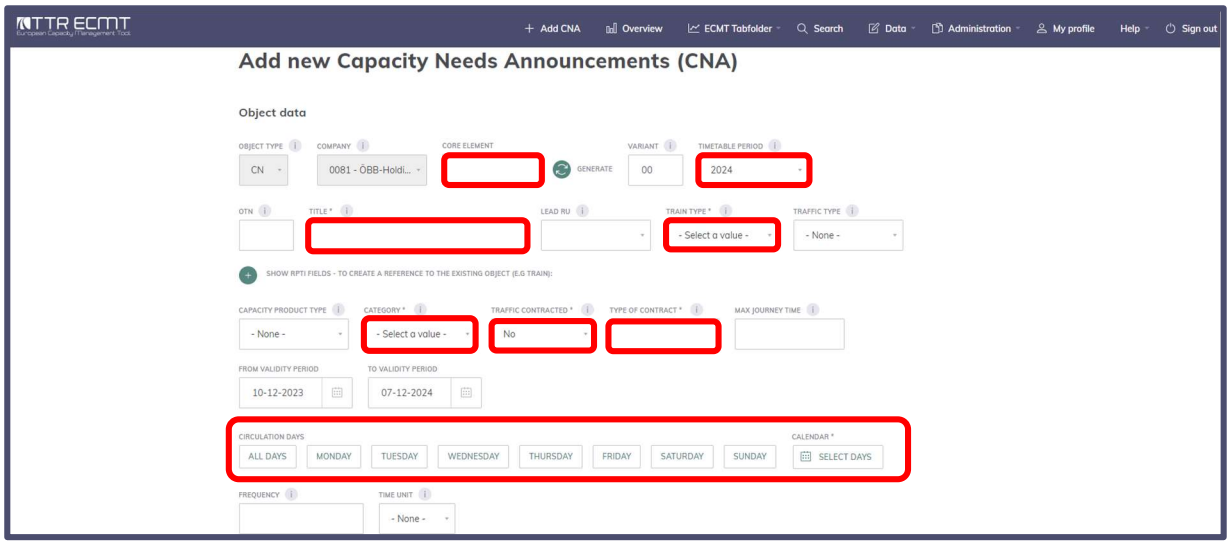
Alternatively, the user can select 'CNA' from the 'Data' dropdown menu

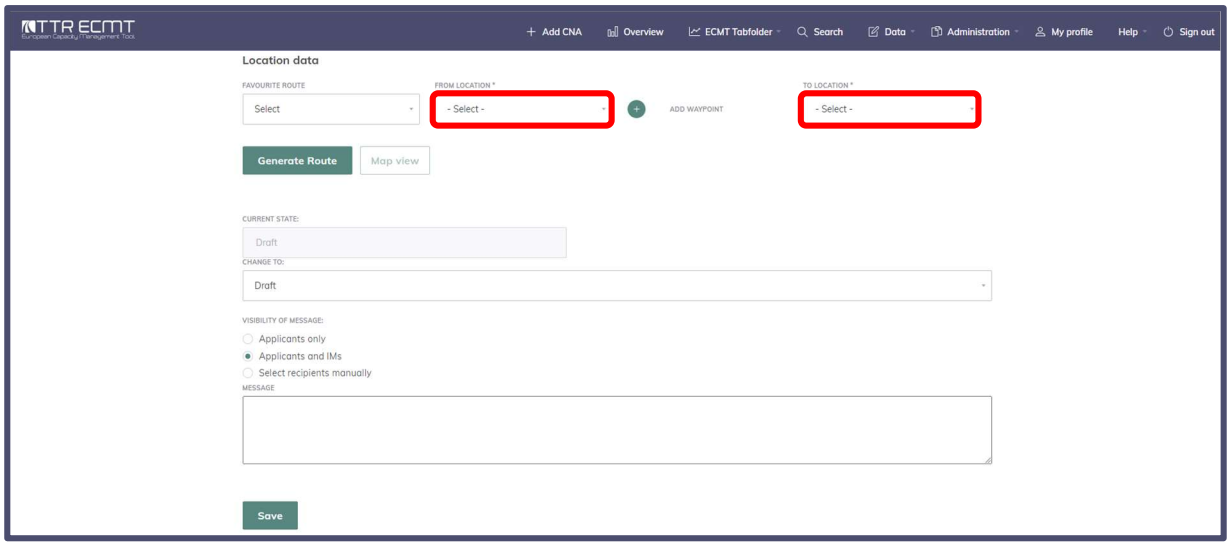


Upon selecting 'CNA' the user will arrive at the CNA landing page, where they can view CNAs, create CNAs, and conduct CNA bulk operations. To manually create a CNA, the user should select '+ Add CNA'



On the create CNA page, the user should input all relevant information for the Capacity Needs Announcement. The mandatory fields are circled in red:

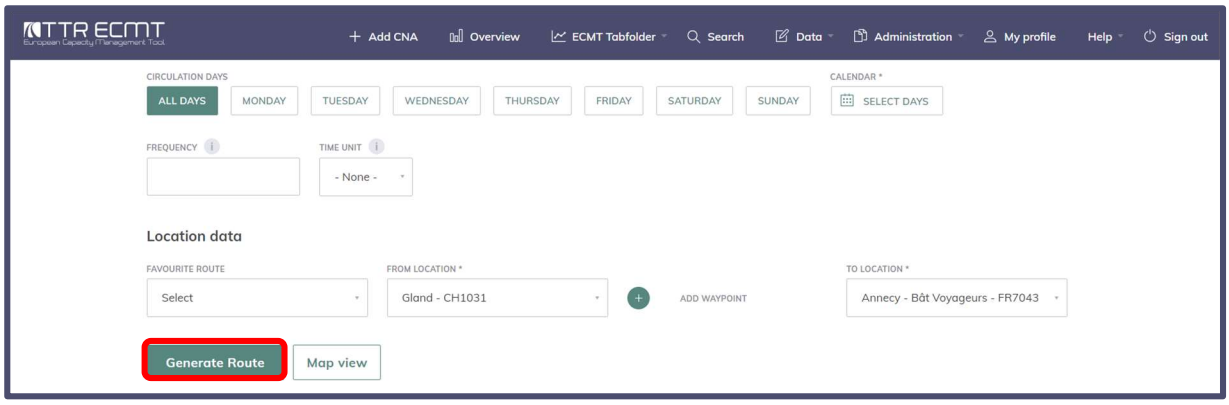




Object Type	Automatically shows 'CN' for Capacity Model Object
Company	Automatically set to the user's company
Core Element*	Unique 12 character alphanumeric identifier for the object, can be manually created or automatically generated
Variant	Not editable when creating a new object, can be used to indicate versioning when creating copies of the object
Timetable Period*	The timetable year to which this CNA will apply
OTN	Operational Train Number
Title*	Title of the object which can be used to easier find the object within the system
Lead RU	Company code for the applicant to state who is the leading applicant of the CNA
Train Type*	Freight, Passenger, or Other
Traffic Type	None, High speed, Long distance, Express regional, or regional
Capacity Product Type	None, Annual TT, Rolling Planning, Ad-hoc, Unplanned

Category*	National or International
Traffic Contracted*	'Yes' in case the traffic is already contracted (e.g. PSO) or the traffic is planned as market (commercial) driven operation (e.g. open access) 'No' if you are not fully sure that your company will be selected to execute the carriage (e.g. ongoing PSO tender)
Type of Contract*	In case you selected 'Yes' in the field TrafficContracted, provide information on the type of contract (e.g. PSO/commercial-driven-operation/supply-driven-operation/demand-driven operation)., In case you selected 'No' in the field TrafficContracted, write down description for IMs for which customer and or what kind of transport will you apply for. This is to allow IMs identify double CNAs for the same transport
Max Journey Time	Maximum desired time between origin and destination (hh:mm)
From Validity Period/ To Validity Period	Automatically fills in the dates of the selected timetable period
Circulation Days/Calendar*	Either circulation days or calendar must be filled in. 'All Days' will select every day of the selected timetable year, selecting any combination of weekdays will cause the CMO to occur on every occurrence of that day(s) throughout the year. For irregular running patterns, the specific days of the year can be chosen from 'Calendar'
Frequency	Indicate the frequency in relation to the time unit chosen
Time Unit	Indicate if the number of trains is per Minute/Hour/Day/Week/Month
Favourite Route	
From Location/Waypoint/To Location*	
Current State	Draft/Submitted/Acknowledge-No interaction with CM/Acknowledge-Map to existing CM/ Acknowledge-Create a new CM/~~To be updated~~
Change to	Change the actual state of the CNA to any above state
Visibility of Message/Message	Applicants and IMs can send information to each other and set the visibility of this information

Once the user has filled in the necessary and desired fields, including the origin, destination, and waypoints (if necessary), they should select 'generate route':



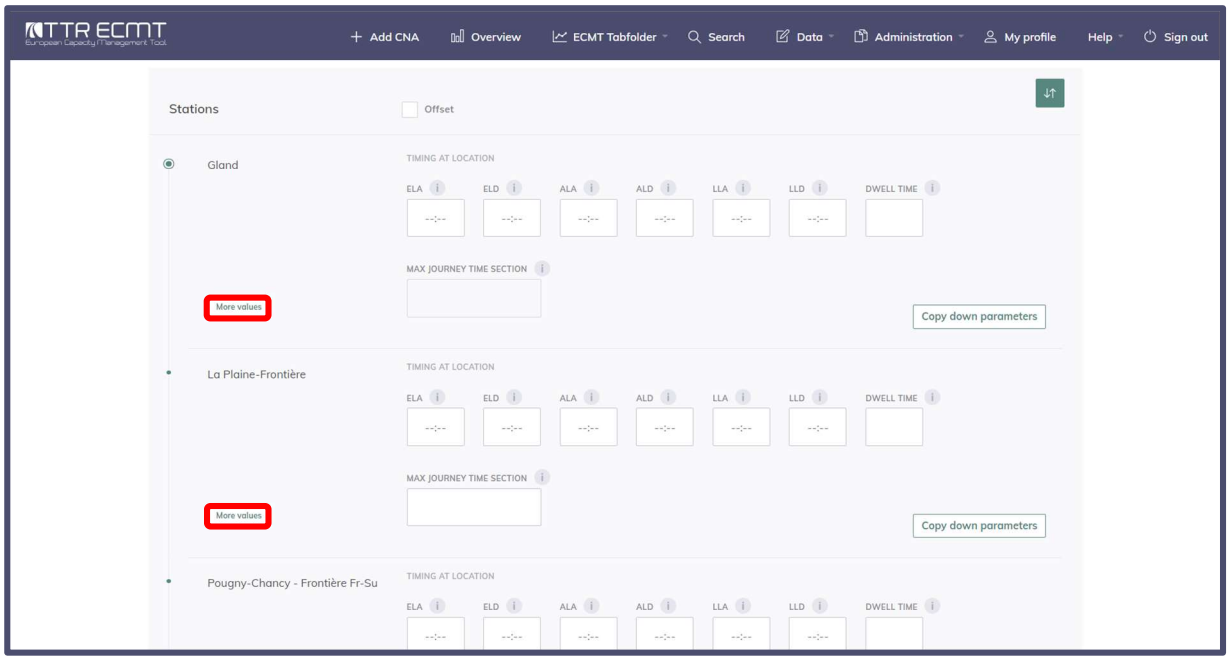
Upon generating the route, ECMT will display an overview of the major points along the route where the user can input timetable information, as well as other parameters, including setting the responsible applicant for any of the given PLCs. The PLCs which will generate, and thus those that the user will have the ability to input such information for are the origin, destination, any border points, and any waypoints which are specified by the user.

Unlike Capacity Model Objects, the user does not have to input an ALD for the origin and an ALA for the destination in order to submit a CNA, nor is any other timing information necessary to submission.

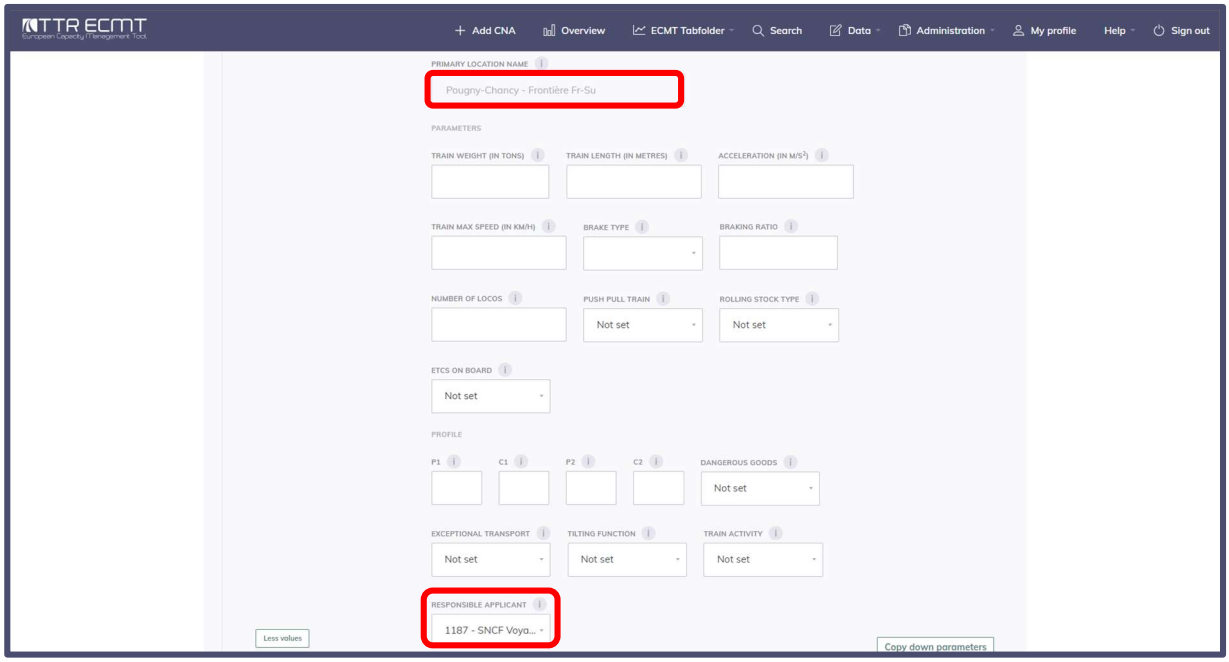
The following table includes the information which can be inputted once the route has been generated:

Generate Route	The user must generate the route in order to create the CNA
Map View	Allows the user to visualise the route on a map
Offset	If the CNA runs through midnight, select 'offset' and select an offset '1' at locations which the train runs through after midnight. This can be repeated with 2, 3, etc., when the train runs for more than two days
⇵	Swaps the origin and destination
ELA	Desired earliest arrival at waypoint
ELD	Desired earliest departure from waypoint
ALA	Desired actual arrival at waypoint
ALD	Desired actual departure from waypoint
LLA	Desired latest arrival at waypoint
LLD	Desired latest departure from waypoint
Dwell Time	Minimum amount of time the train will be stopped at the waypoint
Max Journey Time	The maximum desired amount of time that that the applicant would like their allocated path to take up between the selected PLC and the previous PLCs
More Values	The user can additionally indicate parameters such as weight, length, acceleration, speed, braking information, train information, combined transport profile, responsible applicant, and more
Copy down parameters	Copies additional location-specific parameters (including those found when clicking "more values")

To access additional fields beyond the timetable including the 'Responsible Applicant' field, the user should select 'More Values':

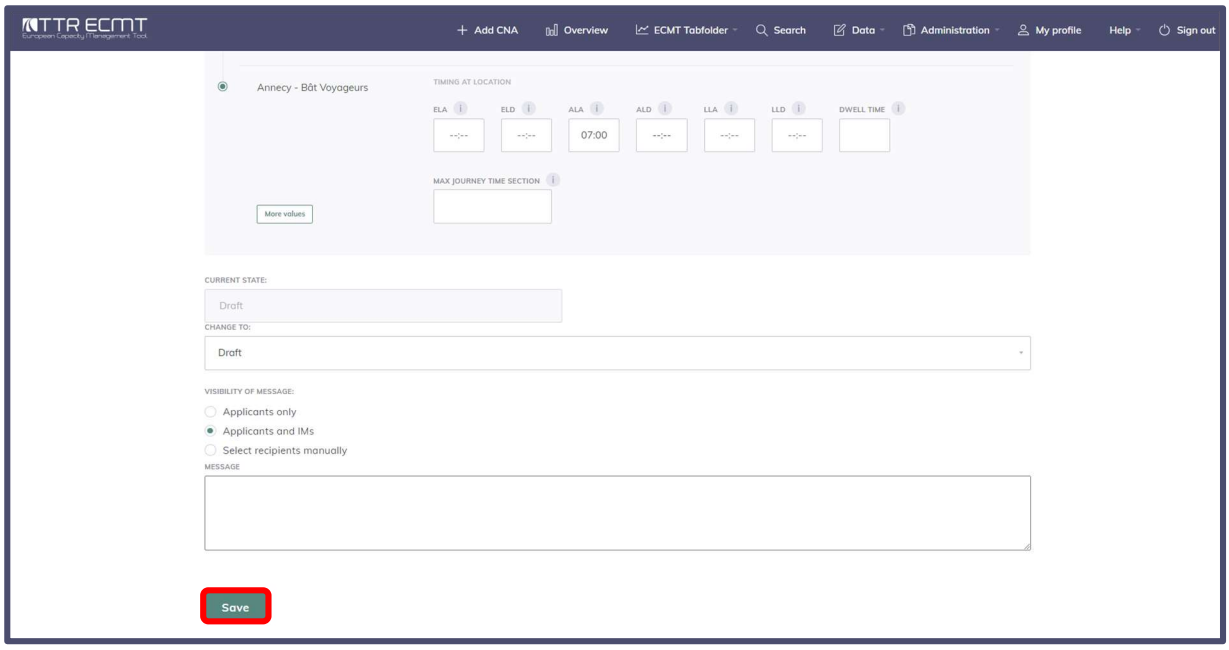


For international CNAs, the creating user can select partner applicants for PLCs along the CNA's route which occur outside of the user's country. In the following example, A user from Swiss Federal Railways has created a route which crosses the French border. The PLC named *Pougny-Chancy – Frontière Fance-Suisse* has appeared when the user selected 'Generate Route' because it is the first location in France which occurs on the route (border location). Here, the user might designate the French national railway company (SNCF Voyages) as the responsible applicant.



Upon creation of the CNA, the users from the RU which has been designated as the responsible applicant will receive an email which includes a link to the CNA. For more information on the harmonisation of CNAs between applicants, see section 2.2 (CNA Harmonisation).

Once the user has inputted the desired timing information and selected the responsible applicants (if necessary), they can select 'Save' to create the CNA.

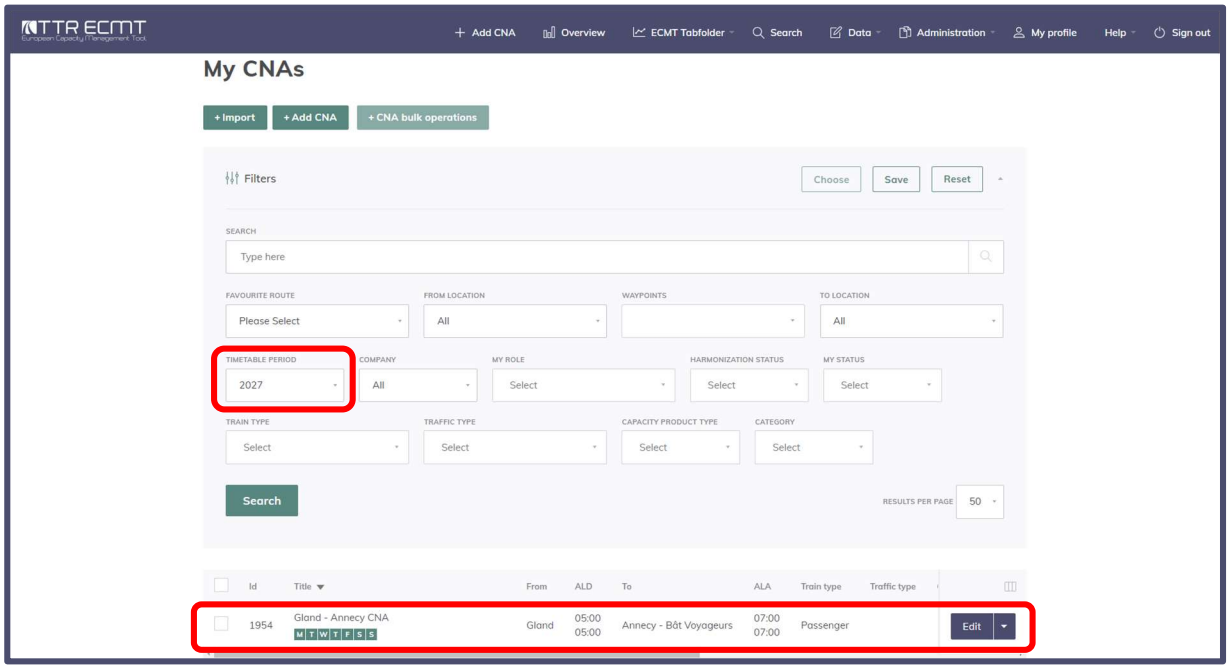


Here, the user is also able to change the state of the CNA to either 'Draft' or 'Submitted'. If there are responsible applicants designated that still need to input timing information or any other locally relevant information (max weight, whether dangerous goods are allowed, etc.) for the PLCs on their territory, the user should leave the CNA in the 'Draft' state.

3.1.2 CNA Frequency Creation

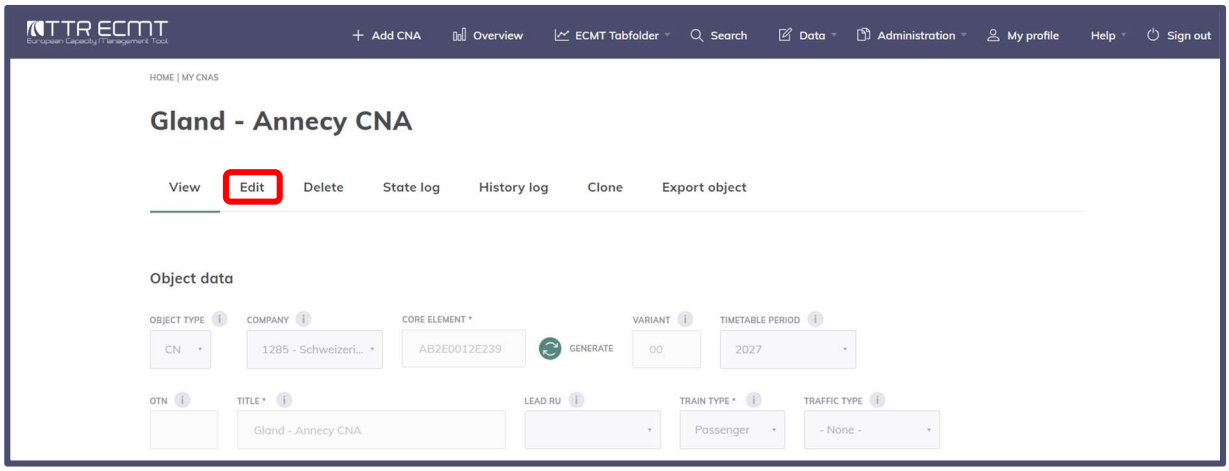
Capacity Needs Announcements can be for a single train, or for a pattern of repeating trains. ECMT allows the user to create frequencies or individual copies (clones) in order to accurately signal an applicant companies capacity needs to the Infrastructure Manager(s).

To create a frequency of a CNA, the user should first find a CNA which they have already created. These can be found by selecting 'CNA' from the 'Data' dropdown menu. From this page, the user can set search criteria to find the desired CNA, in this example, the user has searched based on the timetable year:



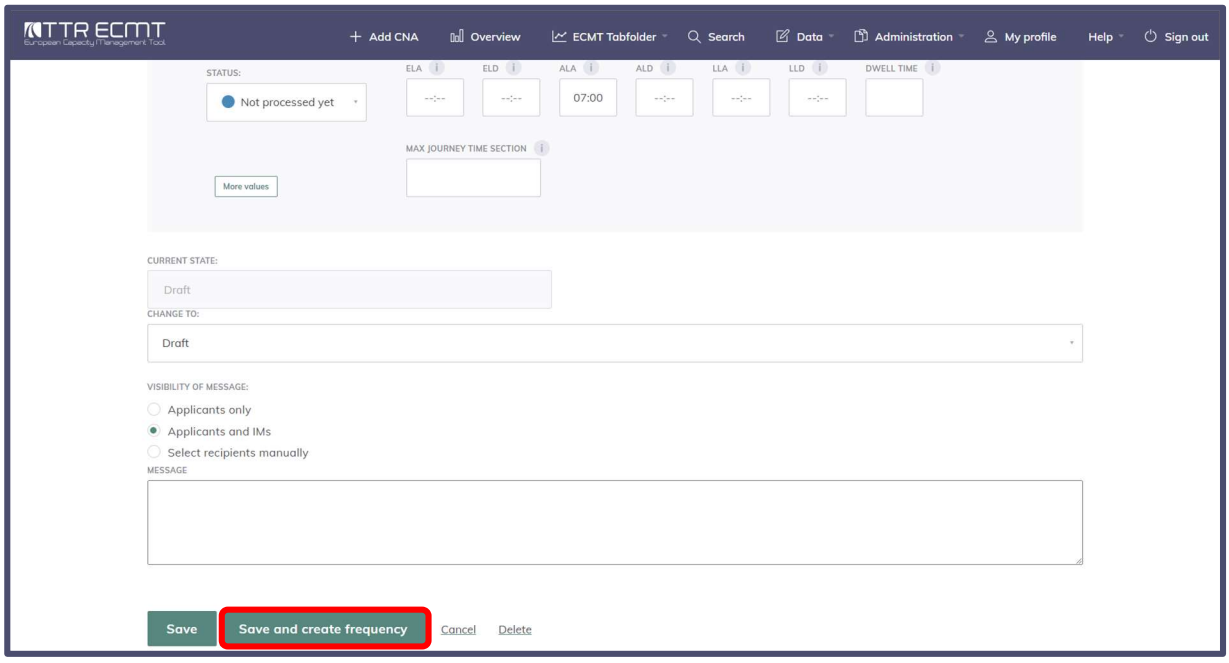
Upon selecting the desired CNA, the user will arrive at the CNA details page.

It is only possible to create a frequency of a CNA if the ALD and ALA fields have been filled. If the user did not input the appropriate ALD and ALA fields when creating the CNA, there user should select 'edit'

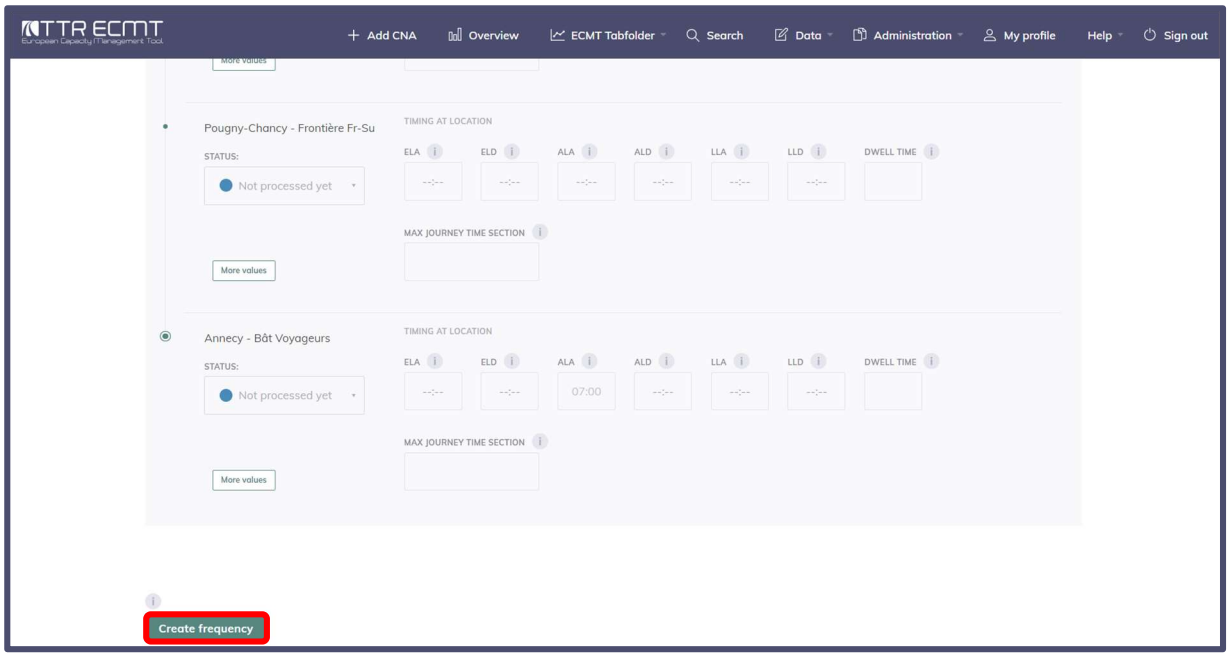


Once the user is in the 'edit' view, they should first scroll down to the route and designate a departure (ALD) time for the origin and arrival (ALA) time for the destination.

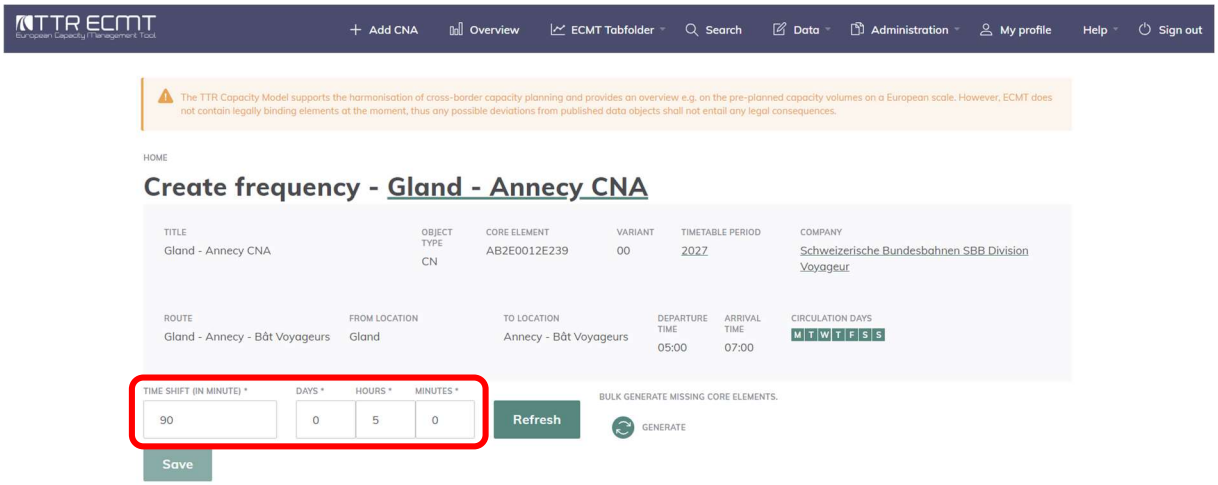
Once the user has checked to make sure these fields are correctly filled out, they should select 'Save and create frequency'



If the user had already specified ALD and ALA times for the origin and destination, they can simply scroll to the bottom of the page and select 'Create Frequency'

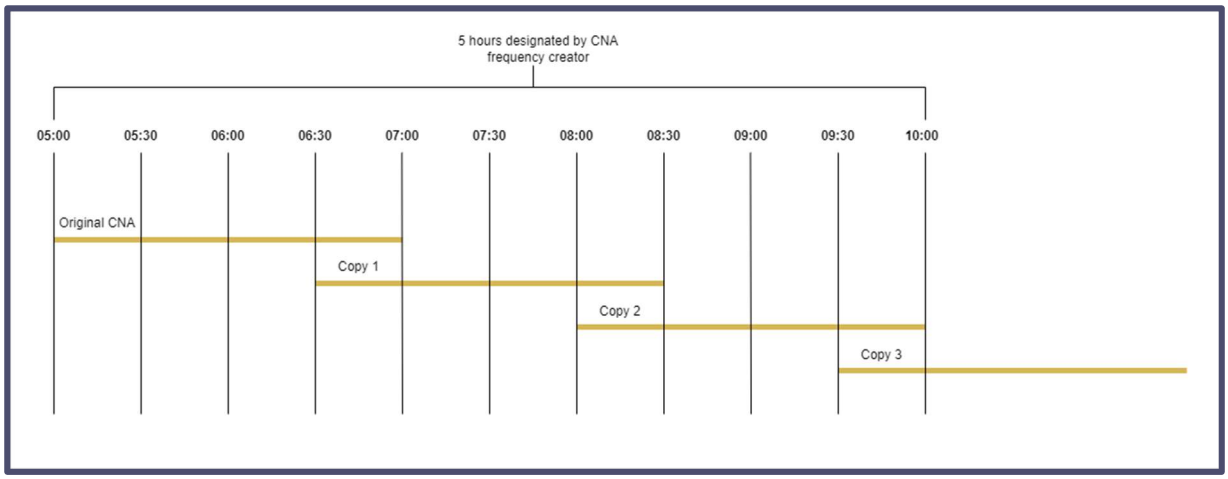


Upon selecting 'Create Frequency' the user will arrive at the create frequency page. Here they can view essential timing and route information and set the desired time shift and frequency for that shift to occur.

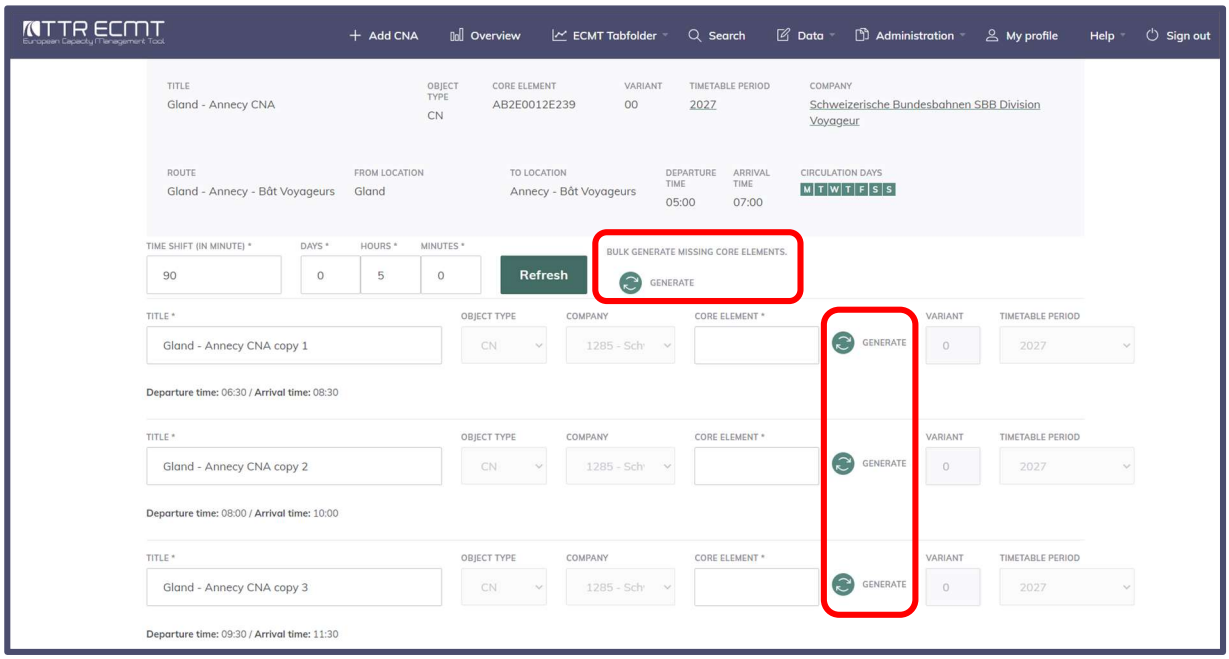


Time Shift (In Minute)	How many minutes in the future the copy of the object should be created
Days/Hours/Minutes	For how long the frequency creations will occur

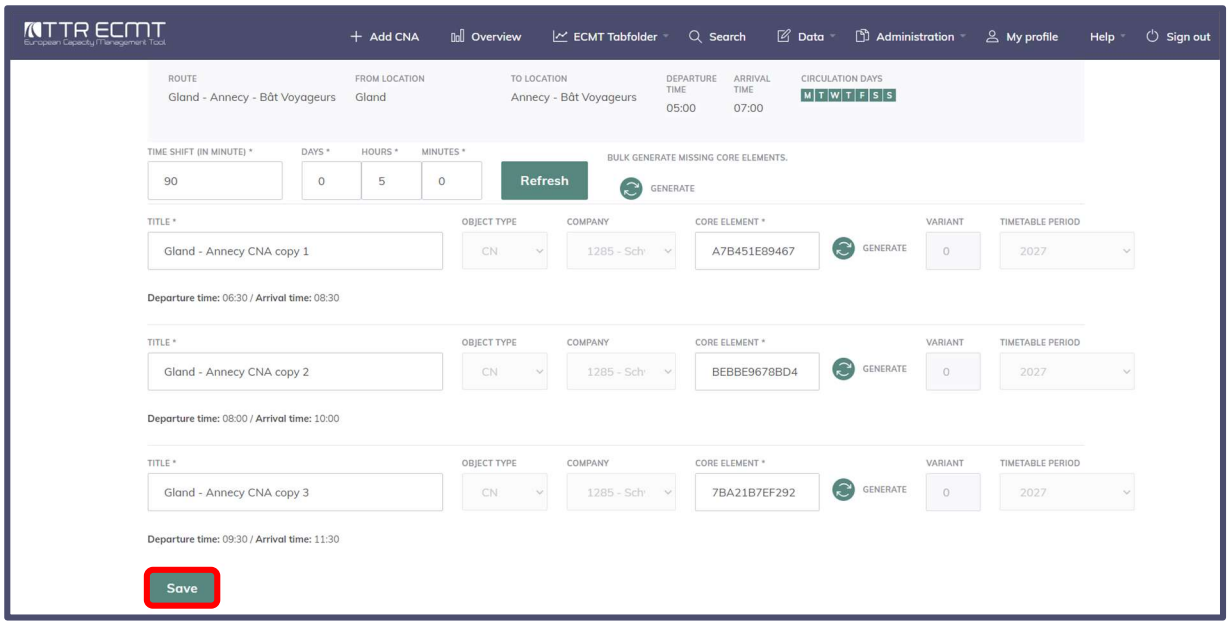
In this example, the user would like for the CNA to repeat every 90 minutes, and for it to repeat for a period of 5 hours. This results in 3 copies being created, given that the there is no way to visualise CNAs on a diagram as is the case with CMOs, the following visual illustrates the nature of this frequency:



Once the user has set the desired frequency, they can select 'Refresh' to generate the copies. Following this, the user can rename the copies (if desired) and generate core elements for the newly created CNAs. Core elements can either be manually entered or automatically generated via the 'Bulk Generate Missing Core Elements' button or the individual 'Generate' buttons.



Once the user has confirmed that the copies are occurring at the desired frequency, changed the titles of the copies (if desired), and inputted or generated the core elements, they can select 'Save' to create the new objects.



3.1.3 CNA Excel Import

Users may choose to import their CNAs via Excel rather than create them manually in the graphical user interface. This option is especially helpful where there is a high number of CNAs.

3.1.3.1 CNAs in Excel

The data to be included in a CNA Excel file is roughly the same data which must be inputted when manually creating a CNA in ECMT. In order to successfully import CNAs into ECMT via an Excel file, this data must be organised in a specific format.

The following is a table indicating each column which must be present in the excel file. Mandatory fields are indicated with an asterisk (*). The text in the column header must match exactly what is shown in the table. A template of the excel format can be downloaded via ECMT by selecting 'Import Sheets' under the 'Help' tab.

CNA Import Sheet Fields (valid from timetable year 2026)		
Field	**Column**	**Description**
ID	**A**	Not mandatory from timetable year 2026
ObjectType	**B**	Not mandatory as ECMT will recognise that the object as CN (CNA) when importing through the CNA import page
Company	**C**	Not mandatory as ECMT will automatically recognise the company as the importing user's company
Core*	**D**	12 character alphanumeric string
Variant	**E**	A version of the CNA with the same Core Element
TimetableYear*	**F**	The timetable year in question (2026, 2027, etc.)
RPTI_ObjectType	**G**	(Reference Planned Transport Identifier) relates a CMO to a past train run. All the "RPTI"-fields refer to the respective field of the object being referenced (i.e. "RPTI_Company" is the Company-value of the referenced train, etc.)
RPTI_Company	**H**	
RPTI_Core	**I**	
RPTI_Variant	**J**	
RPTI_TimetableYear	**K**	
ReasonOfReference	**L**	

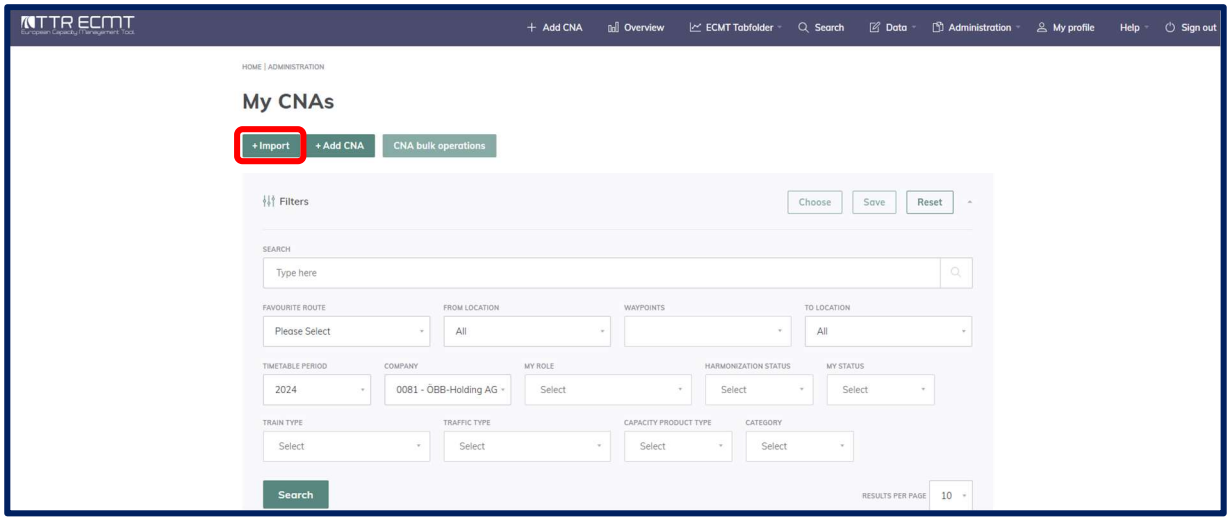
OTN	**M**	Operational Train Number
Title*	**N**	Free text title of the object
CMVariant	**O**	If the user has created CM variants in ECMT, they can include the title of the variant here
LeadRU	**P**	
CoordinatingIM	**Q**	
TrainType*	**R**	Freight, Passenger, or Other
TrafficType	**S**	High_speed, Long_Distance, Express_regional, Regional, Wagonload, Blocktrain, Combined_transport
CapacityProductType	**T**	Annual TT, Rolling Planning, Ad-Hoc, or Unplanned
Category*	**U**	National, International
StatusQuo	**V**	
TrafficContracted	**W**	
TypeOfContract	**X**	
MaxJourneyTime	**Y**	
CountryCodeISO*	**Z**	Two capital letter country indicator (ex: Austria = AT). Full list of codes available here: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Country_codes
LocationPrimaryCode*	**AA**	Numeric PLC code without the country code
PrimaryLocationName	**AB**	Optional: the only location data that will be read is the PLC code and corresponding country code
TrainActivity	**AC**	Indicated by a four digit code, see annex A for the list of codes and their meanings
ELA	**AD**	Earliest desired arrival
ELA Offset	**AE**	If the train runs through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
ELD	**AF**	Earliest desired departure
ELD Offset	**AG**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
ALA*	**AH**	Desired arrival - mandatory for destination
ALA Offset	**AI**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
ALD*	**AJ**	Desired departure - mandatory for origin
ALD Offset	**AK**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
LLA	**AL**	Latest desired arrival
LLA Offset	**AM**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
LLD	**AN**	Latest desired departure

LLD Offset	**AO**	If this location occurs after the train has run through midnight, insert a '1' in this field, successive numbers can be inserted for all following day of a continuous train run
DwellTime	**AP**	Minimum dwell time given in minutes
MaxJourneyTimeSection	**AQ**	
ResponsibleApplicant	**AR**	
TrainWeight	**AS**	
TrainLength	**AT**	
TrainMaxSpeed	**AU**	
PlannedSpeed	**AV**	
Acceleration	**AW**	
BrakeType	**AX**	
BrakingRatio	**AY**	
NumberOfLocos	**AZ**	
PushPullTrain	**BA**	
RollingStockType	**BB**	
ETCSOnBoard	**BC**	European Train Control System
P1	**BD**	Combined transport profile - only to be filled for combined transport trains
C1	**BE**	Combined transport profile - only to be filled for combined transport trains
P2	**BF**	Combined transport profile - only to be filled for combined transport trains
C2	**BG**	Combined transport profile - only to be filled for combined transport trains
DangerousGoodsIncluded	**BH**	
ExceptionalTransport	**BI**	
TiltingFunction	**BJ**	
ValidFrom*	**BK**	Mandatory: please use a Date-Format in this field. The date has to be within the timetable year specified in Column F.
ValidTo*	**BL**	Mandatory: Please use a Date-Format in this field. The date has to be within the timetable year specified in Column F.
Monday*	**BM**	Conditionally mandatory: Either Circulation Days (BG-BM), TimeUnit and Frequency (BN-BO) or Bitmapdays (BP) has to be given. If multiple are given, Bitmapdays is given priority. (Bitmapdays > Weekdays > Frequency)
Tuesday*	**BN**	
Wednesday*	**BO**	
Thursday*	**BP**	
Friday*	**BQ**	
Saturday*	**BR**	
Sunday*	**BS**	

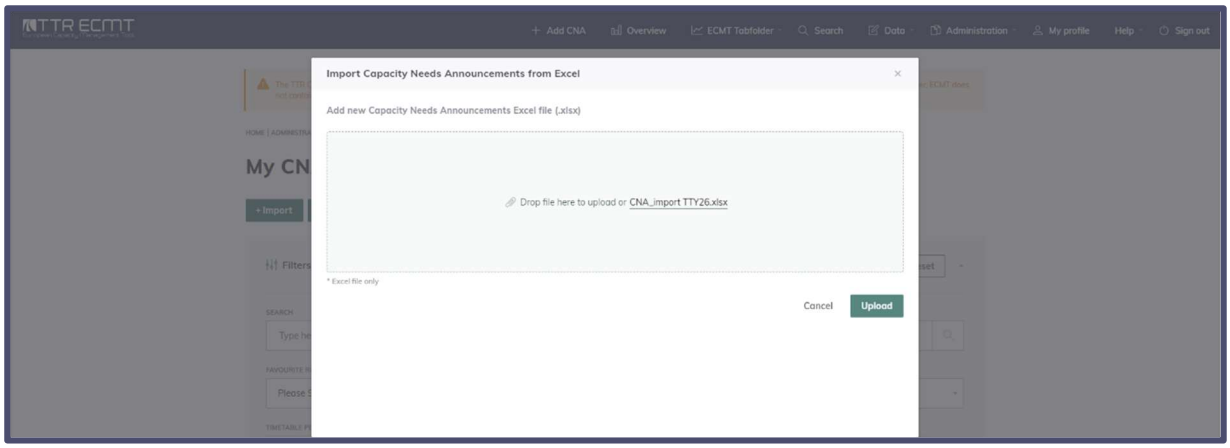
TimeUnit*	**BT**	Conditionally Mandatory: Accepted inputs are Minute, Hourly, Daily, Weekly, Monthly, Annually. Either Circulation Days (BG-BM), TimeUnit and Frequency (BN-BO) or Bitmapdays (BP) has to be given. If multiple are given, Bitmapdays is given priority. (Bitmapdays > Weekdays > Frequency)
Frequency*	**BU**	Conditionally Mandatory. Either Circulation Days (BG-BM), TimeUnit and Frequency (BN-BO) or Bitmapdays (BP) has to be given. If multiple are given, Bitmapdays is given priority. (Bitmapdays > Weekdays > Frequency)
BitmapDays*	**BV**	Conditionally Mandatory. Accepted Input: String of 1/0 the length of the validity period. Each character corresponds to a day of the period.
Comment	**BW**	Comments can optionally be attached to the CNA

3.1.3.2 CNA Excel Import Process in ECMT

To import CNAs via excel, the user can select the '+Import' button on the top of the My CNAs page.



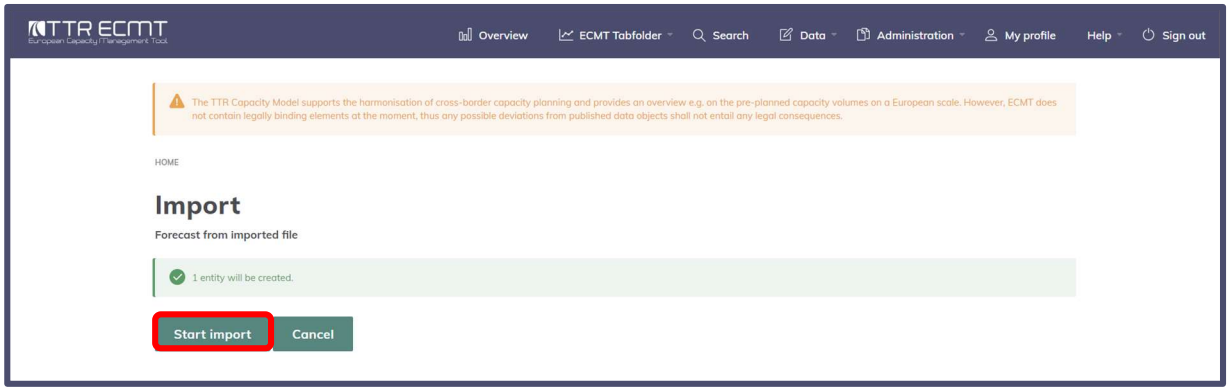
Here a new window will appear in which the user drop or choose an excel file, then upload it.



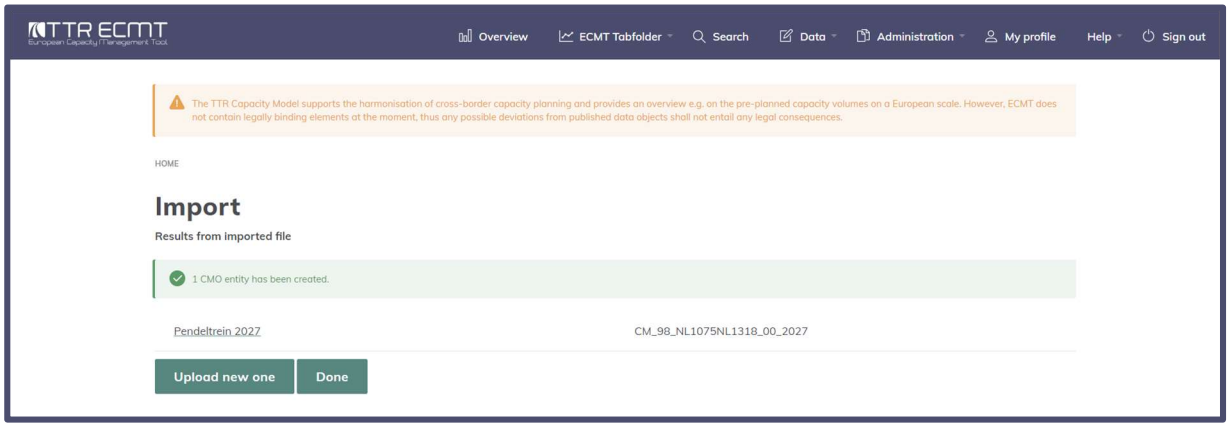
3.1.3.3 Validation and final creation of CNAs via Excel Import

Upon the initial import of the excel sheet, the user will arrive at the validator page. If there are any errors in the format of the excel file, they will be identified by the system and presented to the user.

Upon making the necessary fixes in the excel import, the user can select the 'Start import' button to import the CNA(s) into ECMT.



Once the CNA is created, the user can select the link to view its details page, where the CNA can also be edited or deleted.



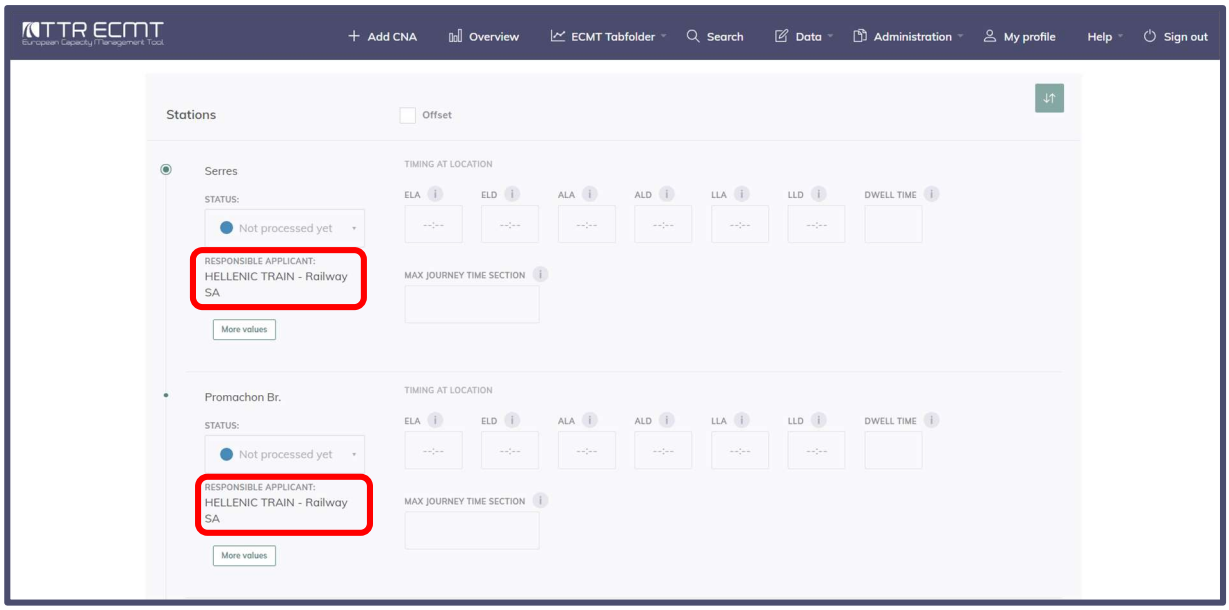
3.2 CNA Harmonisation

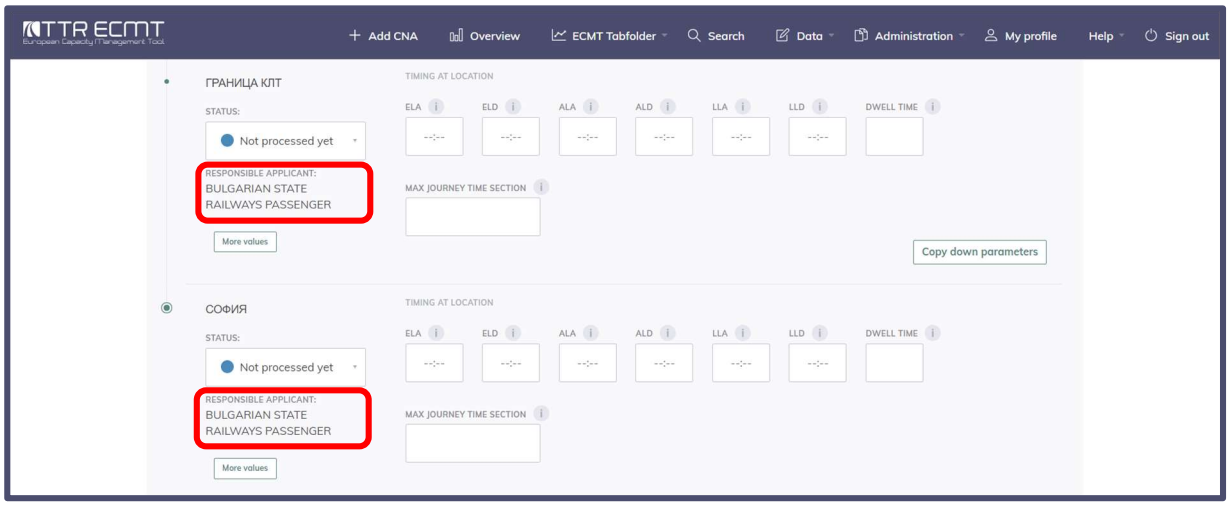
CNAs are an important tool for applicants to use in order to indicate their business needs to Infrastructure Managers as they undertake advance capacity planning activities. A major added value of ECMT is that it facilitates the indication of borderless capacity needs through cross border CNAs.

3.2.1 CNA Harmonisation workflow

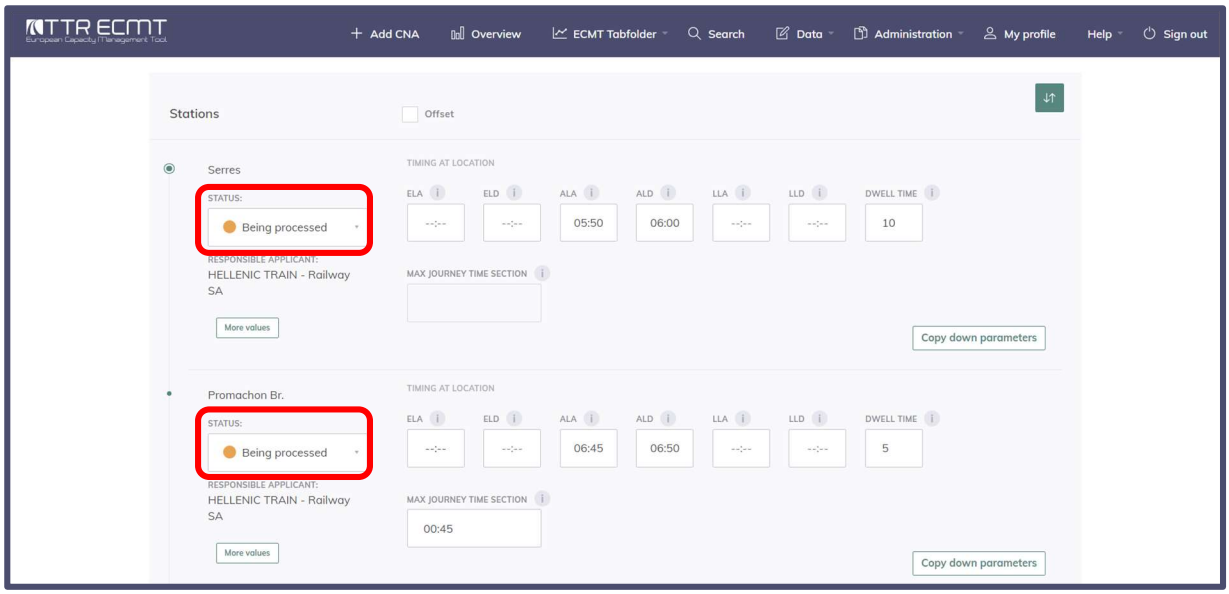
The CNA Harmonisation workflow starts with a user creating a cross border CNA and designating a responsible applicant at the relevant points.

In the following visuals, the user belongs to the Greek passenger railway company Hellenic Train, and they have created a CNA from Serres, Greece, to Sofia, Bulgaria. The user has set the responsible applicant at the origin and final PLC within Greece as Hellenic Train and the first PLC in Bulgaria and the destination as the Bulgarian State Railways Passenger Company. This is clearly shown in the stations overview on the details page of the CNA:

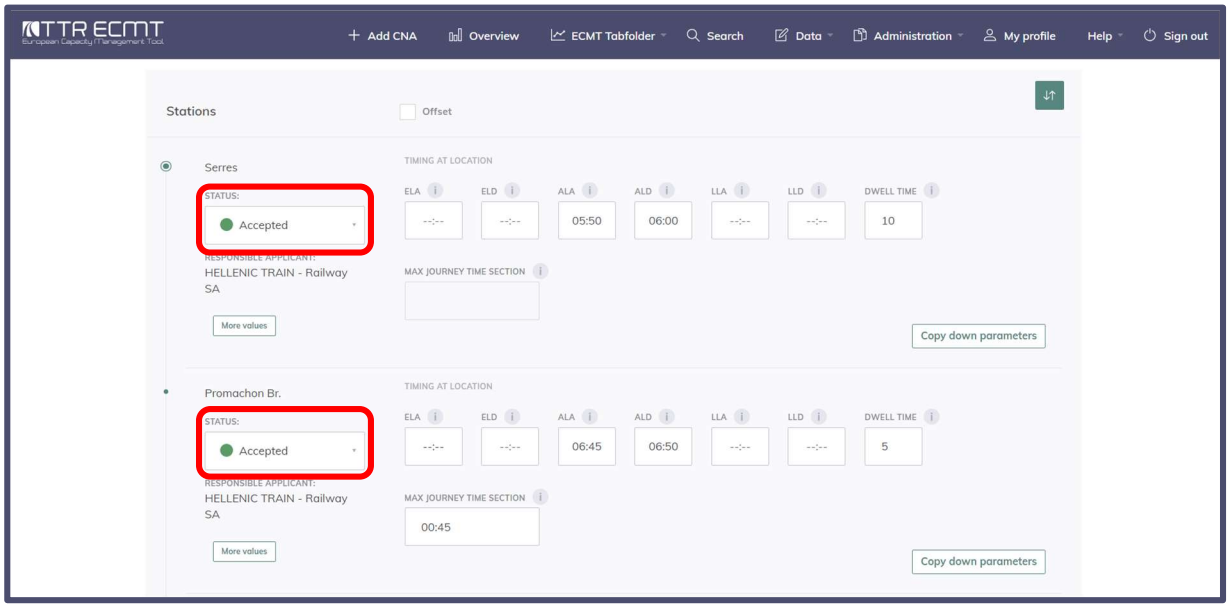




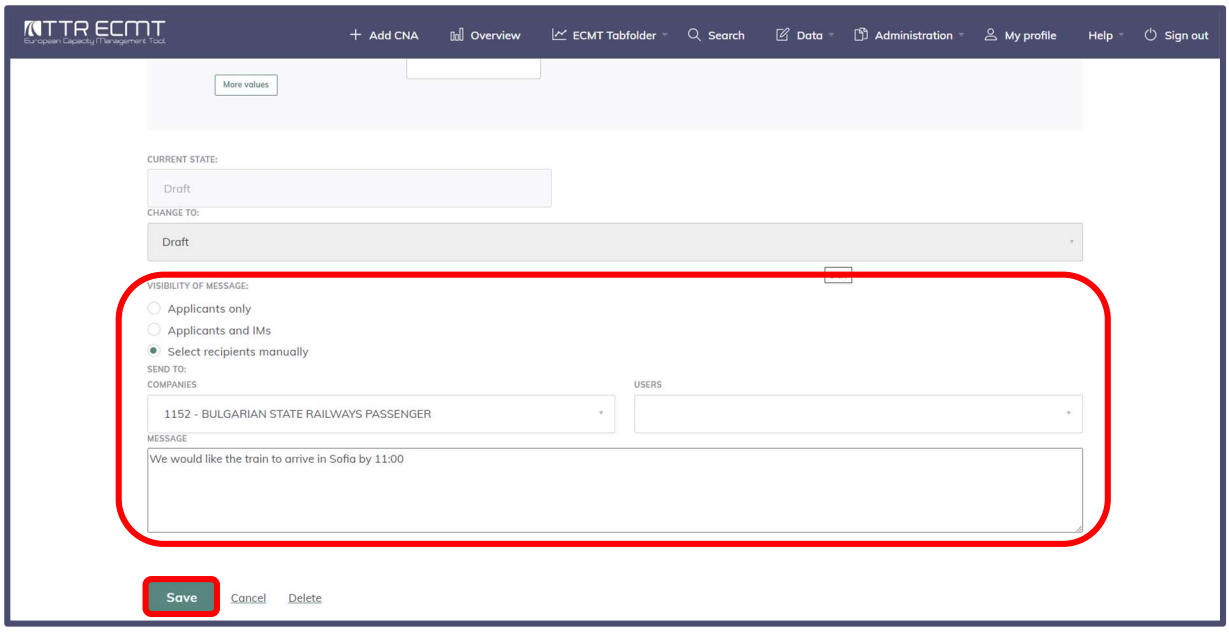
The Greek user already has a clearly defined business plan, and thus would like to input the desired timing for the locations in their territory. Once the user begins inputting values to these fields, the ‘Status’ automatically changes from ‘Not processed yet’ (blue) to ‘Being processed’ (yellow):



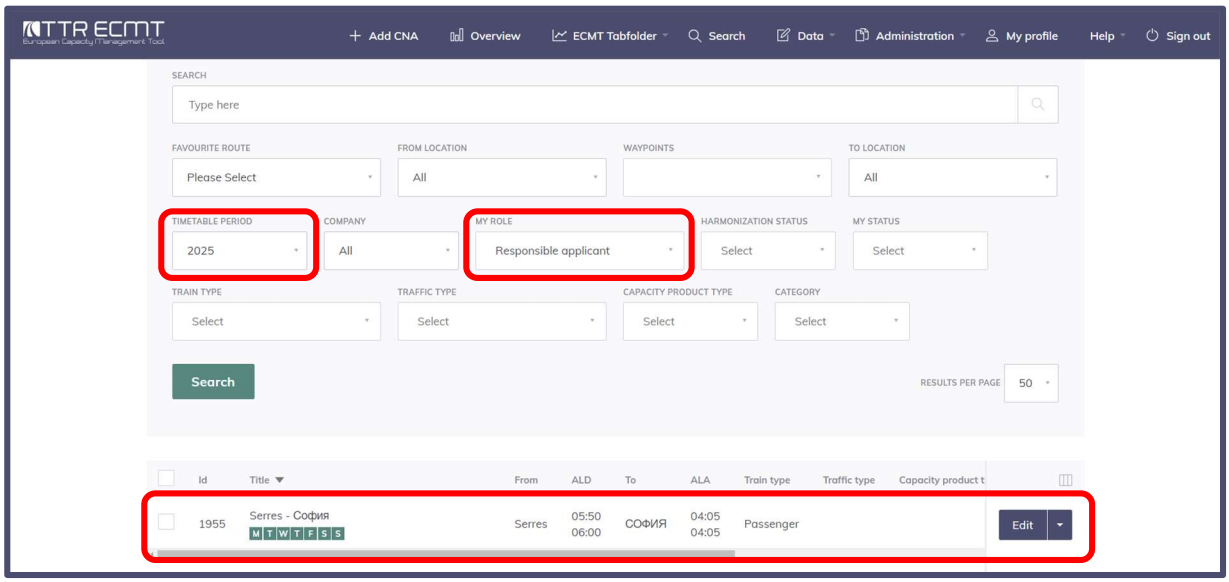
Once the Greek user has finished inputting their desired timing information, they can manually change the status to 'Accepted':



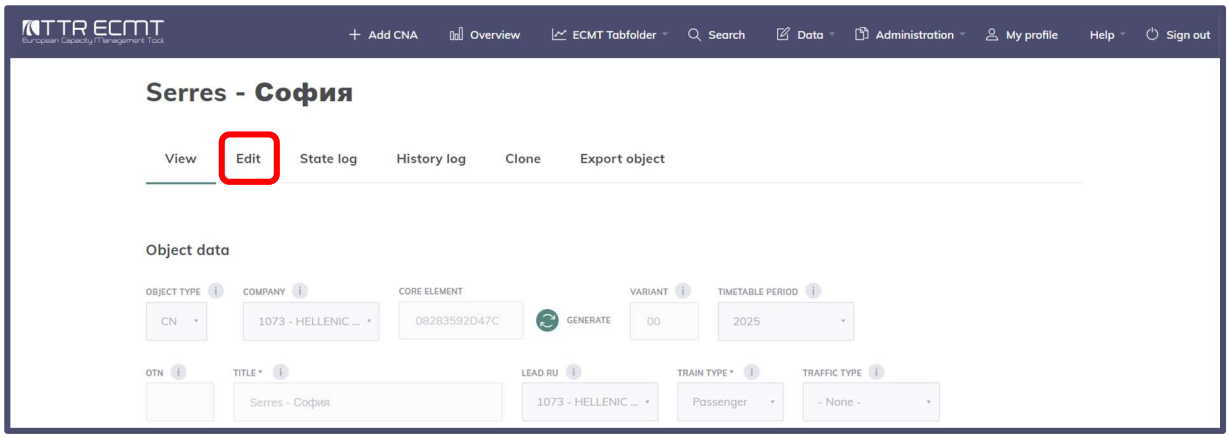
Once the desired time information for the Greek user is defined, the user can scroll to the bottom of the page, where they can optionally attach a message which will be viewable in the details page of the CNA. Additionally, the user can assign only one company or one specific user to receive the message. Following this, the user can select 'Save' to update the CNA.



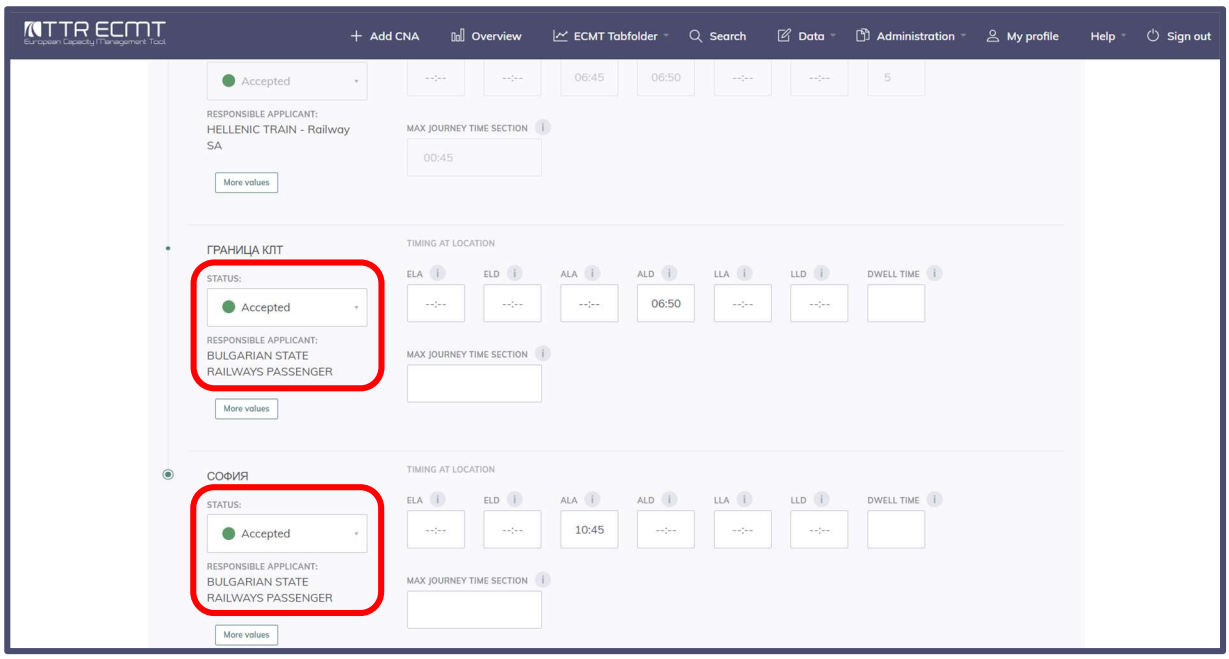
In the following visual the user works for the Bulgarian the National Railway Passenger Company. This user can view the CNAs on which they are a responsible applicant by selecting 'CNA' under the 'Data' tab. Here, the user can adjust the field 'My Role' to 'Responsible Applicant', and filter for the desired timetable year.



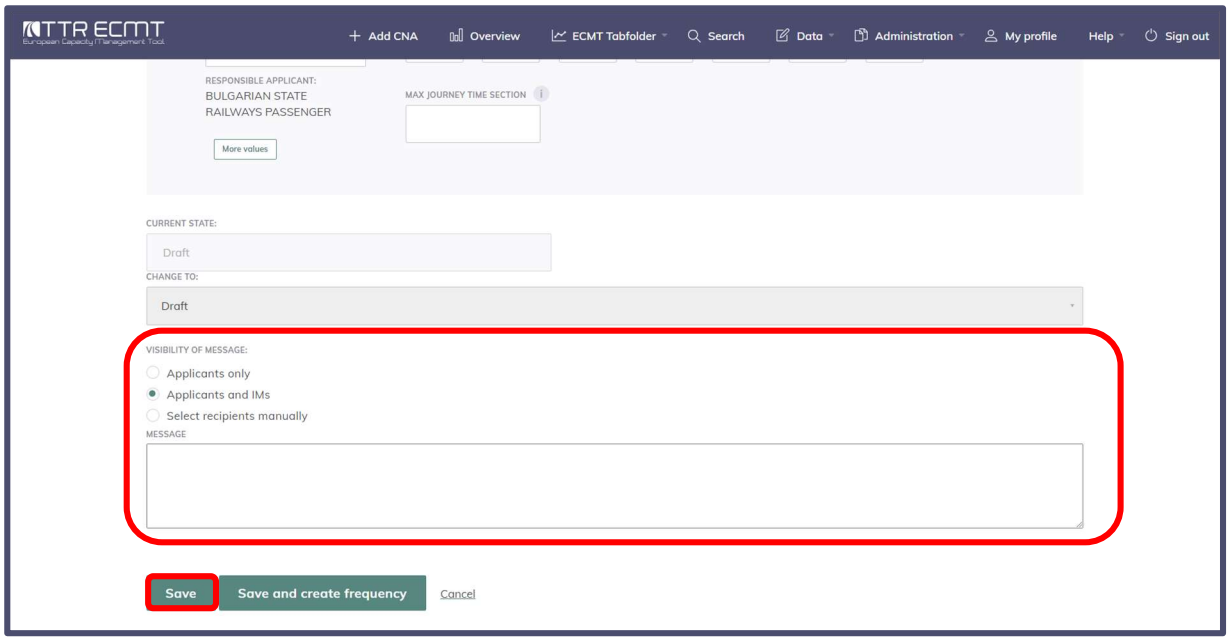
Once the user selects the desired CNA, they will be brought to the CNA's details page. From here, the user should select 'Edit'



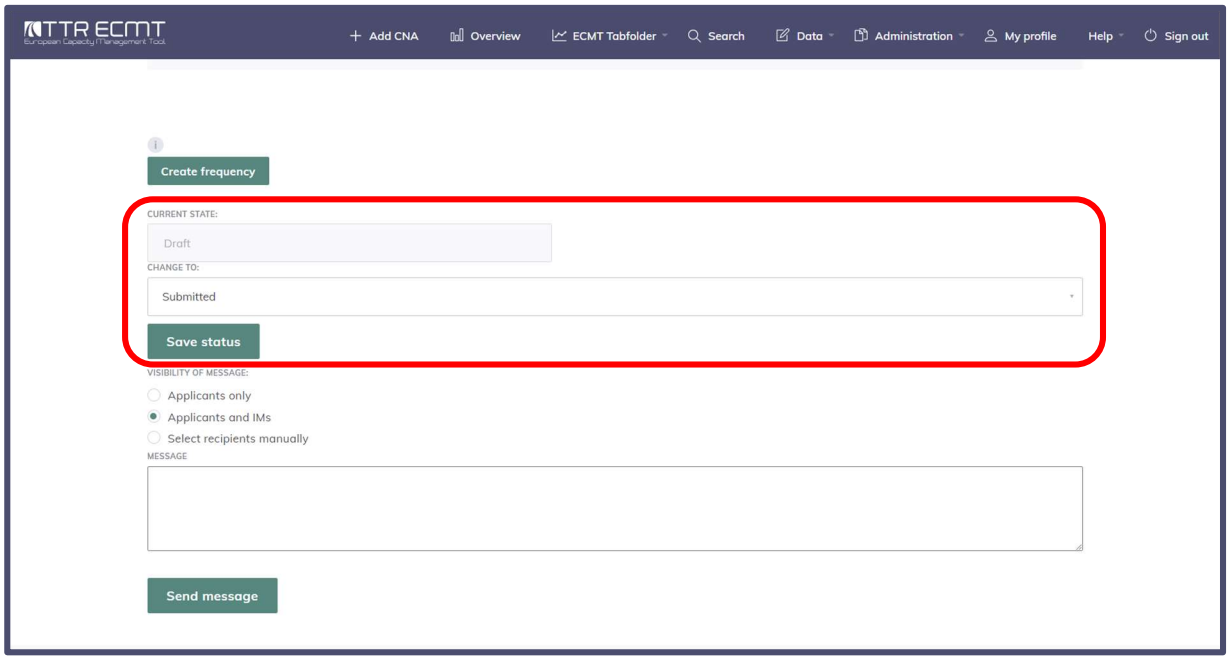
Once on the edit page, the Bulgarian user can scroll down to the stations overview and input any desired timing information or extra information under 'More Values'. As with the leading applicant, the status will automatically change from 'Not Processed Yet' (Blue) to 'Being Processed' (Yellow) as they input the values. Once the user has finalised their data input, they can manually change the status to 'Accepted' (green), or, should they reject the premise of the CNA, set the status to 'Not Accepted' (red).



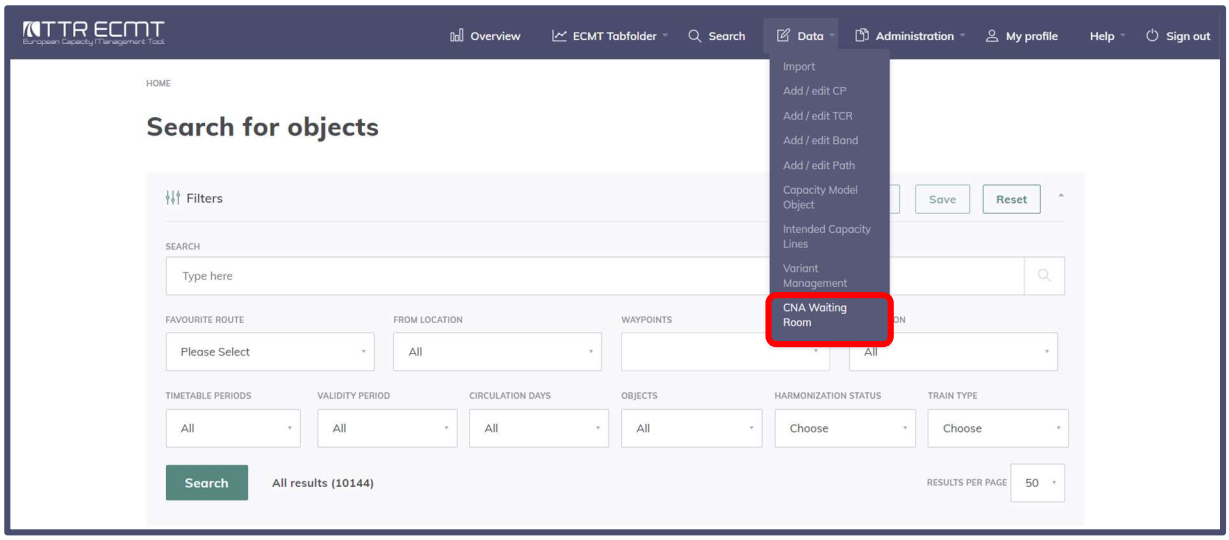
The Bulgarian user can then leave a message or update the CNA with their times and status by pressing 'Save':



When the Greek user views this CNA, they will see that their Bulgarian counterparts have updated the timetable info on their side of the border and set the status on those PLCs to 'Accepted' (Green). Once the Greek user is satisfied that the CNA is ready to be submitted to the infrastructure manager(s), they can change the state of the CNA from 'Draft' to 'Submitted', and select 'Save Status' to update the CNA.



Once the CNA's status has been set to submitted, it will be available for the infrastructure manager(s) to view. In the following visual, the user belongs to the Greek Infrastructure Manager *Organismós Sidirodrómon Elládos*. This user can see all CNAs which have been submitted in their territory by selecting 'CNA Waiting Room' under the 'Data' dropdown menu.



Here, the user can filter the search results in order to find the desired CNA. Once the user has opened the CNA's detailed view, they can change the state of the CNA based on what they choose to do with it. The available states are as follows:

Acknowledge – No interaction with CM	The submitted CNA will be taken into consideration during the creation of the draft Capacity Model
Acknowledge – Map to existing CM	The submitted CNA will be taken into consideration during the creation of the draft Capacity Model and the CNA is reflected in an already existing CMO
Acknowledge – Create new CM	The submitted CNA will be taken into consideration during the creation of the draft Capacity Model. The IM will create a Capacity Model Object based on the CNA. **For more information on creating CMOs from CNAs see section 1.1.4.**
Not fully considered	Indicates that the CNA was not able to be fully taken into account when creating CMOs
Submitted	The original status of the CNA, indicates that the IM has not yet addressed the CNA

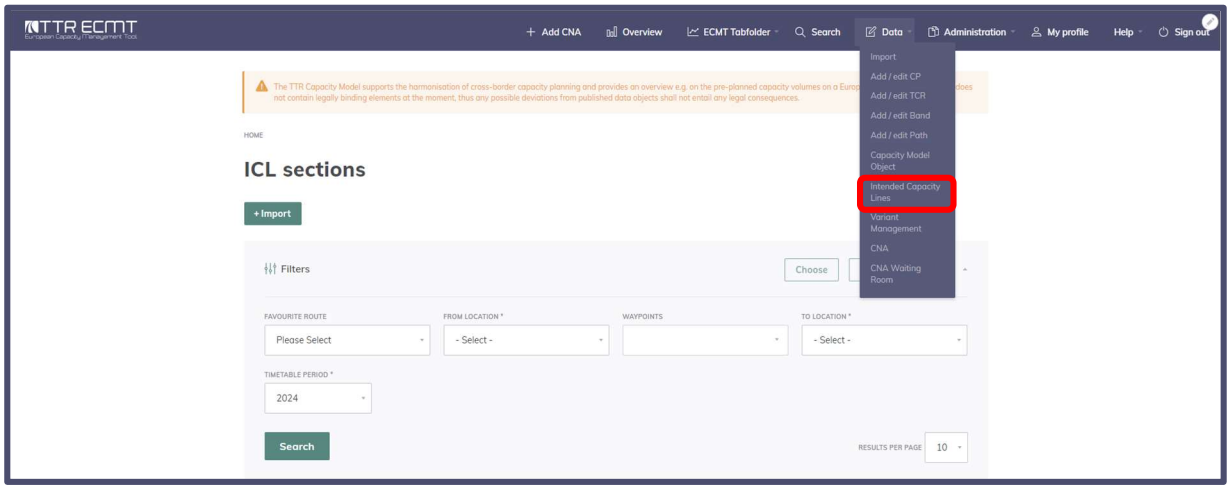
4 Intended Capacity Lines (ICL)

The Intended Capacity Usage Line (ICL) indicates the maximum number of volumes (capacities) which can be accommodated without paying special attention to capacity planning/extraordinary traffic management measures. The aim for the calculation of the intended capacity line is to provide a clear picture on the planned capacity situation and to detect pressure points where the IMs have to make additional efforts to ensure the stability of the timetable.

Through the ICL, IMs and applicants will have a clear picture on the number of unplanned capacities, which could be available for ad hoc requests during the timetabling phase of the TTR process.

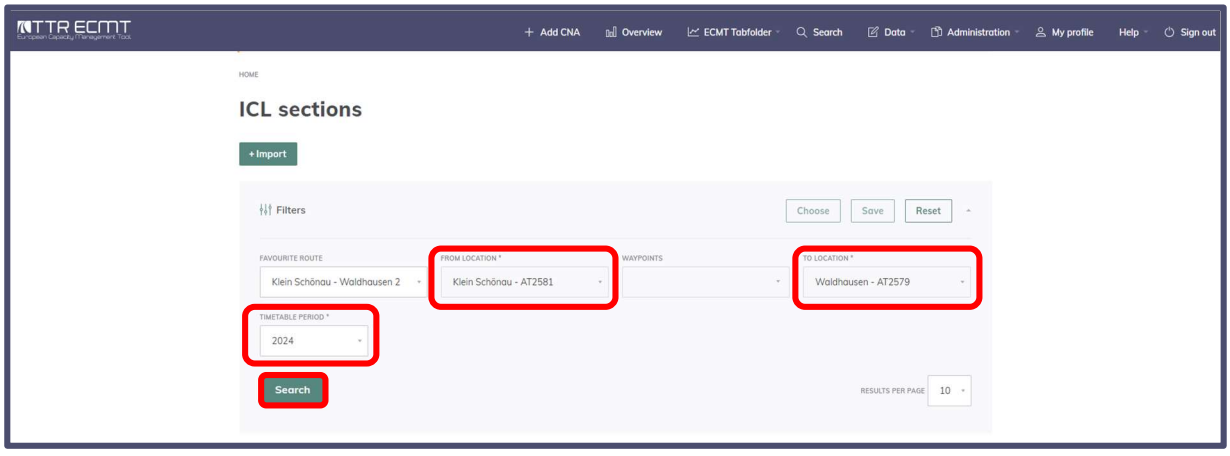
4.1 Object Creation

ICLs can be created directly in ECMT, or they can be imported via Excel. To access the ICL sections page, the user should select 'Intended Capacity Lines' from the 'Data' drop down menu.

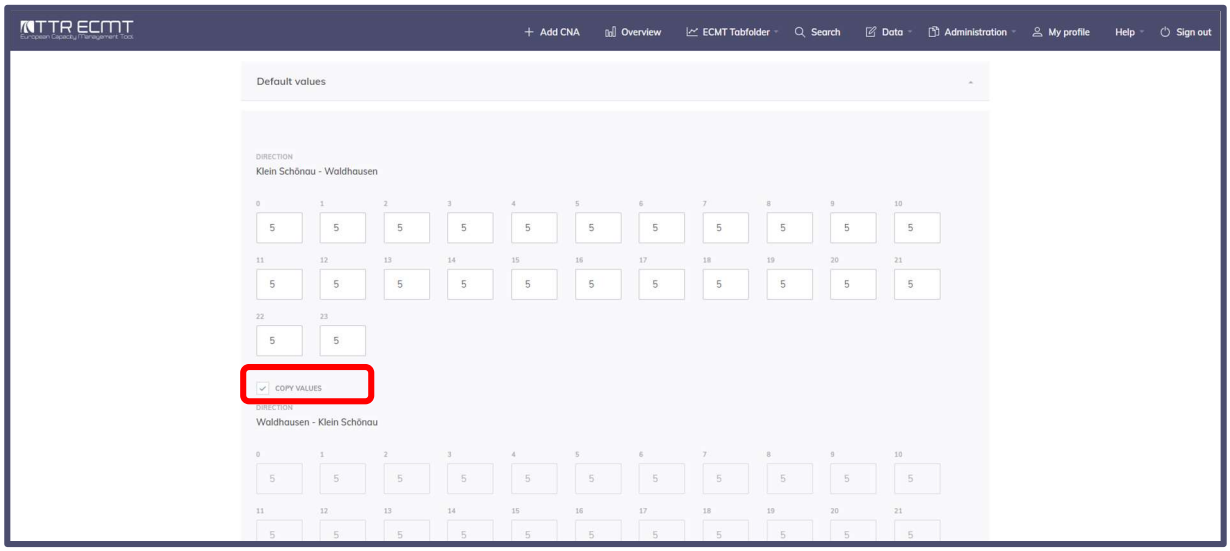


4.1.1 ICL Manual Creation

To manually create an ICL through ECMT's graphical user interface, the user should set the 'From/To Location' and the 'Timetable period'. Once these fields are filled with the desired criteria, the user should select 'search'.



In the 'Default values' section, the user can set the ICL, in other words the maximum number of volumes which the infrastructure can accommodate in each hour of the day and on every segment of the line selected. The system automatically fills in the same values for the other direction, but these values can be changed and set separately by unselecting the 'Copy Values' field.

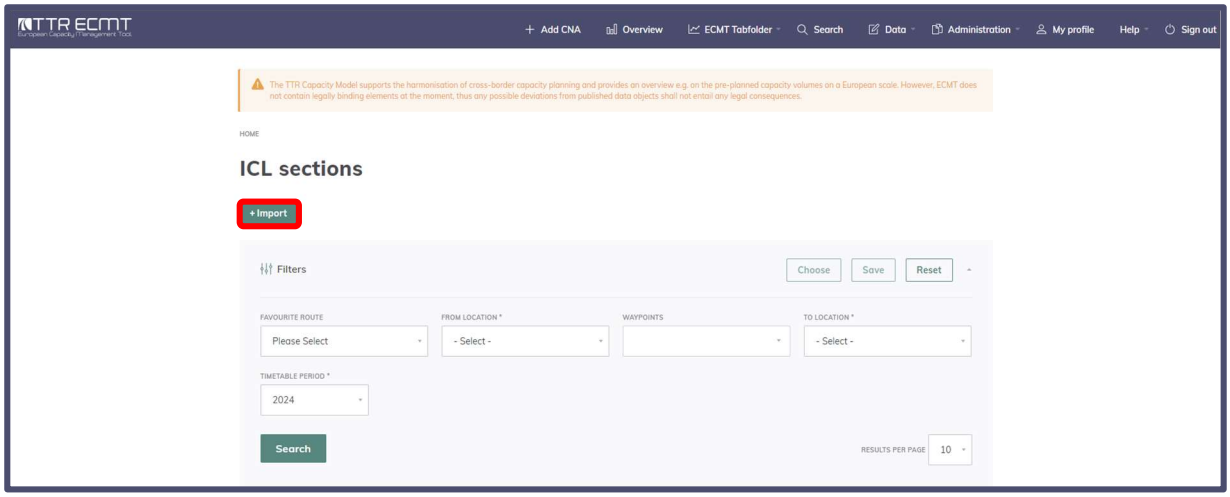


If there is already ICL data on the line or segment which the user is editing, the user can select if they would like to 'Override', 'Ignore' or 'Edit' the existing data. The user can select 'Save' to set the ICL.

Users can also export an ICL into an Excel file by selecting 'Export ICLs to Excel'. This may be useful for users as it can be used as a template for creating ICL import sheets.

4.1.2 ICL Creation via Excel Import

To import ICLs via Excel, the user can select the '+ Import' button on the top of the ICL sections page. Here, a new window will appear where the user can select or drag and drop their desired file.



The following table indicates each column and the data to be contained therein which must be present in the excel file. The mandatory fields are indicated with an asterisk (*). The text in the column header must match exactly what is shown in the table. A template of the excel format can be downloaded via ECMT by selecting 'Import Sheets' under the 'Help' tab.

ICL Import Sheet Fields (valid from timetable year 2025)		
Field	**Column**	**Description**
ID	**A**	Not mandatory starting from timetable year 2026
Company	**B**	Not mandatory as ECMT will automatically recognise the company as the importing user's company
FromLocationCountryCodeISO*	**C**	The 'from' ISO country code belonging to the following PLC number, for example: CH
FromLocationPrimaryLocationCode*	**D**	The 'from' PLC number, for example: 1031
ToLocationCountryCodeISO*	**E**	The 'to' ISO country code belonging to the following PLC number, for example: CH
ToLocationPrimaryLocationCode*	**F**	The 'to' PLC number, for example: 1030
TimetableYear*	**G**	The timetable year in question (2026, 2027, etc.)
ICL_at_0 - 23	**H-AE**	Volume number as per hours

4.1 ICLs in ECMT

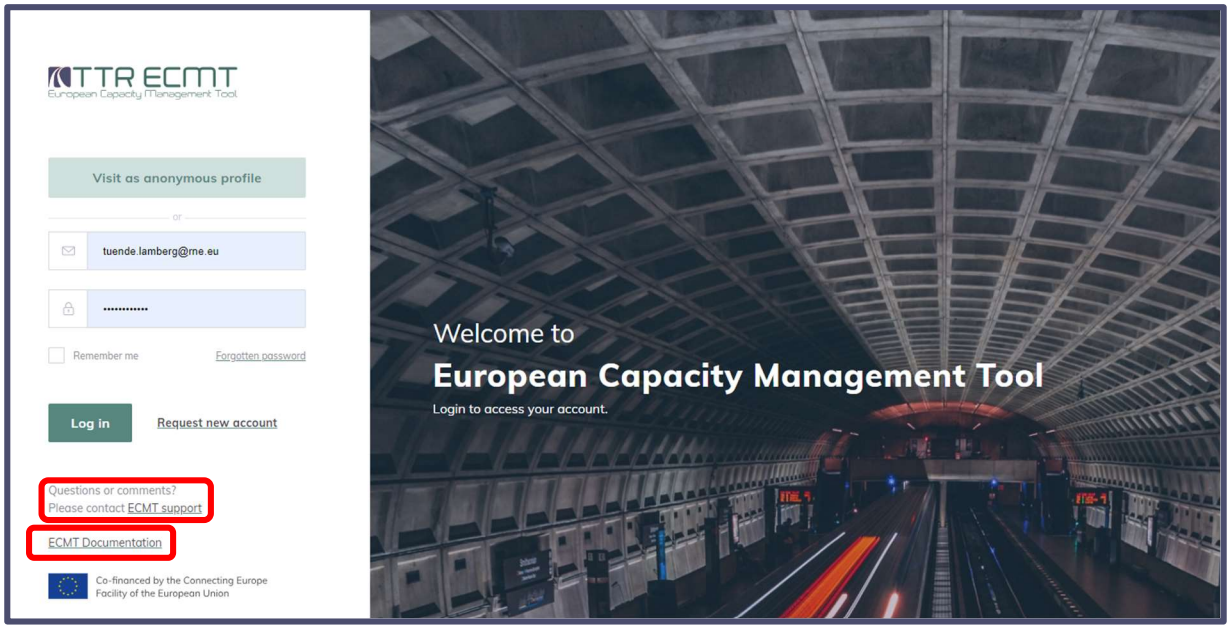
In ECMT the Segment Overview shows the capacity situation between two PLCs, to gather information on the planned volumes for a border section. **See section 1.2.1.2 Objects of the Segment Overview – Intended Capacity Lines (ICLs).**

5 Account and Troubleshooting Manual

The European Capacity Management Tool is a complex program which many interacting aspects, this can affect the expected behaviour. The following section details some basic instructions related to account management and requesting support, as well as examples of unexpected behaviour and reasoning and fixes for these cases.

5.1 Contacting ECMT Customer Support

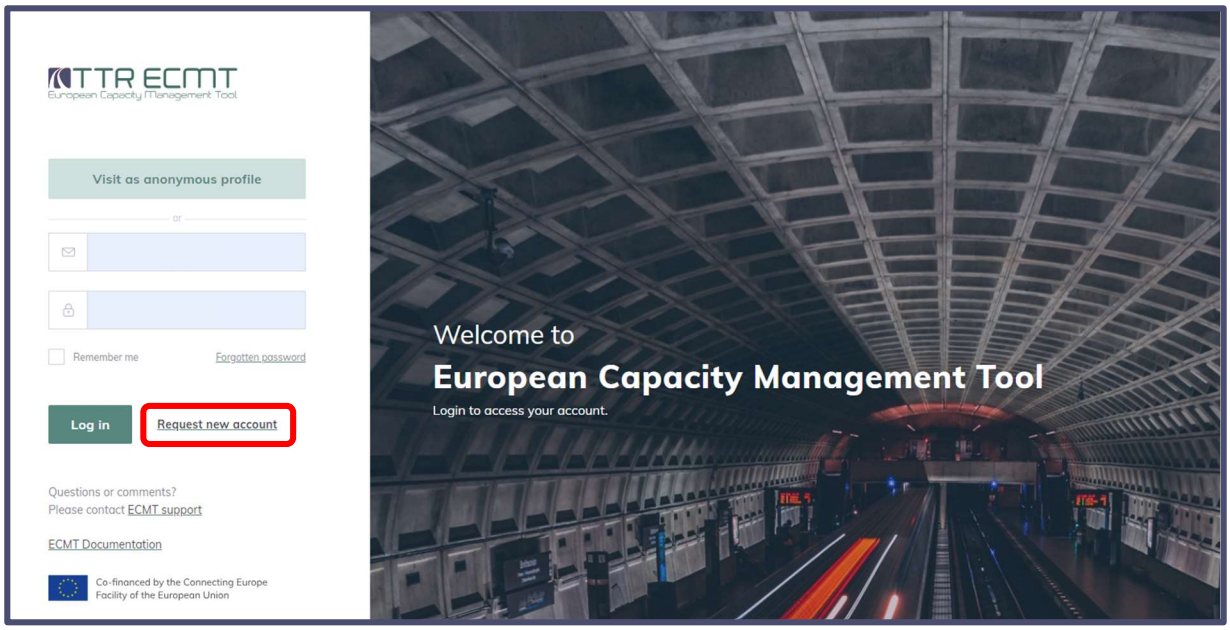
On the TTR ECMT home page, users can contact customer support by clicking the 'ECMT support' link and sending e-mail to: support.ecmt@rne.eu

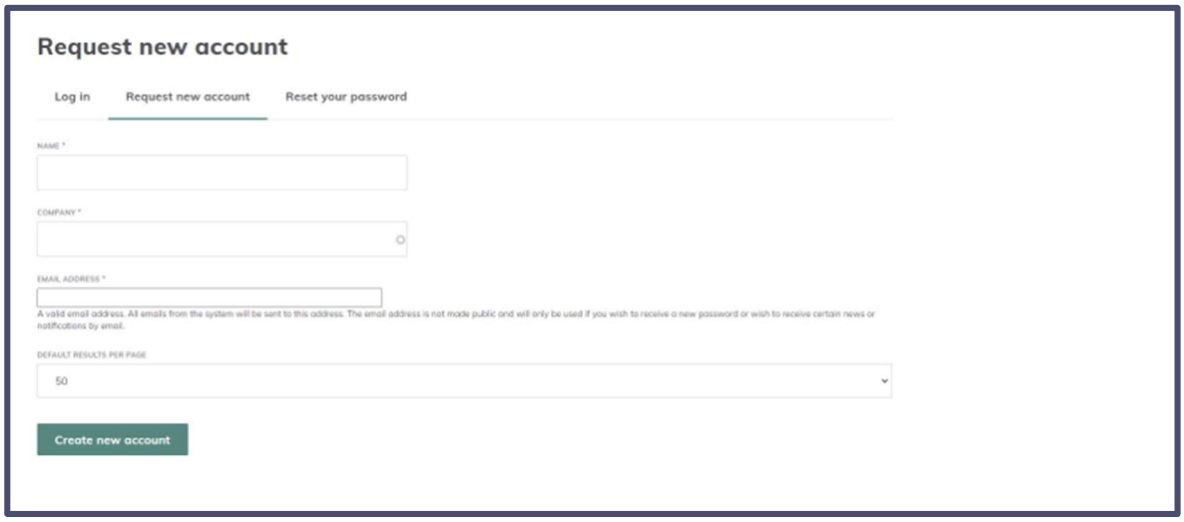


Further information about the ECMT structure, functionalities and constraints can be found under the 'ECMT Documentation' link.

5.2 Account creation

ECMT's login/create account page can be reached through the Rail Net Europe website via this link. A new ECMT account can be requested by selecting 'Request new account' on the ECMT homepage, or by sending an email request to the ECMT support team at support.ecmt@rne.eu

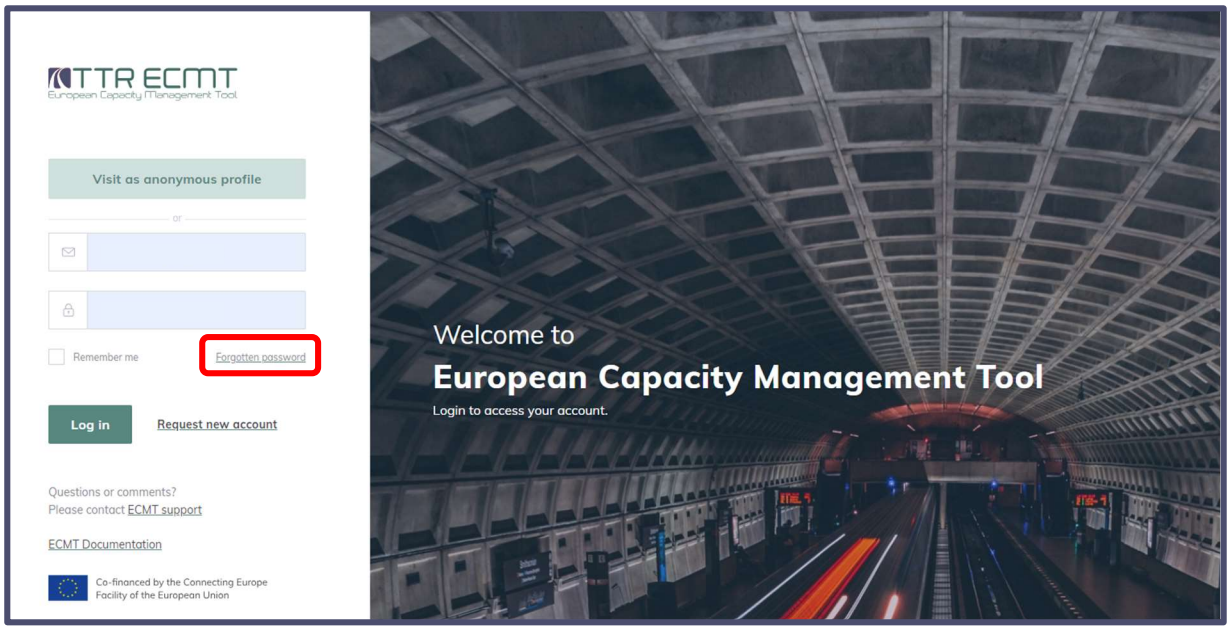




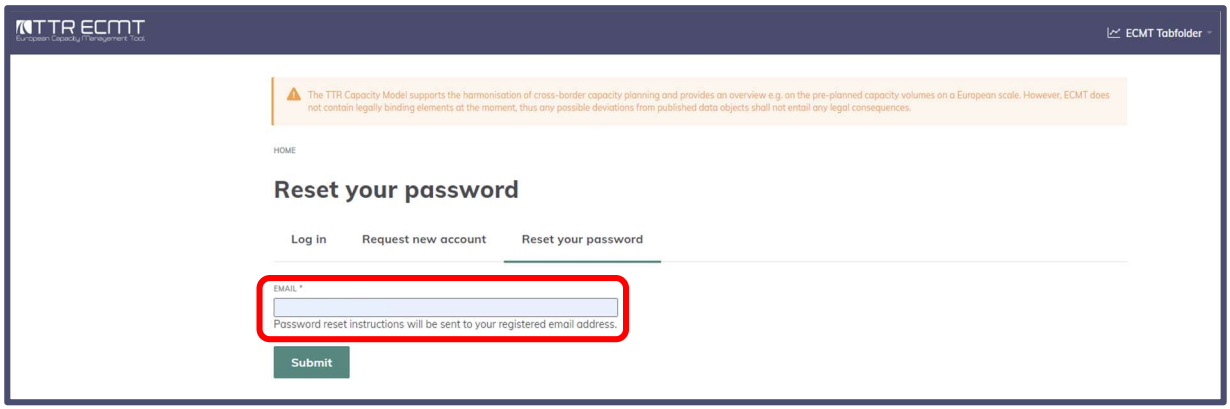
The requests are received by the ECMT support team and, once approved, the requester will receive their login credentials per email.

5.3 Forgotten Log in Details

To recover forgotten login details, the user should select 'Forgotten password' on the ECMT login/create new account page.



The user must provide their e-mail address and submit the request.



An email with instructions for password recovery will arrive in the user's inbox.

5.4 Topology (RIS)

The features and functionalities of ECMT heavily rely on the location data provided by infrastructure managers. This location data provides a comprehensive map of the European railway network made up of geographical points and lines connecting those points. The following chart details these basic data points:

Primary Location Code (PLC)	A geographical point on a railway network defined by longitude, latitude, owner, and validity period. A PLC is identified by its ISO country code followed by the PLC number. PLCs can additionally have a free text name. For example, Vienna Praterstern's PLC name and code is as follows: *Wien Praterstern (in Nw) AT2801*
Segment	A segment is a line connecting two PLCs. A segment can only exist between two neighbouring PLCs and cannot contain any intermediate PLCs. A segment is defined by two PLCs and the distance between them.

Secondary Location Code (SLC)	.Locations on a railway network which are of lesser importance than PLCs – could include ports, depots, shunting yards, etc.

PLCs and segments form the basis of all objects that are created or imported into ECMT. Thus, properly maintained topology data is crucial for the functioning of the tool.

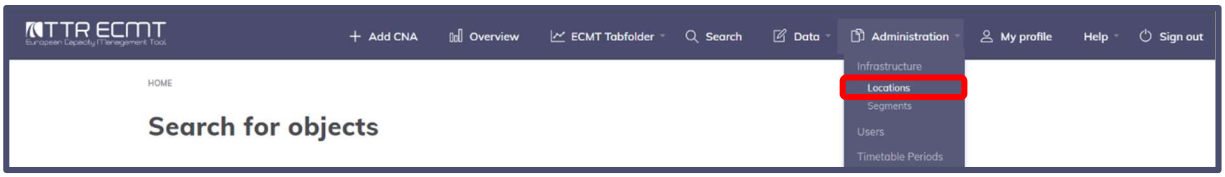
5.4.1 Borders and Cross Territory Rights

All PLCs are national, meaning they are created by and belong to a single IM, and exist on a single IM's territory. As there cannot be a PLC which sits on the border between two IM's territories, border locations are identified through segments.

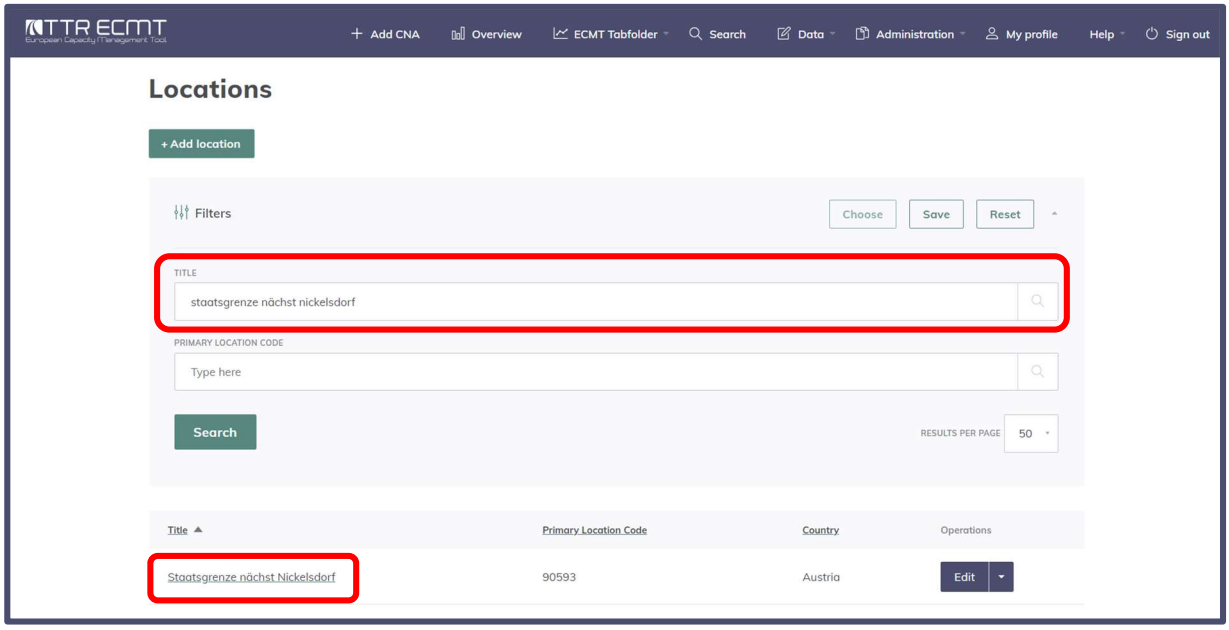
A border segment is a segment whose two neighbouring PLCs belong to different IMs. When conducting CMO harmonisation, the user selects the desired border based on the relevant border section.

It can be the case that for logistical purposes and/or the purpose of CMO harmonisation, IMs will find it necessary to allow neighbouring IMs to construct CMOs on certain PLCs on their territory. This can be achieved through granting cross border territory rights.

To grant cross border territory rights, the user should select 'Locations' from the 'Administration' drop down:

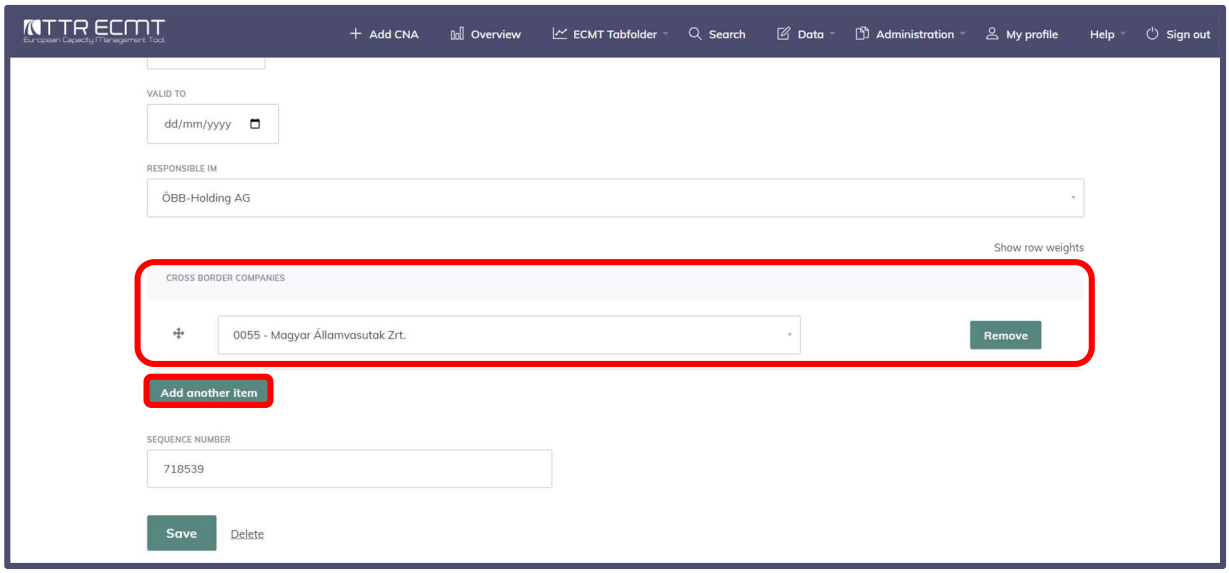


Following this, the user should search for the desired PLC:



Once the user has selected the desired PLC, they will be brought to its details page, where they can view the PLC code, sequence number, country, latitude and longitude, validity, and owner ID. To grant cross border company rights, the user should select 'edit'.

Once on the 'edit page' the user should scroll to the bottom to the table 'Cross Border Companies'. In the following example, the Hungarian Infrastructure Manager MÁV already has the right to create objects using this PLC. To grant another IM cross border rights, the user would select 'Add another item'



5.4.2 Railway Infrastructure System (RIS)

Rail Net Europe, in conjunction with Infrastructure Managers provides the railway Infrastructure System (RIS) for creating, maintaining, and visualising the railway infrastructure data that ECMT relies on. The primary database behind RIS is the Central Reference File Database (CRD).

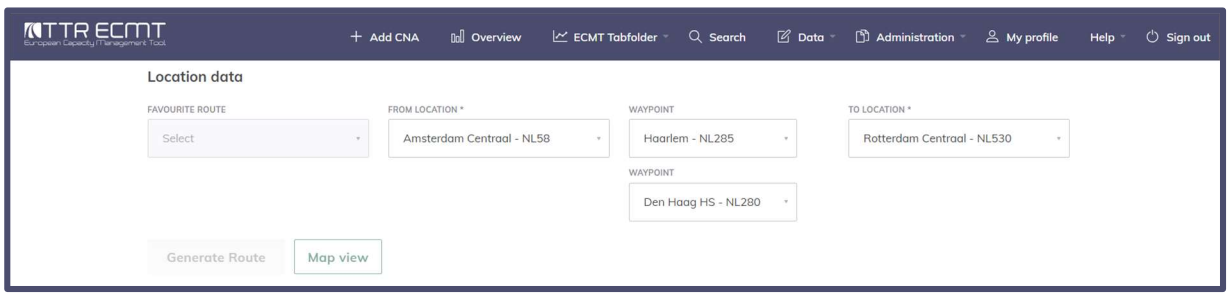
For help or information on create, edit, or delete railway infrastructure data, users should refer to RIS Support (support.ris@rne.eu) or reference the RIS information page on RNE's website (https://rne.eu/it/rne-applications/ris/what-is-ris/) The RIS application itself can be reached via this link, and an account can be requested via this form.

5.5 Object not Appearing in Overviews

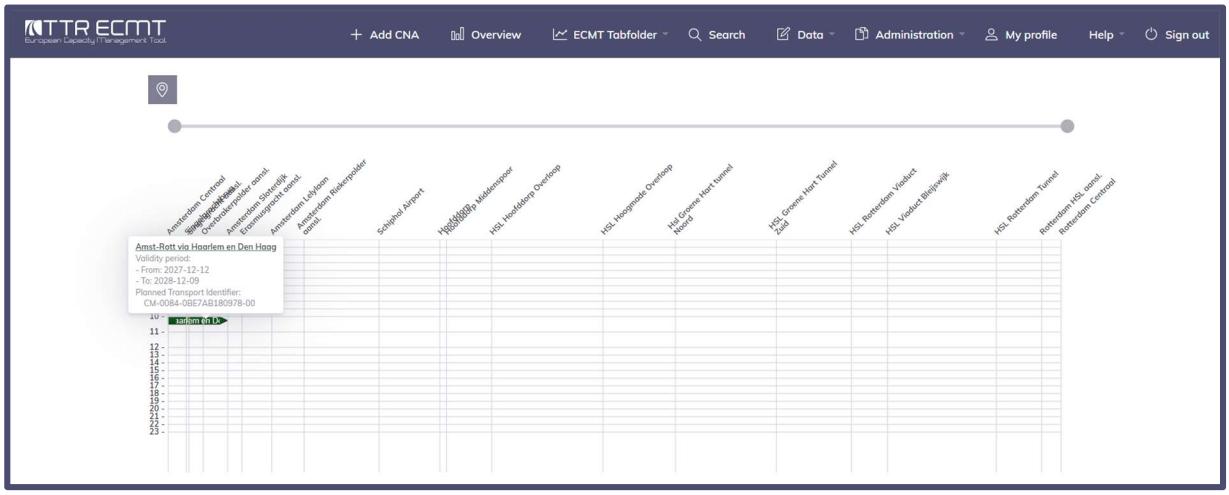
There are several reasons why an expected object, such as CMOs and TCRs may not appear as expected in the segment or line overviews or appear only partially.

5.5.1 Capacity Model Objects

When a Capacity Model object does not appear on a line or segment overview, the reason is most often related to the route. In the following example, the user belongs to the Dutch Infrastructure Manager ProRail, and has just created a CMO for a train travelling between Amsterdam Centraal and Rotterdam Centraal via Haarlem and Den Haag Hollands Spoor stations:

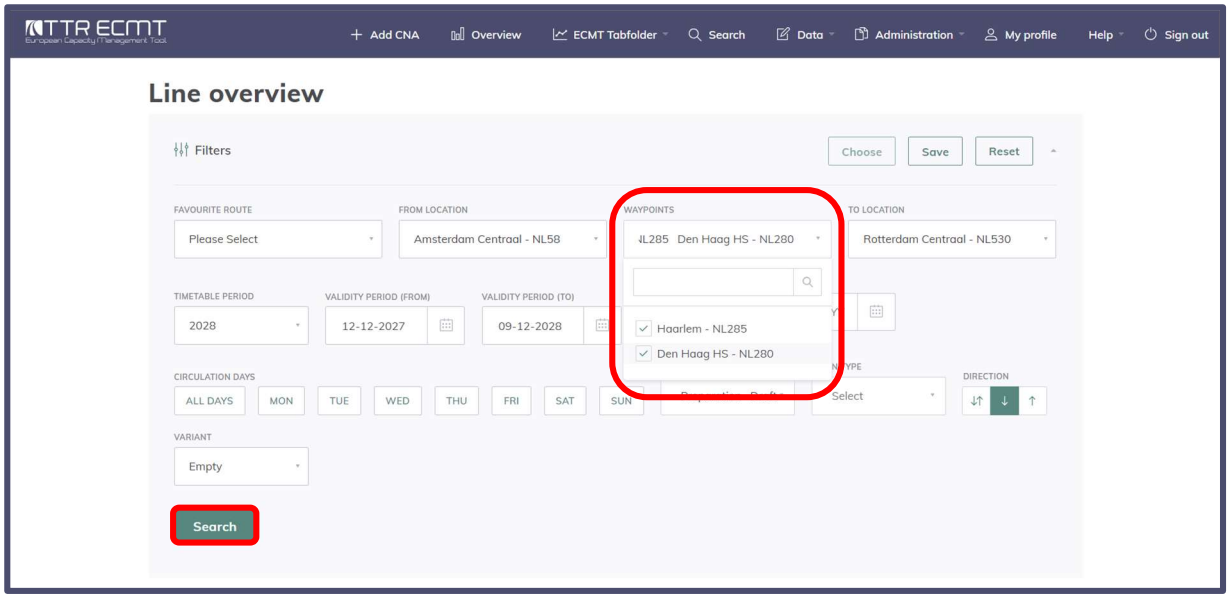


Upon creating this CMO, the user may wish to view the CMO in the line overview in order to see how it will interact with other CMOs. However, when the user opens the line overview and selects the origin and destination as Amsterdam Centraal and Rotterdam Centraal respectively, the CMO appears to only exist between Amsterdam Centraal and Amsterdam Sloterdijk.

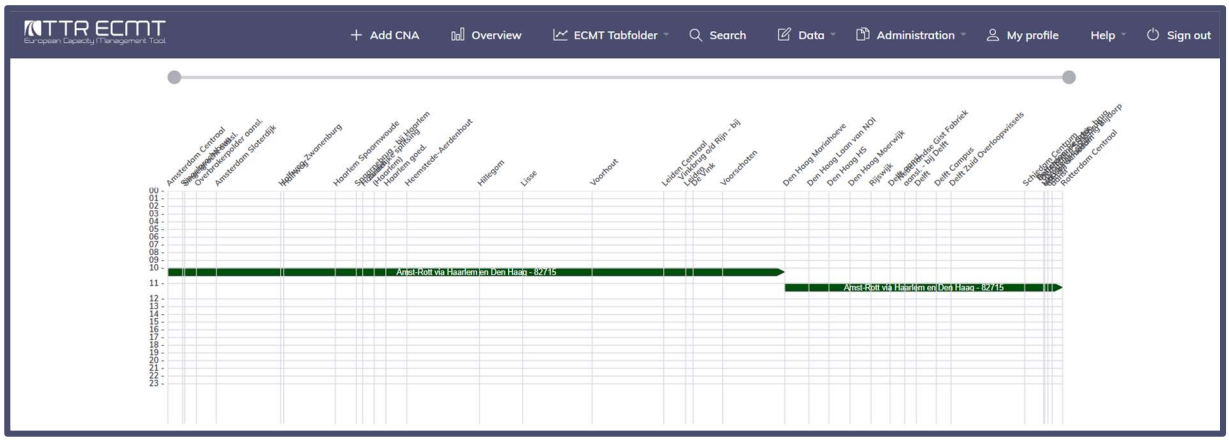


The reason for this is because when generating the line overview, ECMT generates the shortest possible route as a default. In this case, the shortest route between the origin and destination is via the high speed line (HSL). The line that the CMO takes diverges at (shortly before) Amsterdam Sloterdijk, and heads west before turning south towards Rotterdam, making it a longer route.

To see the full CMO, the user should set waypoints in the filter page for the line overview and select 'Search':



Upon searching with the adjusted parameters, the CMO will appear for the full length of the line overview:

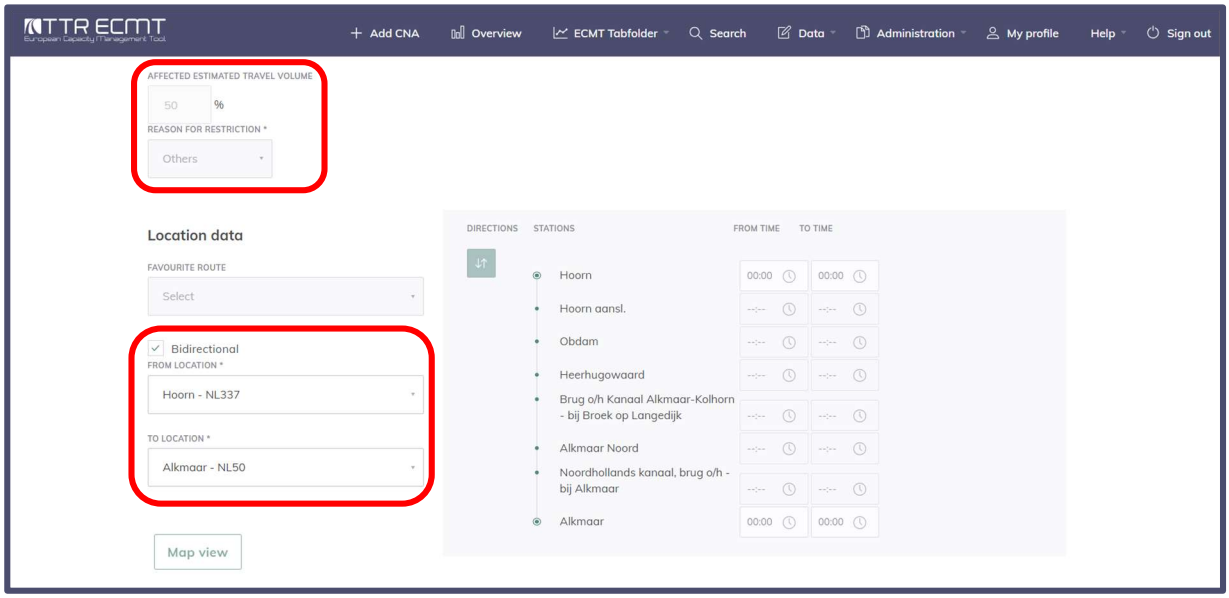


This situation can also occur in the Segment Overview, however, it can be harder to detect as the user will not even be able to partially see the CMO. For this reason, the user should be aware of the route that the CMO takes and how it might differ from the shortest possible route, or that it could potentially deviate from the shortest route for a short section. The user can cross check using the map view on RIS to confirm the topological make-up of the route.

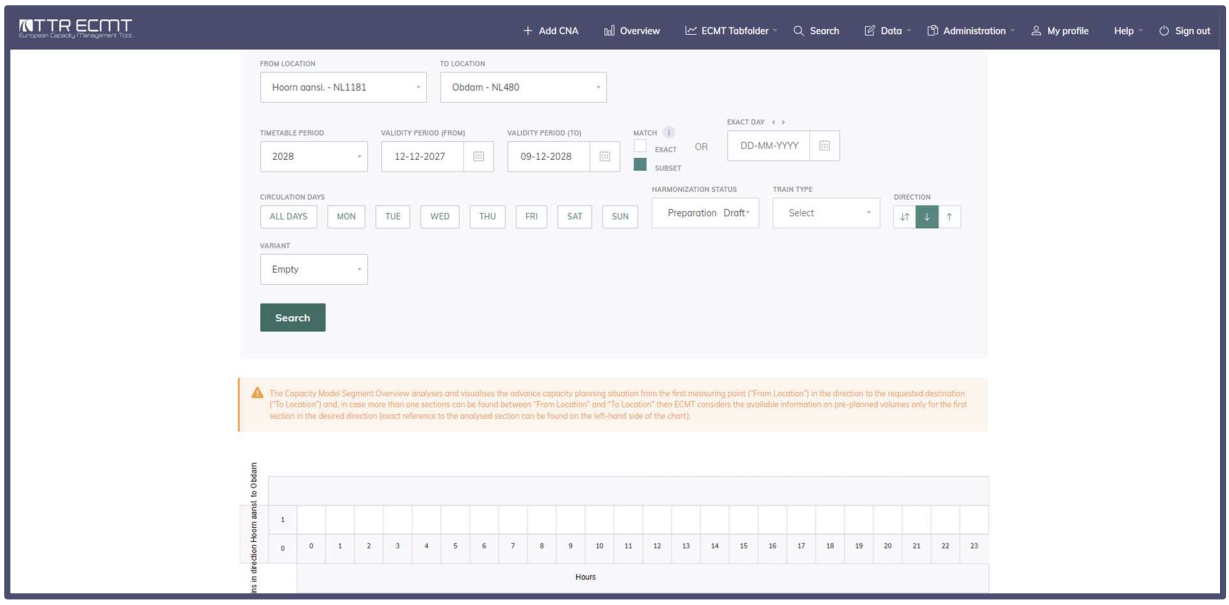
In the above example, if the user had generated a Segment Overview between *Hsl Groene Hart Tunnel Noord* and *Hsl Groene Hart Tunnel Zuid*, they would not have seen their CMO at all, and would have had to instead searched for a segment on the actual route.

5.5.2 Temporary Capacity Restrictions

It is quite common for TCRs to not show up where they are expected to. The reason for this is most often because there is no Intended Capacity Line (ICL) set for the line or segment in question. In the following example, the user has imported a TCR which exists between Hoorn and Alkmaar, resulting in a 50% affect on traffic volume:

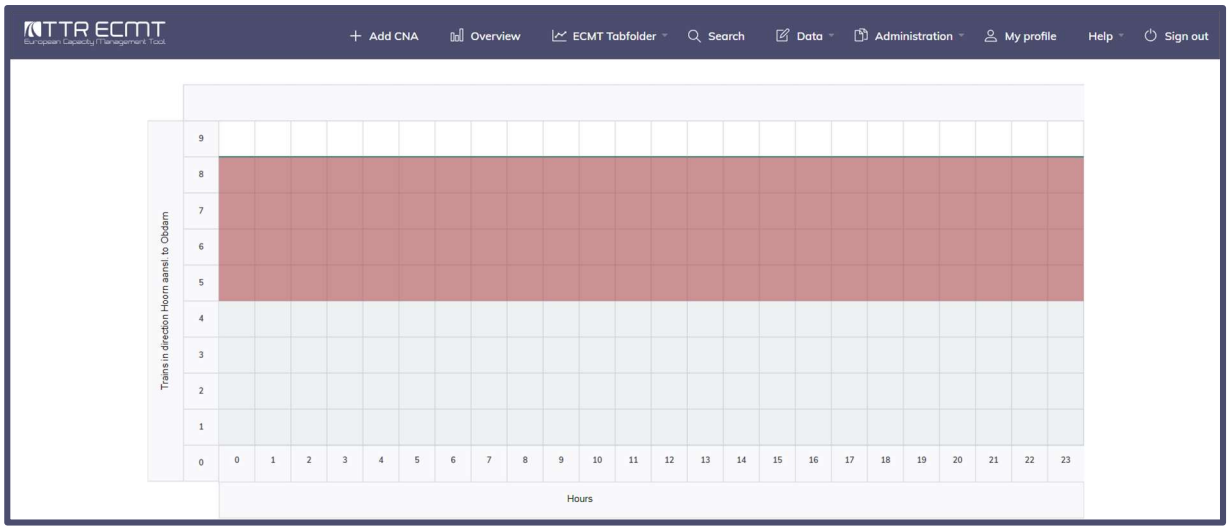


However, when the user generates a Segment Overview between two PLCs on the line in question, there is no data shown:



There are no CMOs on this section, and since the TCR does not appear, the Segment overview generates with only one row and no data. The reason for the lack of TCR is because the IM has not set an ICL for this line. For instructions on manually creating or importing an ICL, see section 3.1 (ICL Object Creation).

In the following visual, the user has set an ICL of 8 capacities per hour. Now, when the user again generates the segment overview between *Hoorn aansl*. and *Obdam*, they will see the ICL set at 8 capacities, and the TCR taking up half of the volume below it:



Annex A – Train Activity Code List

0001 - Commercial stop RU Board/disembark passenger train, load/unload freight train
0002 - Operational stop IM Stops needed by the IM (e.g. overpassing by another train)
0003 - Service stop RU/IM Stops which are used for non-commercial activities (e.g. boarding of staff)
0004 - System stop RU/IM allowing the RU to change a system (e.g. signalling system
0005 - Reversing stop RU/IM stop to enable train unit to run in the opposite direction (without change of engine)
0006 - Stops for reversing move or driver change ends RU stop to enable train unit to run in the opposite direction (with using another engine at the other end of the train and change of driver)
0007 - Stops for locomotive to run round train RU stop to enable train unit to run in the opposite direction (with using the same engine at the other end of the train)
0008 - Technical check/inspection coaches/wagons RU/IM e.g. at origin or intermediate station: brake test, checking load
0009 - Change gauge RU/IM continuation on a network with a different gauge with change of bogies or adaptation of the axles (F->E, SVE->FI)
0010 - attach engine/unit RU Unit not previously in service</option>
0011 - detach engine/unit RU Unit no longer in service
0012 - change engine RU
0013 - attach coach/wagon RU
0014 - detach coach/wagon RU
0015 - attach and detach coach/wagon RU
0016 - attach train Operational Train (in service)
0017 - split train Operational Train (in service)
0018 - Parking of vehicle RU e.g. need to park the train/composition midway for several hours
0019 - Mail/parcel services RU
0020 - shunting RU actual activity of shunting
0021 - shunting service RU Request for shunting service (if offered by the IM or a third party)
0022 - Terminal service (terminal in the meaning of final destination) RU Request for services at the end of a train run (if offered by the IM or a third party)
0023 - Loco driver change RU
0024 - Loco driver break RU legal issue, e.g. to respect working law
0025 - Crew change RU different to loco driver change as for the change of the crew a platform will be needed
0026 - Custom and passport facilities RU
0027 - Other stop reason (miscellaneous) RU/IM
0028 - Boarding only RU
0029 - Disembarking only RU
0030 - Stop on request RU
0031 - Departure equals to arrival time RU If in some stations only arrival times are published, this activity code may be used to indicate that the train cannot continue before the published arrival time in case of an early arrival.
0032 - Departure after disembarking RU mainly used at the end of train run, train may continue as soon as all passengers have disembarked
0033 - No waiting for connection RU
0034 - Watering RU Indicates the IM that a track with water access will be needed.
0035 - Heating Indicates the IM that a track with heating equipment will be needed.

0036 - Cleaning / disinfecting RU
0037 - Treatment on plants and live animals RU Watering, Foddering, Milking, Spraying, Closing ventilation flaps, Opening ventilation flaps
0038 - Treatment of perishable goods RU Checking the temperature, Re-icing, Heating, Checking the proper functioning of the mechanical refrigeration equipment, Refuelling machinery, Switching machinery on or off
0039 – Administrative operations RU Weighing, Re-forwarding, Submission to phytosanitary inspections
0040 - Run Through (Passing Time) IM
0041 - Photo run-by / Photo-stop
0042 - Train Waiting according to local rules
0043 - Train running with another train RU Where trains have been attached at a previous location on the schedule
0044 - Connecting service to other train RU Association where there is a need to define a relationship between a train and its next service. The same vehicle is used for the next train service. Also called "train-set turnover"
0045 - Connecting service from other train RU Association where there is a need to define a relationship between a train and its previous service. The same vehicle is reused from the previous train service.
0046 - Connecting service to other train.
0047 - Connecting service from other train
0048 - Linkage of OTNs belonging to the same transport if no TrainID is present

Annex B – Glossary

Allocation Body (AB)	Neutral capacity allocation body for countries with more than one Infrastructure manager (TVS Switzerland & VPE Hungary)
Applicant	General term for any user who does not belong to an IM and has a need to request and use railway capacity (railway undertakings, freight forwarders, combined transport operators, etc)
Capacity Model Object (CMO)	An object which represents one volume of capacity for a specified market segment, used to populate the Capacity Model
Capacity Needs Announcement (CNA)	An object which represents one volume of capacity for a specified market segment, used to populate the Capacity Model
Consultation	Alignment between IMs and applicants
Central Reference File Database (CRD)	A centralised database that stores Location Codes and Company Codes as required by **European regulation**, and makes them available to users. CRD is the database behind the Railway Infrastructure System (RIS)
ECMT	European Capacity Management Tool
Harmonisation	Alignment between infrastructure managers (for example on CMOs)
ICL	Intended Capacity Line
IM	Infrastructure Manager
PCS	Path Coordination System, RNE IT tool used for the timetabling phase of the TTR process
Railway Infrastructure System (RIS)	RNE Tool for visualising and editing infrastructure data (PLCs, SLCs, and Segments)
Railway Undertaking (RU)	An applicant who conducts the actual operation of trains on railway infrastructure
Temporary Capacity Restriction (TCR)	Covers works, possessions, and capacity restrictions. It indicates that the restrictions are planned (no force majeure restrictions) and temporary (capacity will be returned to the same or higher level as before the works began)
Timetable Redesign for Smart Capacity Management (TTR)	A sector-led initiative aimed at improving the usage of railway infrastructure through a redesign of the processes for timetabling and capacity management. TTR is designed to facilitate harmonised planning between European countries and to leverage modern information technology.