Implementation Plan

-

Update December 2023

Funded by the European Union

“RFC North Sea – Med is co-financed by the European Union's CEF. The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein”

Version Control

Version	Chapter changed	Changes
14/09/2023	Review 1 Permanent team	- Based on the last final version published: Update December 2020
12/10/2023	Review 2 Management Board for review by Executive Board	- Input and remarks received from the Management Board - No remarks received from the Executive Board
26/10/2023	Review 3 Draft for Stakeholder Consultation	-
		-
		-

Table of Contents

1. Introduction

The Management Board of Rail Freight Corridor (RFC) North Sea-Mediterranean (abbreviated North Sea-Med) is consulting the applicants on this draft update of the Implementation Plan. This document is periodically updated, following its first submission to the Executive Board in 2013.

RFC North Sea-Med was established in November 2013 and over the past 10 years was extended several times.

The last update of the Implementation Plan dates from December 2020 when the UK withdrew of the European Union and Network Rail and Eurotunnel left the RFC. Following this withdrawal, the corridor ends in Calais.

This 2023 update of the IP is not related to any change in routing and is a regular update.

This new version is a consultation version and is foreseen to be approved by the Executive Board on the 14th of December 2023.

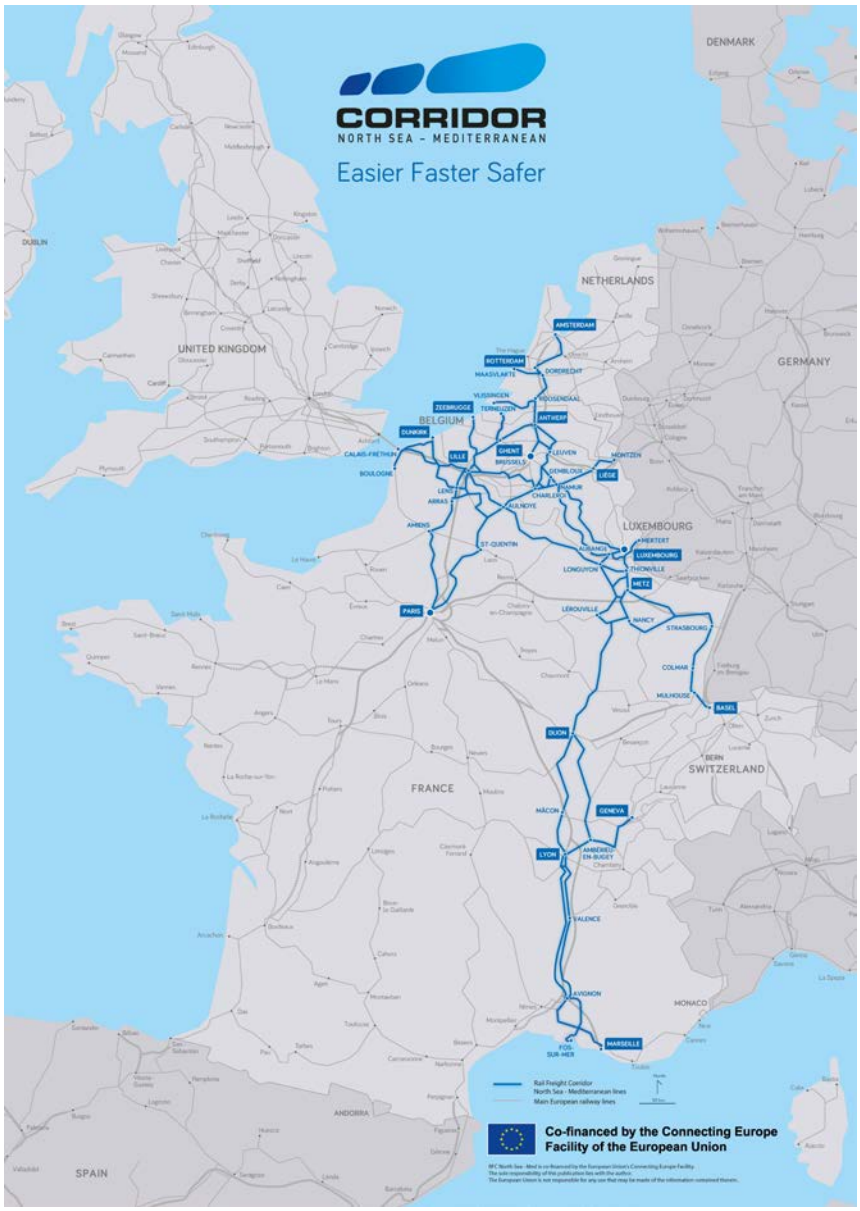
2. Corridor Description

2.1 Key Parameters of Corridor Lines

All information on the routing of the corridor can be found in the corridor information platform.

2.1.1 Routes and Lines

RFC North Sea-Mediterranean is the continuation of the former ERTMS Corridor C, as all Corridor C lines still belong to this RFC.



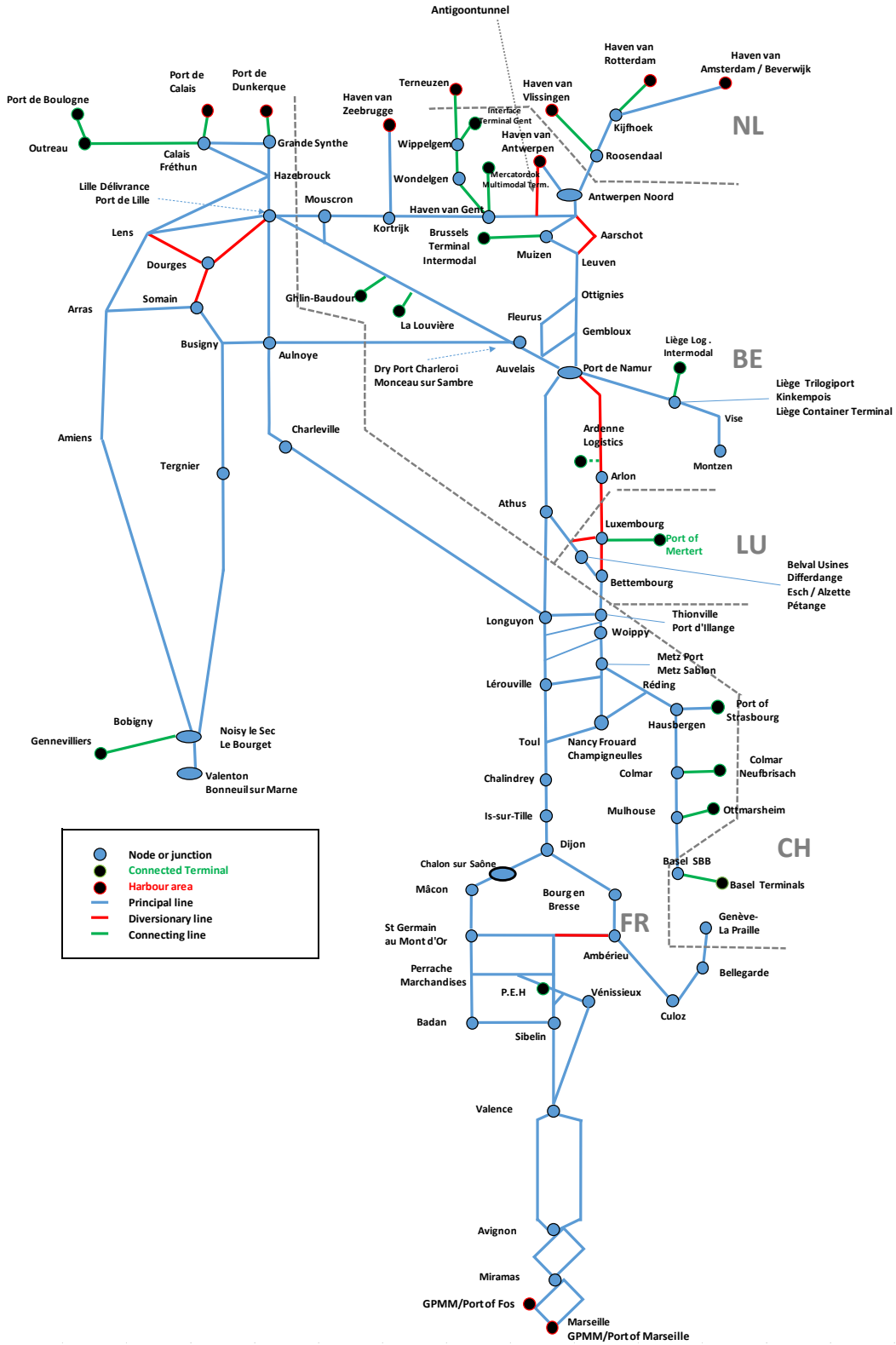
The designated RFC North Sea-Mediterranean lines can be split into four different categories:

- **Principal lines**, on which Pre-arranged Paths (PaPs) are offered
- **Diversionary lines**, on which PaPs may be considered
- **Expected lines,** which are lines that are either planned in the future or under construction but not yet completed, or which are existing lines planned to become a corridor line in the future
- **Connecting lines**, which are lines connecting a terminal to a principal or a diversionary line and where there is no obligation for PaP supply.

The table below presents the breakdown of RFC North Sea-Mediterranean lines by country. This breakdown is based on the length of principal and diversionary lines, excluding the length of the connecting lines.

Country	***Length of lines since January 2021 (in km)***
Netherlands	***306***
Belgium	***1081***
France	***3486***
Luxembourg	***87***
Switzerland	***19***
Whole Corridor	***4959***

Breakdown of RFC North Sea-Mediterranean lines by country



Map of the categories of lines of the Corridor

2.1.2 Number of tracks

The following map shows the sections with two or more tracks and the ones with a single track (in red).

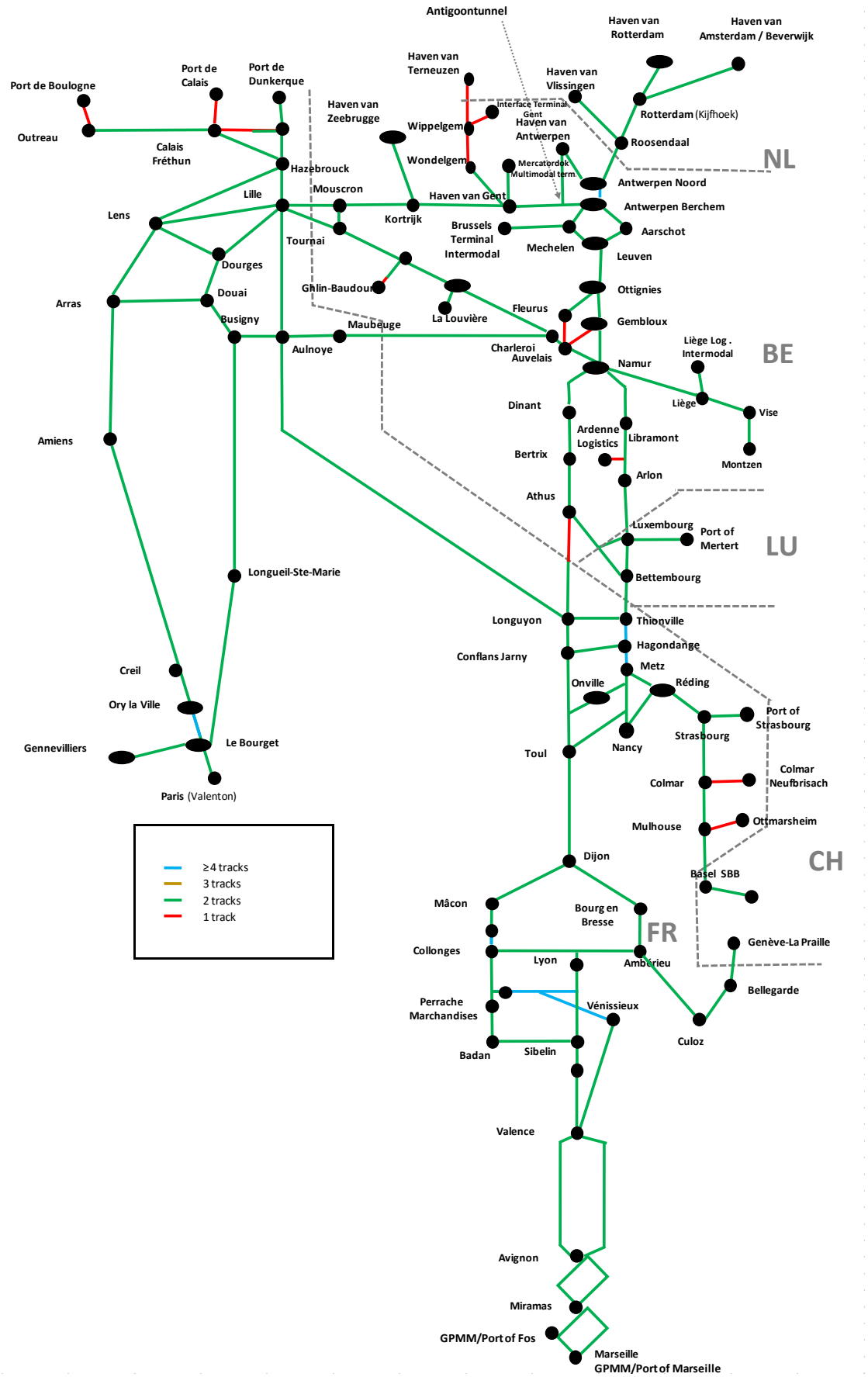
All sections in the Netherlands (except the stretch between the Dutch/Belgian border and Terneuzen) and Switzerland have two tracks or more.

Belgium has several single-track sections: a section between Fleurus and Auvelais, one between Jemeppe-sur-Sambre and Gembloux, one South of Aubange, the line between Wondelgem and the Belgian/Dutch border as well as a small connecting stretch to Ardenne Logistics.

In Luxembourg, almost all lines are double-track except for some short sections:

- Luxembourg-Wasserbillig/Mertert-Port (mostly double track but some single track)
- Pétange - Rodange-Frontière (Athus) (single track)
- Pétange - Rodange-Frontière (Aubange) (single track)
- Pétange - Rodange-Frontière (Mont St Martin) (single track).

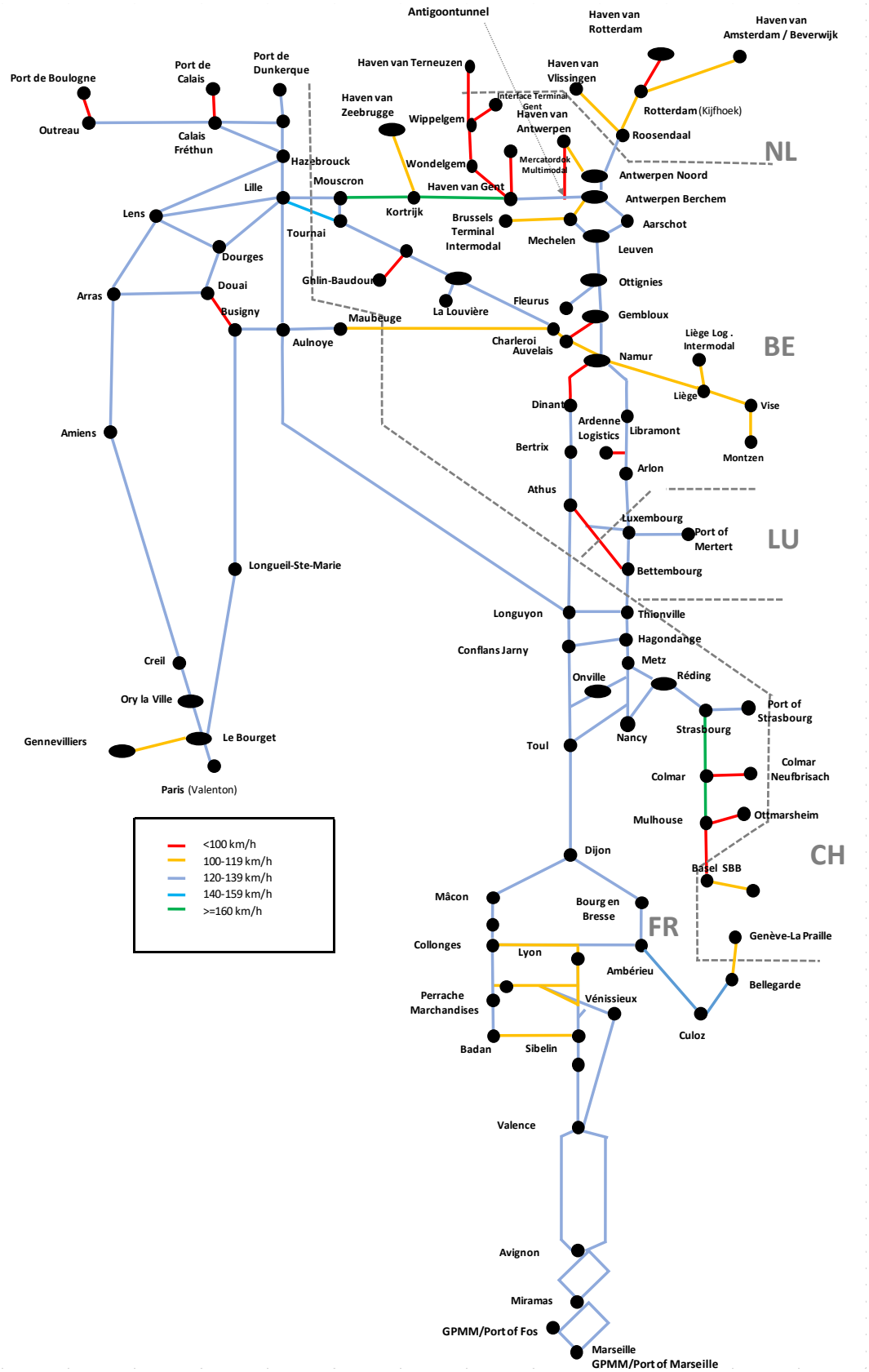
France has one short single-track line in the Lyon node, two single track connecting lines in Alsace and some single-track lines in the vicinity of the ports of Calais and Boulogne.



Number of tracks on the Corridor (Sep-2023)

2.1.3 Speed limits

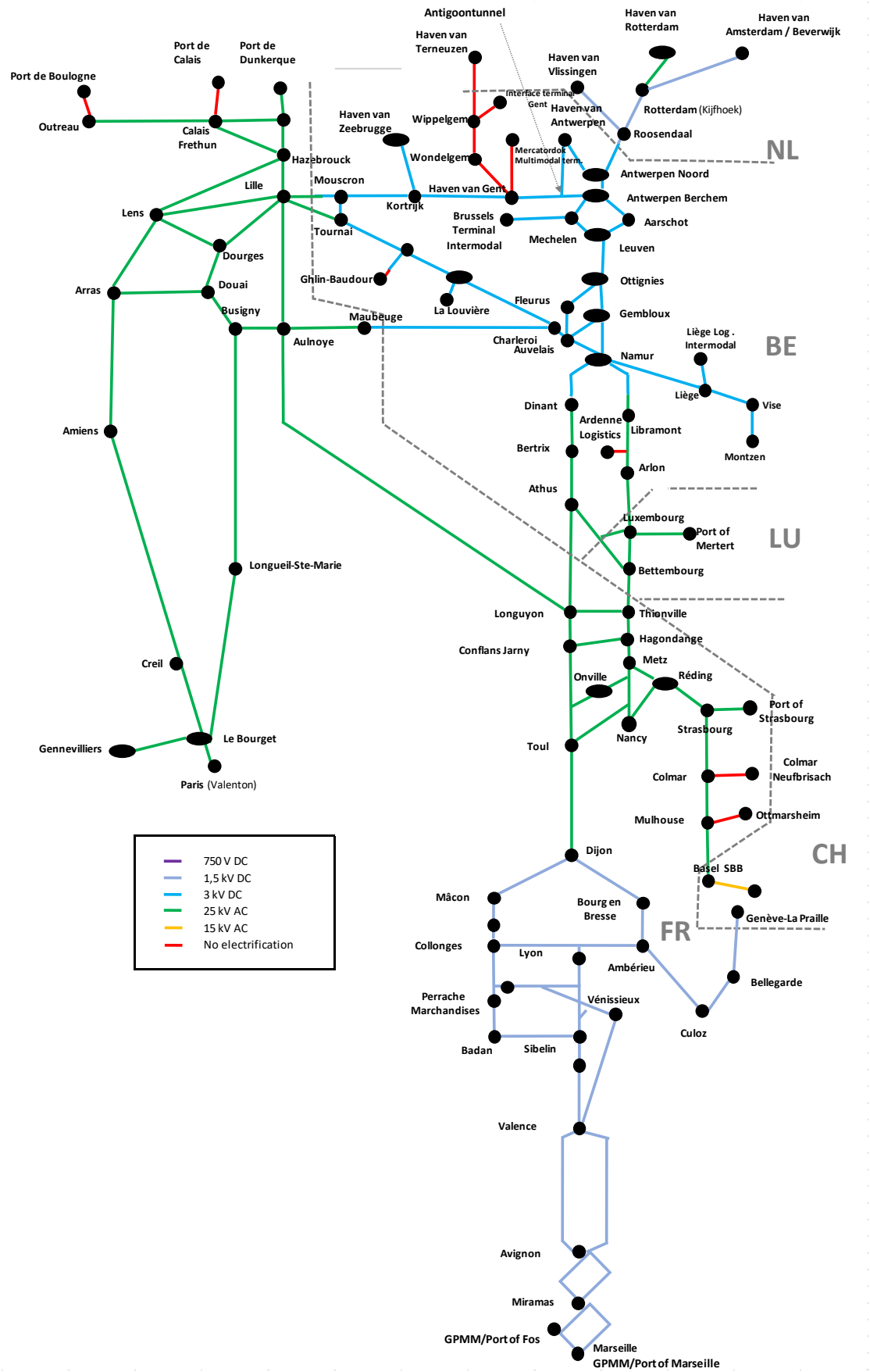
The following map provides an overview on the speed limits on the corridor lines.



Speed limitation on the corridor (Sep-2023)

2.1.4 Electrical systems

All principal and diversionary lines of the corridor are electrified. They comply with the TEN-T core network standard which allows: 25 kV AC, 50 Hz; 3 kV DC; 15 kV AC, 16.7 Hz; 1.5 kV DC, 750V DC.



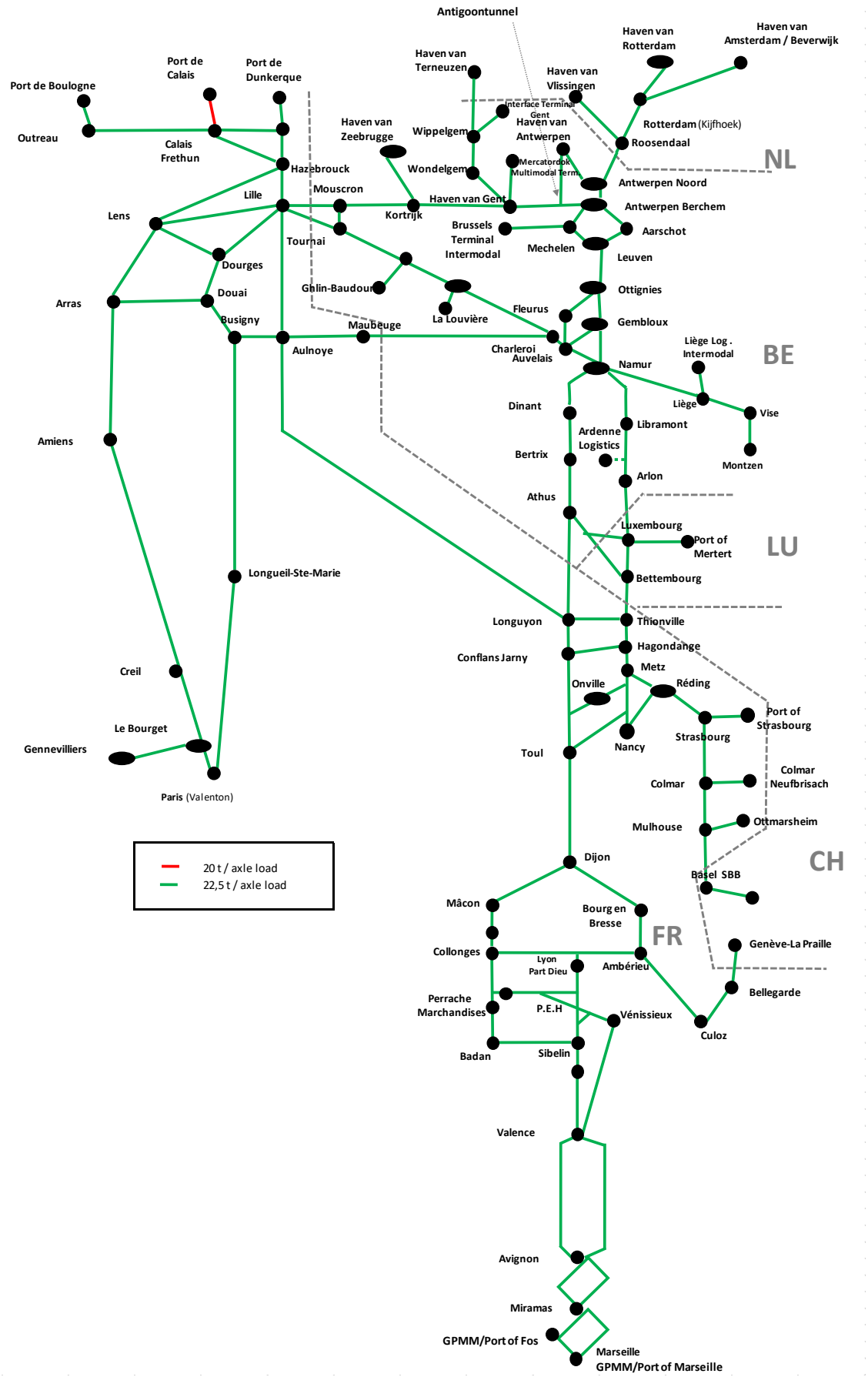
Electrical systems on the corridor (Sep-2023)

2.1.5 Signalling systems

ERTMS is progressively being deployed on the RFC North Sea – Mediterranean lines. Section 6.3.3 about the interoperable systems presents in detail the planning of the ETCS deployment.

2.1.6 Maximum axle load

According to the TEN-T standards, the axle load on the core network should be at least 22.5 ton per axle. All RFC North Sea-Mediterranean lines (with the exception of the small section to the Port of Calais) comply with this standard.



Map of maximum axle load (Sep-2023)

2.1.7 Train length

The standard train length is expected to be set at 740m (700m without locomotives).

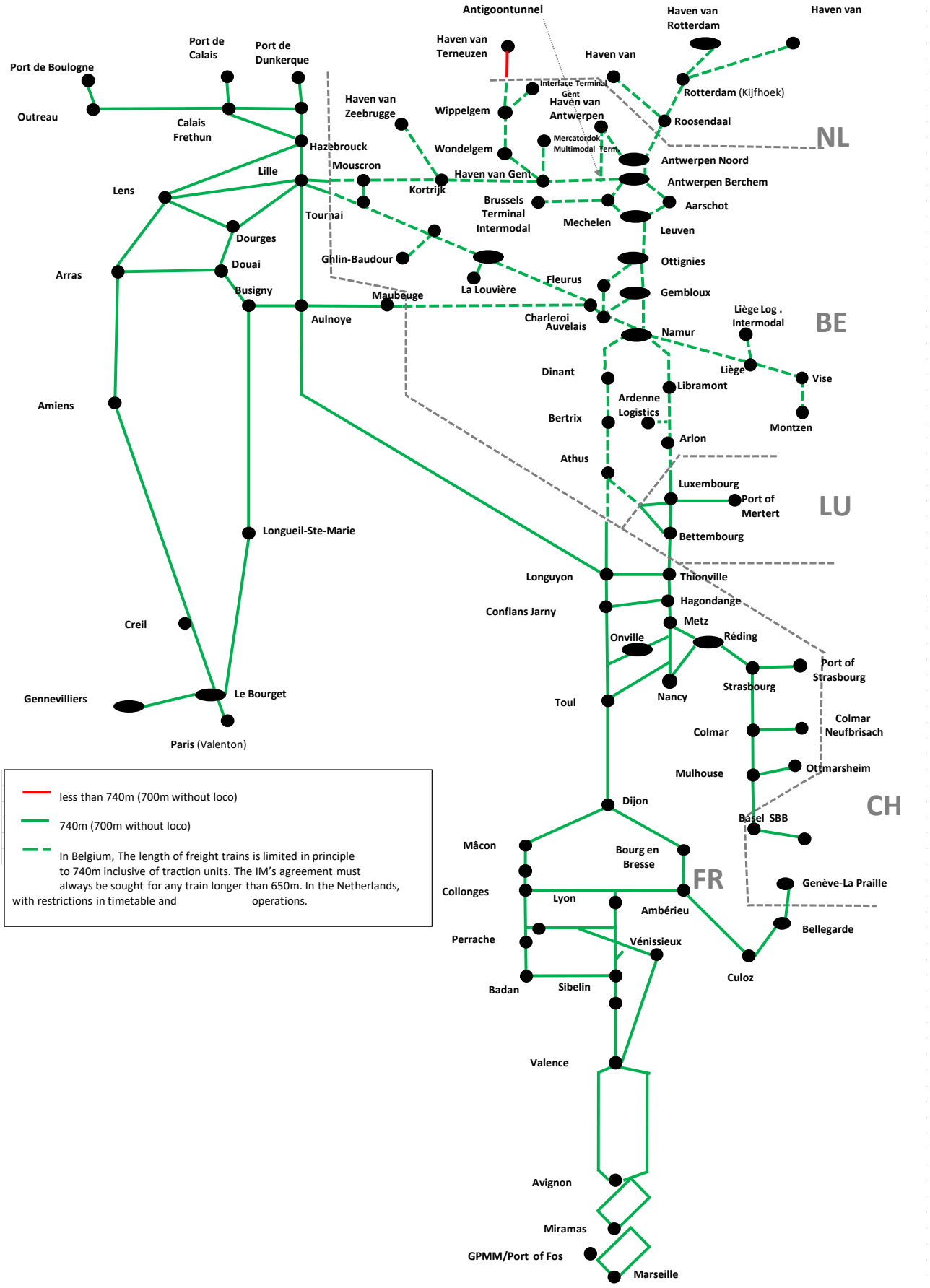
In Belgium, 740m trains can run, but for trains longer than 650m prior agreement is needed as stipulated in Infrabel's Network Statement "*The length of freight trains is limited in principle to 750m inclusive of traction units. The IM's agreement must always be sought for any train longer than 650m*".(see 6.1.2 for more detailed information).

The Netherlands, Luxembourg, Switzerland and France fully meet the TEN-T standard.

In France, on the following sections:

- Bettembourg – Le Boulou
- Dunkirk – Lorraine
- Dijon – Marseille
- North of France – Valenton

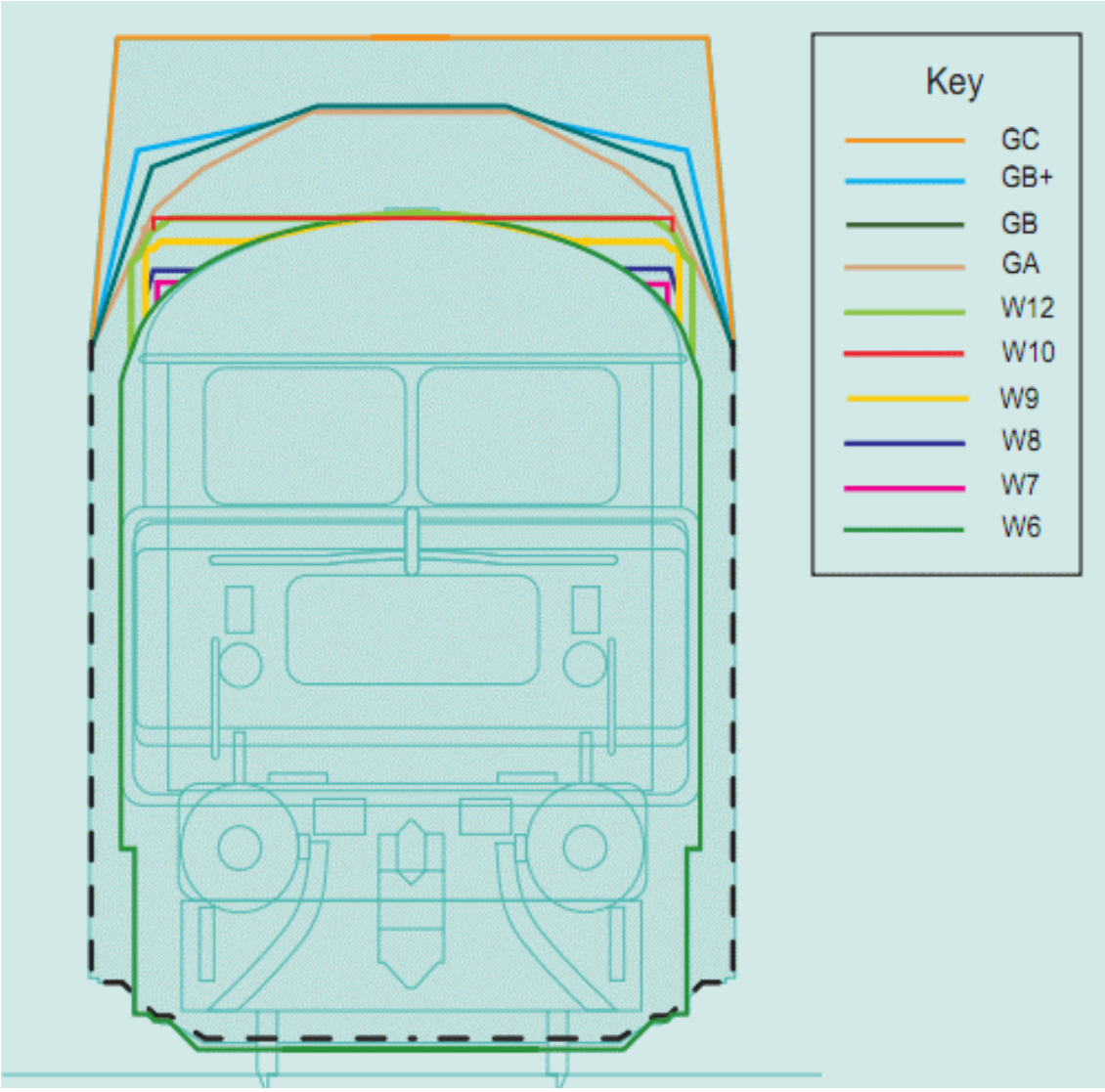
trains on the rolling highway and combined transport trains with "high-performance" wagons are allowed to run with a length of 850 meters.

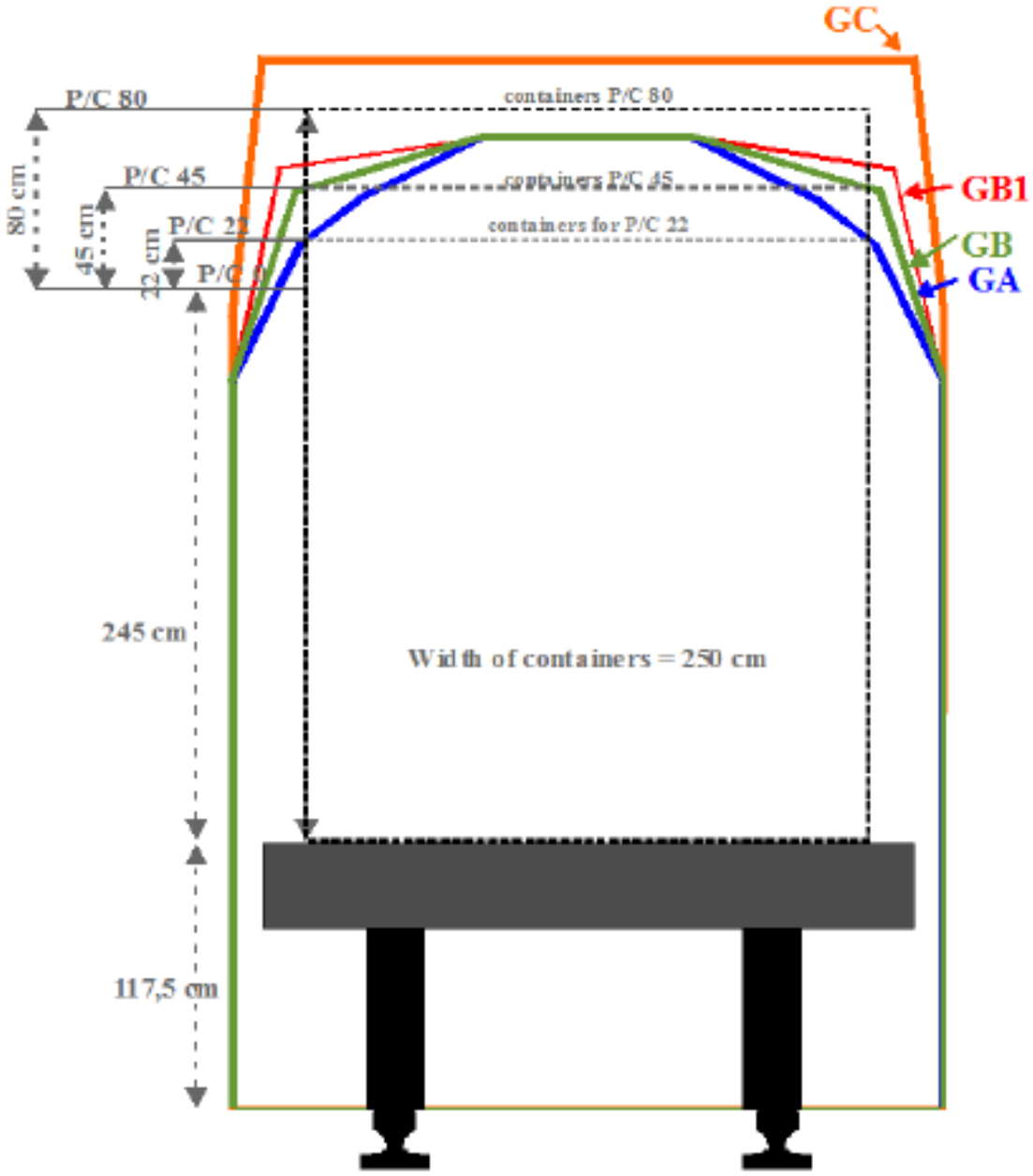


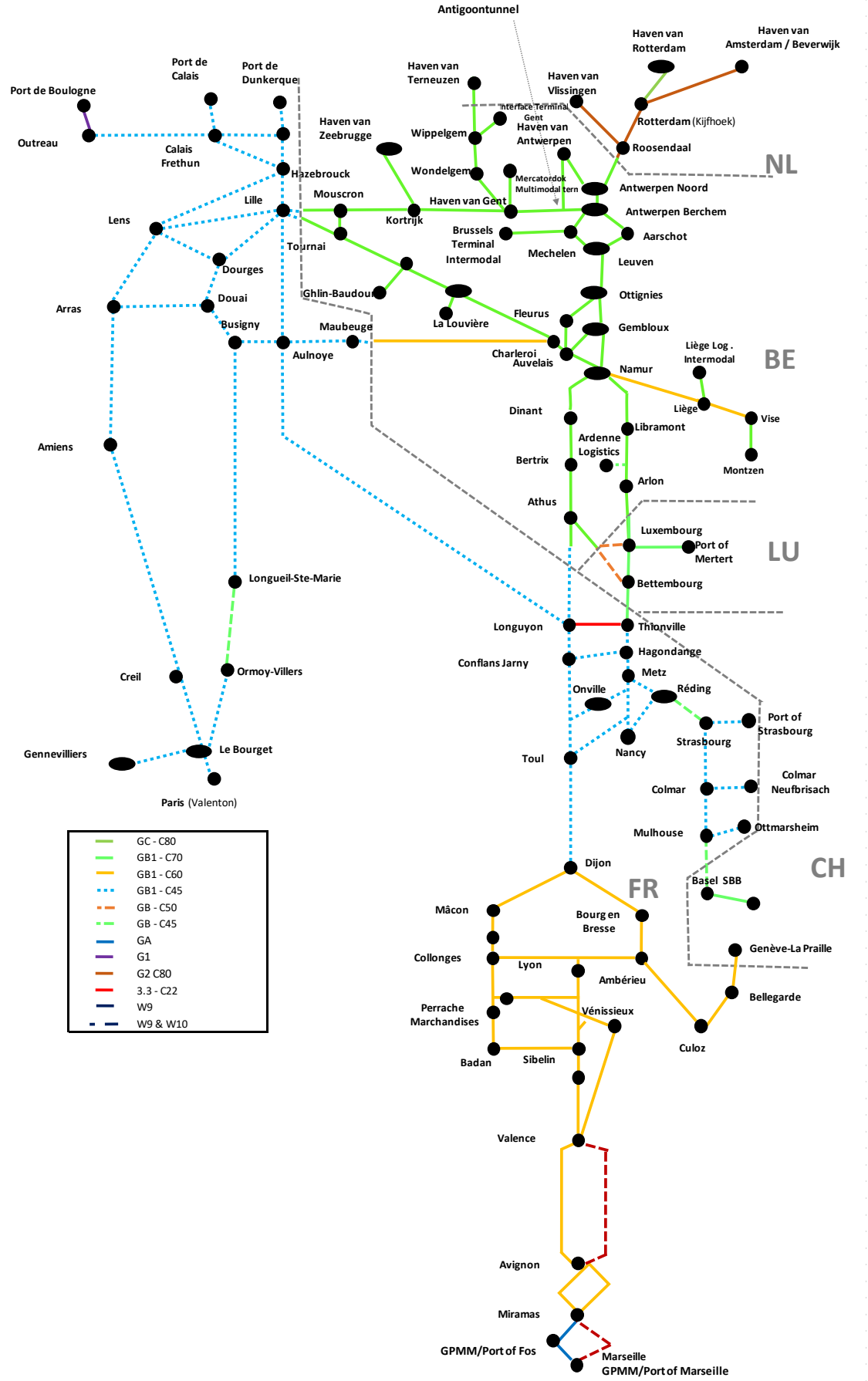
Maximum train length (Sep-2023)

2.1.8 Loading Gauges

There is currently no TEN-T core network standard requirement for loading gauge. However, available loading gauge can be a criterion for railway undertakings to choose between two routes. The loading gauge is different whether conventional freight trains or combined transport freight trains are considered. The following figures indicate the technical characteristics of loading gauge, and the specification per corridor section. In addition, a baseline for the infrastructure gauge enabling the train run of 4-meter semi-trailers loaded on pocket wagons (LGP 400) has been defined by SNCF Réseau and will allow to run most of the traffic with semi-trailers P400.




GC
P/C 80
containers P/C 80
P/C 45
containers P/C 45
GB1
P/C 22
containers for P/C 22
GB
GA
80 cm
45 cm
22 cm
245 cm
Width of containers = 250 cm
117,5 cm



Loading gauge (Sep-2023)

2.1.9 Gradients

To meet most of the railway undertakings' expectations to use only one loco for one train, the gradient shall not exceed 12.5‰.

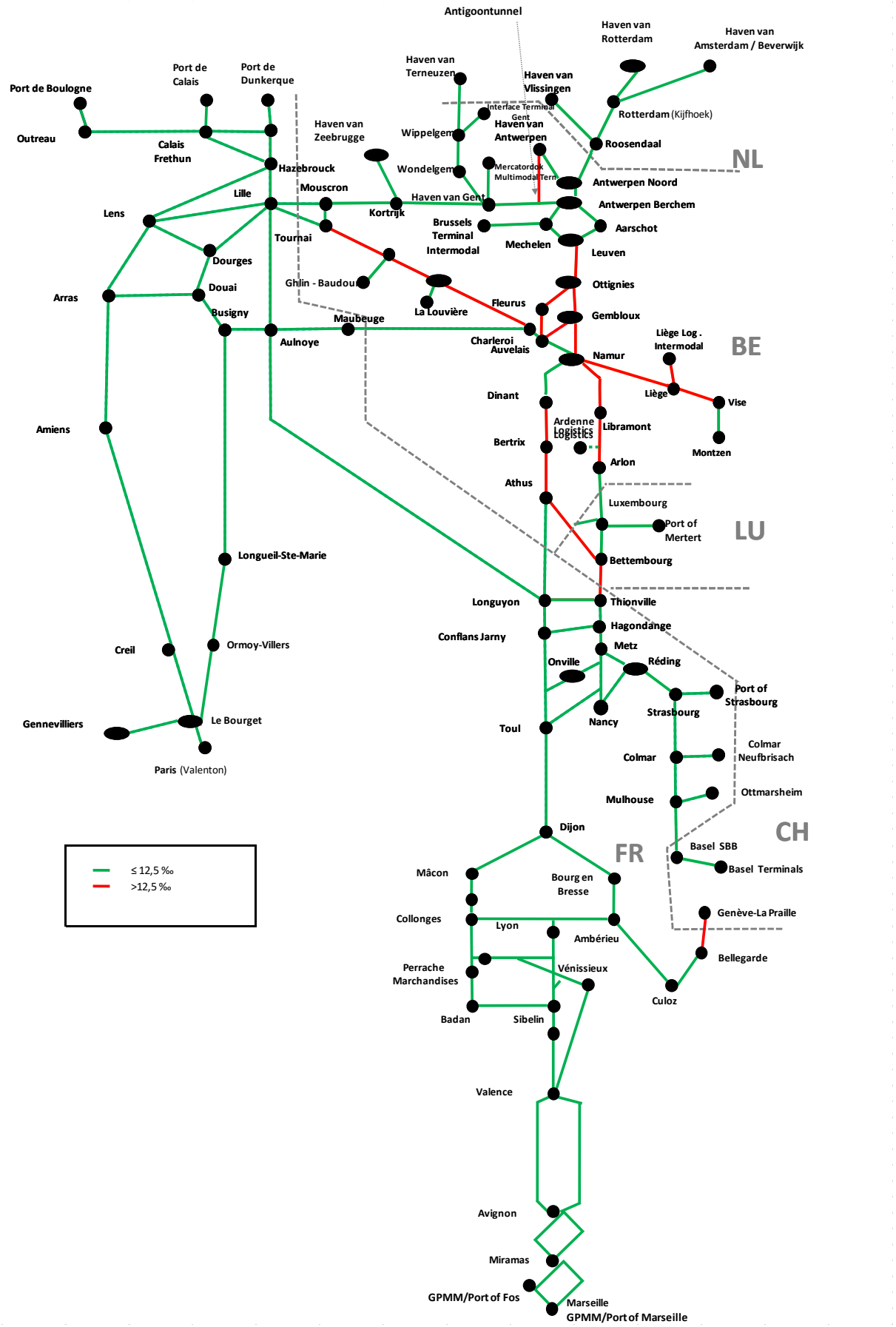
The Netherlands fully meets the standard.

Switzerland meets the standards except on the section La Plaine – Genève La Praille.

France meets the standard on all lines, except between Bellegarde and the Swiss border.

Luxembourg meets the expectation on the section between Kleinbettingen/Autelbas and Luxembourg and on the section between Belval-Usines and Bettembourg. All other corridor lines in Luxembourg have a gradient of 14‰ or 15‰. For the sections Luxembourg and Bettembourg, and Pétange and Belval-Usines, which have a higher gradient then 14‰ or 15‰.

In Belgium, there are only 40% of the sections, which meet railway undertakings expectations.



Gradients (Sep-2023)

2.1.10 Connections with Other Corridors

2.1.10.1 Connection points with other Corridors

Several important freight routes are partly on RFC North Sea-Mediterranean and partly on another corridor. For example, a lot of trains run from Antwerp to Italy through Luxembourg, France and Switzerland.

RFC North Sea-Mediterranean is connected to five other rail freight corridors:

- In Amsterdam, Rotterdam, Antwerp, Ghent, Zeebrugge, Mechelen, Montzen and Basel with Corridor Rhine-Alpine;
- In Strasbourg, Metz and Paris with the Atlantic Corridor;
- Between Lyon and Marseille, and in Ambérieu with the Mediterranean Corridor;
- In Rotterdam and Antwerp and the rail sections between Antwerp and Roosendaal, in Amsterdam, and Montzen with Corridor North Sea-Baltic
- In Strasbourg with Corridor Rhine-Danube.

Exact information on routing on all adjacent corridors can be found via the multicorridor view of the corridor information platform.

2.1.10.2 Contiguous Traffic Flows with other Corridors

As RFC North Sea – Mediterranean is linked in many locations with other corridors, the importance to act as one network of corridors should not be underestimated. Many traffic flows using at least partly RFC North Sea – Mediterranean lines continue on/come from one or more other corridors. Below a non-exhaustive overview of these traffic flows is provided.

2.1.10.3 RFC Rhine - Alpine

One of the dominant traffic flows using RFC North Sea – Mediterranean lines connects the Benelux region with the north of Italy, using RFC North Sea – Mediterranean and RFC Rhine-Alpine lines. The main connection point for this traffic is Basel.

2.1.10.4 RFC Atlantic

The Benelux region is connected to Spain using RFC North Sea – Mediterranean and Atlantic Corridor lines. The main connection between the two corridors for this traffic is made in Paris.

2.1.10.5 RFC Mediterranean

Various regions in the North or Central France are connected to Italy via Dijon and Modane, using RFC North Sea – Mediterranean and Mediterranean Corridor lines. The connection between the two corridors for this traffic is made in Ambérieu.

2.1.10.6 RFC North Sea - Baltic

Transit traffic through the Netherlands from the Belgian harbours on RFC North Sea - Mediterranean (via Roosendaal and Bad Bentheim) exists, which continue until Eastern Germany, Poland or the Czech Republic using RFC North Sea – Baltic lines.

2.1.10.7 RFC Rhine-Danube

RFC Rhine – Danube was established in 2020, with a connection in Strasbourg.

2.1.10.8 Multiple Corridor Flows

Several traffic flows exist on RFC North Sea – Mediterranean, using at least three corridors. Please find some examples below:

- Sweden – Belgium using RFC North Sea – Mediterranean, North Sea – Baltic and ScanMed lines (via Bad Bentheim and Hamburg).
- Germany – Spain using RFC North Sea – Mediterranean, Atlantic and Mediterranean lines (via Forbach and Lyon).
- Le Havre – Italy using RFC North Sea – Mediterranean, Atlantic and Rhine-Alpine lines (via Metz and Basel).

2.2 Corridor Terminals

In Regulation (EU) 913/2010, terminals are broadly defined. They can be the Infrastructure Managers' marshalling yards and sidings which are necessary for rail system operations like train formation operations. They can also be many other entry points of the various transportation systems in the commercial zone of influence of the corridor:

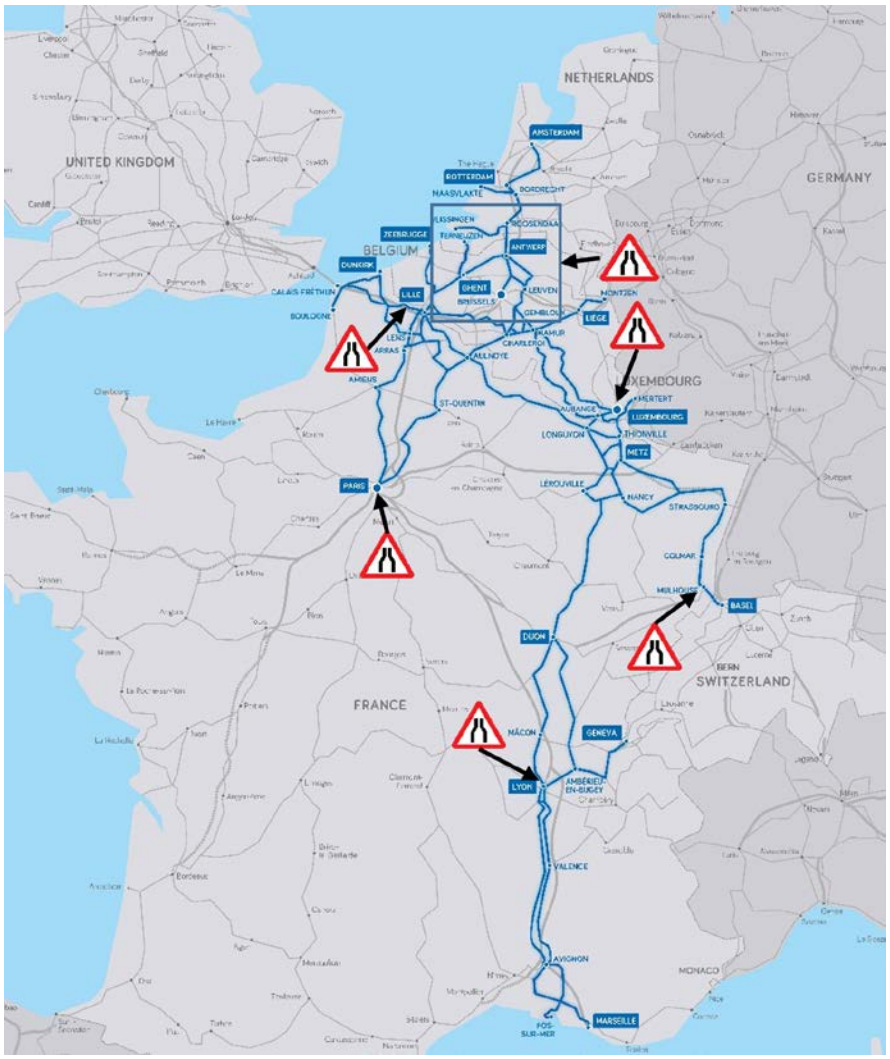
- combined transport terminals;
- river ports;
- multimodal platforms;
- maritime ports;
- private rail freight terminals.

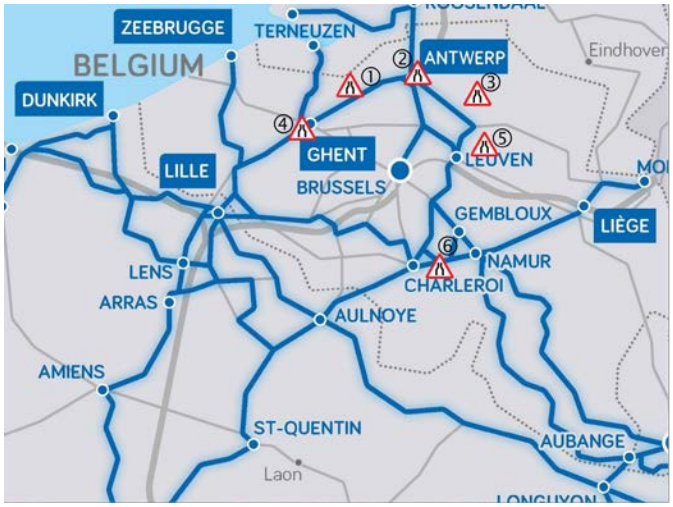
The list of can be found in the Customer information platform (CIP):

2.3 Bottlenecks

RFC North Sea-Mediterranean calls “bottleneck” all rail sections where it has identified a capacity problem or with technical limitations for some type of trains. Typically, this means that it is difficult to elaborate a train path if this path crosses one of these bottlenecks during peak hours.

RFC North Sea-Mediterranean has identified the bottlenecks (⚠) which are highlighted on the general map hereunder, with a zoomed map on the Belgian bottlenecks below:





1. Sint Niklaas – Lokeren – Y. Bernadette
2. Y. Driehoekstraat / Y. Schijn
   Y. Walenhoek / Y. Holland
   Y. Antwerpen Schijnpoort
   Y. Drabstraat
3. Y. Aubry – Lier – Y. Nazareth
4. Gent Dampoort
   Y. West Driehoek Ledeberg
   Y. Noord Driehoek Ledeberg
5. Y. Nazareth - Y. Noord Driehoek Aarschot
   Y. Noord Driehoek Aarschot - Y. Zuid Driehoek Aarschot
   Y Zuid Driehoek Aarschot – Y. Holsbeek
   Y. Leuven-Bundel M
6. Fleurus - Auvelais

Additional information about RFC North Sea-Mediterranean bottlenecks is provided in chapter 6.1.

2.4 RFC Governance

All details can be found in Section 1 of the CID.

3. Transport Market Study

In view of Article 9 of Regulation (EU) 913/2010, the RFC North Sea-Mediterranean Management board has commissioned a consortium of consultant firms to carry out a first Transport Market Study finalised in 2013.

In June 2016, an update has been made (as an addendum) in order to assess the market for international rail freight in the United Kingdom. Since 2016, no updates were done on the Transport Market Study.

The essential elements of these studies have been published and are on the website of RFC North Sea-Mediterranean.
A synthesis can be found on our website, or directly by clicking here.

A TMS update is currently being carried out under the lead of RNE and will be finalised in 2024.

4. List of Measures

Since the Corridor is implemented, the subchapters 4.1 – 4.6 are not applicable for updates. The state of play and further developments regarding concrete measures and procedures is included in Section 4 of the CID.

4.1 Coordination of Planned Temporary Capacity Restrictions

All information on the coordination of planned temporary capacity restrictions can be found in Section 4 of the CID.

4.2 Corridor One Stop Shop

All information on the Corridor One Stop Shop can be found in Section 4, chapter 4.2 of the CID.

4.3 Capacity Allocation Principles

All information on capacity allocation can be found in Section 4, chapter 4.3 of the CID.

4.4 Applicants

All information on applicants can be found in Section 4, chapter 4.3.2 of the CID.

4.5 Traffic Management

All information on traffic management can be found in Section 4, chapter 4.5 of the CID.

4.6 Traffic Management in the Event of Disturbance

All information on traffic management in the event of disturbance can be found in Section 4, chapter 4.5.3 of the CID, including the International Contingency Management.

4.7 Quality Evaluation

4.7.1 Performance Monitoring Report

RFC North Sea-Mediterranean publishes an annual performance report on its website (https://www.rfc-northsea-med.eu/en/page/figures-performance-corridor), and presents these figures during a TAG and RAG meeting, to its customers. This annual publication is foreseen in the first quarter of each year. The report is based on the RNE Guidelines on the Key

Performance Indicators of the Rail Freight Corridors: https://rne.eu/downloads/#downloads_corridor .

More information on KPI and objectives can be found in chapter 5.

4.8 Corridor Information Document

The Corridor Information Document (CID), which consists of 4 sections and this implementation plan as an annex, is published every year in January. It is also published in a tool called Network and Corridor Information (NCI) portal. Access to the NCI portal is free of charge and without user registration. For accessing the application, as well as for further information, use the following link: http://nci.rne.eu/.

5. Objectives / Performance

The performance on RFC North Sea – Mediterranean is evaluated via a set of KPIs commonly applicable to all RFCs, described below in the chapter 5.5.
For some of these common KPI's, the corridor has defined its own objectives.

Recommendations for using these commonly applicable KPI's are described in the Guidelines for Key Performance Indicators of Rail Freight Corridors. Related information can be found on the flowing link:
https://rne.eu/wp-content/uploads/2022/10/Guidelines_KPIs_of_RFCs_V4.0.pdf.

5.1 Train Performance Management: a corridor oriented performance scheme

Through its Train Performance Management working group, RFC North Sea-Med provides a platform for coordination and cooperation among the IMs, the RUs and the terminals.

This working group defines the processes for monitoring and improving train performance along the RFC, by improving punctuality across borders and handover points and improving the quality of data provision.

A "Quality Circle Operations" was launched to closely monitor the traffic of freight trains between the Terminals of Lyon and Bettembourg, with the aim of improving the quality of the operations and punctualityat departure and arrival of the concerned freight trains.

All information concerning the Train Performance Management project on RFC North Sea-Mediterranean can be found in the CID Section 4 chapter 4.6.

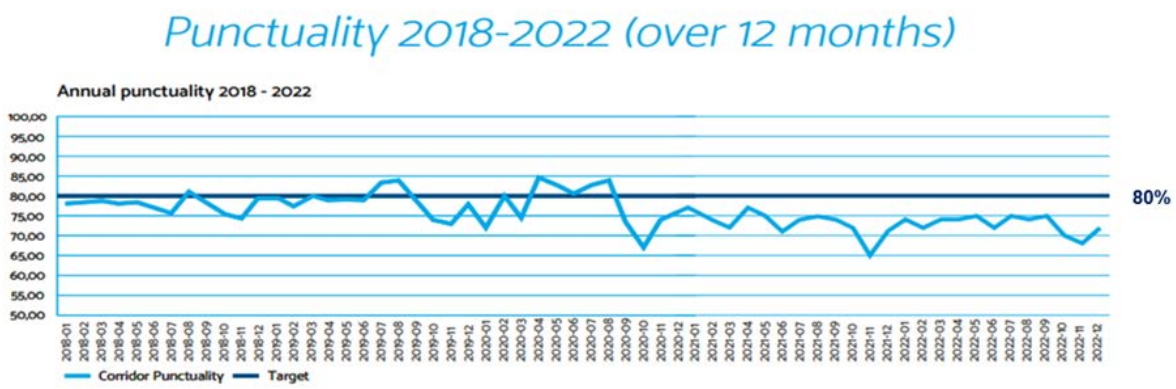
5.2 Punctuality Objectives

It is the goal of the RFC North Sea-Mediterranean to improve punctuality on the Corridor.

The punctuality calculation is based on the Train Information System (TIS) data at 31 defined measuring points.

RFC North Sea-Mediterranean set a goal of 80% punctuality and continues its efforts to reach this objective via different methods: the Train Performance Management (TPM), an improved harmonisation and resilience of the PaP Catalogue and the removal of traffic bottlenecks.

The setup of the yearly PaP catalogue can help to improve punctuality by implementing specific procedures on harmonisation at border points. Furthermore, an improvement in punctuality can be achieved by insisting on realistic train paths. With these three strategies, RFC North Sea-Mediterranean intends to contribute to the improvement of punctuality on problematic Corridor sections and passing points.



RFC North Sea – Med continues its efforts to reach the objective of 80% punctuality over the next years.

5.3 Capacity & Allocation Objectives

Capacity on RFC North Sea-Mediterranean is measured mainly in three different fields: trains running on the corridor lines, the number of PaPs offered, and the average running time on the main corridor sections. Also, regarding the allocation process, the requests and allocation of PaPs and volume of the Reserve Capacity offered by the C-OSS.

5.3.1 Trains running on the Corridor

The total volume of Corridor trains is measured. All trains crossing at least one corridor border on the Corridor are taken into account[1]. This means that not only trains running on PaPs are considered. The evolution of the total amount of corridor traffic is heavily influenced by the economic growth of the corridor region. However, the corridor aims to increase the amount of corridor trains in the following manner, compared to the year 2013, taking into account a low economic growth:

2013	2022	2030
Base 100	+ 3%	**+ 9%**

The target was reached in 2022 and the foreseen target in 2030 is kept.

5.3.2 Strategy for the number of Pre-arranged Paths

Each year, around X-18, the RFC North Sea-Mediterranean C-OSS, together with the other RFCs, organises a client survey (“Capacity Wishes Survey”) to have a better view on the quantity of PaPs needed for the next PaP catalogue. Based on the outcome of this survey, the Management board makes a preliminary decision about a PaP strategy (as far as quantity

[1] A new calculation method was voted by the RNE General Assembly (https://rne.eu/corridor-management/rfc-kpis/)

is concerned) based on a proposal from the C-OSS. For this proposal, other parameters are also taken into account:

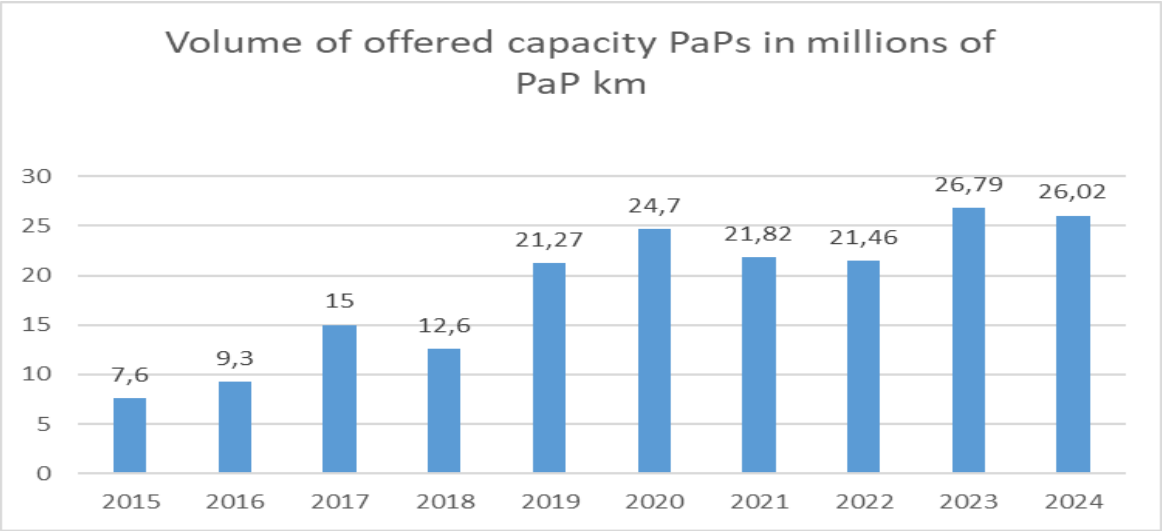
- *offer previous timetable*
- *quantity of allocated PaPs of previous timetable*
- *total of allocated paths of previous timetable*
- *total of used paths of previous timetable*
- *transport market study interpretation*
- *capacity needs survey*
- *capacity availability and strategy IM (capacity model).*

This proposal is then presented to the Executive board and the Advisory Groups, and adapted according to their input when it is deemed relevant by the Managing board.

At first, the PaP catalogue consisted largely of paths reflecting historic market demand. RFC North Sea-Mediterranean is extending this offer gradually with a number of PaPs designed for the development of new traffics. These paths are published on top of the amount of market demand paths for two reasons. The Corridor offers more flexibility to the market in number of paths and alternative routes, and it anticipates on possible extra traffics and promotes the use of under exploited lines and trajectories.

It is the objective of the RFC North Sea-Mediterranean to offer a complete PaP offer (at X-11) on all Corridor principal lines and to increase the share of requests for international freight paths along corridor lines, that go via the C-OSS, from around 10%, to at least 50% by 2025 (compared to the concerned timetable year).

The table below gives an overview on the capacity offered as PaP in the RFC North Sea-Mediterranean catalogues from timetable (TT) 2015 to 2024 and an objective for TT2025. Because of the maximisation of the capacity offered for TT2021, which meant that in principle all harmonised international paths were published as a PaP.



Objective is for TT 2025 a maximisation: 100% of the pre-constructed paths crossing a corridor border are PaPs.

5.3.3 Planned Average Speed

The goal of RFC North Sea-Mediterranean is to be a fast, efficient and high quality rail link. This objective means increasing the efficiency and reliability of end-to-end rail freight traffic, thereby strengthening the railway's competitive position, in line with European freight transport targets. Therefore it is vital to continue the optimisation of harmonisation of train paths between the different IMs and ABs.

The follow-up on the average speed is monitored. The objective is based on the following parameters:

- *preview of works*
- *preview of infrastructure investments*
- *the evolution of the path journey time in the past catalogue*
- *the evolution of the timetable journey time*

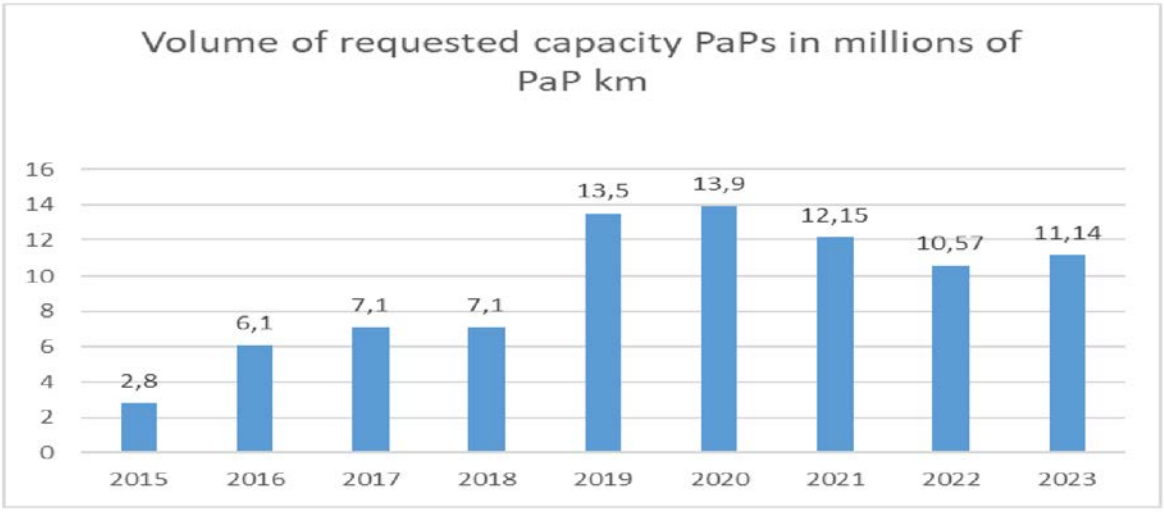
Taking into account these parameters, the Corridor has defined the following objectives concerning the published PaPs:

KM/h per Corridor Route								
Route including	Length Km	Catalogue TT 2013	Catalogue TT 2019	Catalogue TT 2020	Catalogue TT 2021	Catalogue TT 2022	Catalogue TT 2023	Catalogue TT 2024
Antwerp - Basel	748,8	57	52,2	55,1	54,4	55,7	59,4	61,2
Antwerp - Bettembourg	343,7	60,7	57,8	57,4	54,9	56,0	57,4	57,8
Antwerp - Uckange via Artère Nord Est	395,1	n.a.	n.a.	n.a.	n.a.	n.a.	63,1	64,8
Rotterdam-Antwerp	74,3	53,4	64,6	64,1	64,1	62,59	64,8	62,8
Metz - Lyon	454,1	n.a.	69,2	65,3	66,5	62	71,5	67,6
Dunkerque - Liège	311,1	n.a.	55,1	58,7	58,7	59,2	52,7	58,7
Antwerp - Paris	403,7	n.a.	n.a.	n.a.	n.a.	n.a.	43,2	39,2
Mont St. Martin - Basel	425,9		46,4	50,5	51,9	52	n.a.	n.a.
Antwerp - Lille	125,4		51,4	49,2	61,9	47,8	n.a.	n.a.
Lille - Paris	247,3		69,2	68,5	70,7	57,3	n.a.	n.a.

Average Speed Objectives

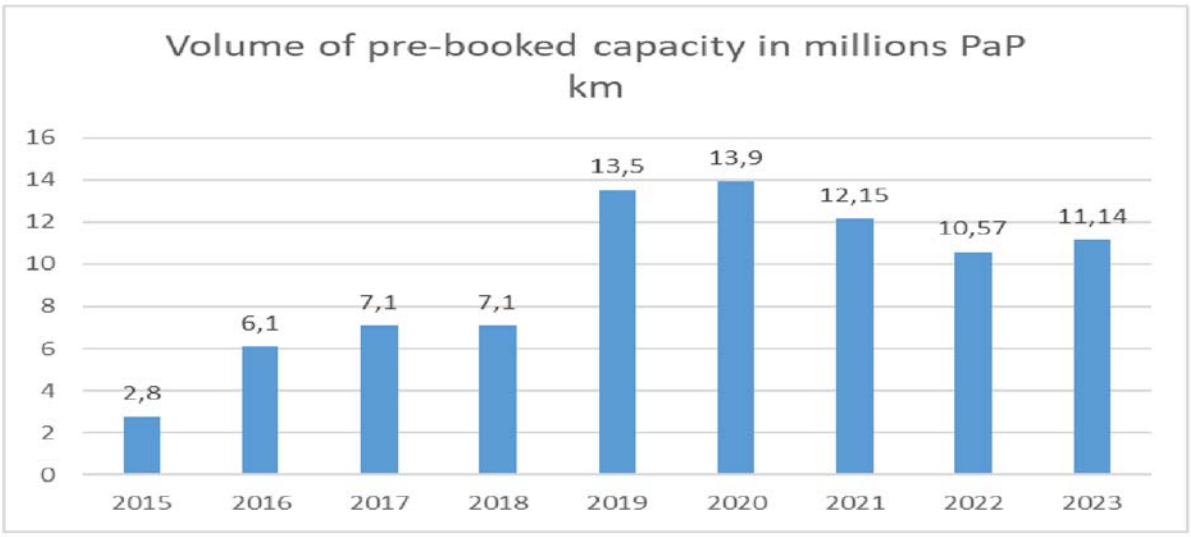
5.3.4 Volume of requested capacity (PaPs)

This KPI displays all the volume of requested PaPs (KMs per year) that have been received by the C-OSS of the Corridor for the annual timetables 2015 to 2023. Feeder and outflow sections as well as overlapping sections (with other RFCs) are not included.
Measured at the deadline for submitting path requests = X-8.



5.3.5 Volume of pre-booked capacity (PaPs)

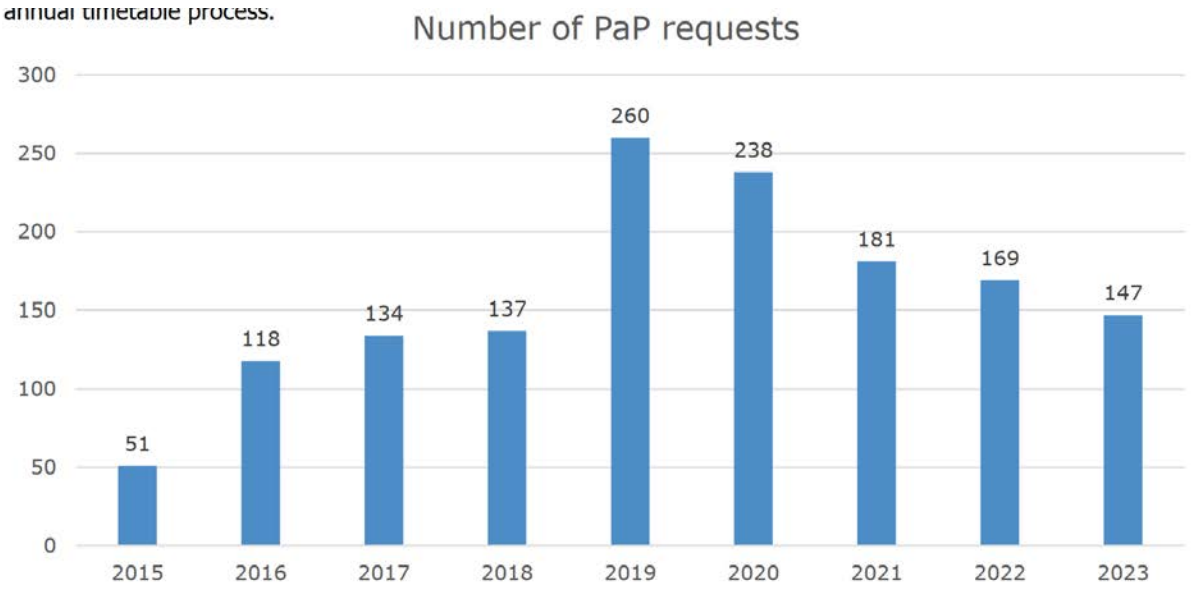
This KPI displays the volume of pre-booked capacity (PaPs in KM per year by the C-OSS of the Corridor for the annual timetables 2015 to 2023 during the pre-booking phase at X-7,5.



5.3.6 Number of requests (PaPs)

This KPI displays the number of PaPs requests that have been received by the C-OSS of the Corridor for the annual timetables 2015 to 2023 = number of PCS dossiers submitted at the deadline for submitting path requests in the annual timetable process.

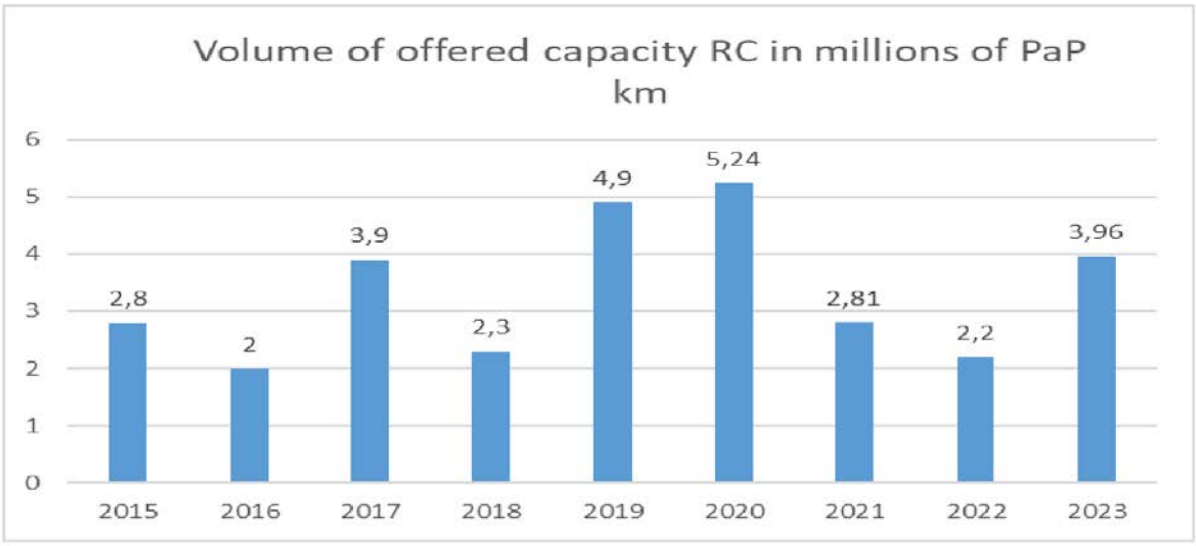
annual timetable process.



5.3.7 Volume of offered Reserve Capacity (RC)

This graph displays the volume of Reserve Capacity (RC) that has been published by the RFC C-OSS in October 2014 to 2022 for the timetables 2015 to 2023.

A total of **3,96 million KMs** were published as Reserve Capacity & Rolling Planning for TT2023 (**+80%** compared to TT2022)



Objective is of at least 10% of the capacity provided in the yearly timetable PaP Catalogue (in kms) is offered in RC.

5.4 Performance Monitoring

RFC North Sea - Mediterranean monitor its performance through the following common and internal KPIs:

- Capacity Management: measuring the performance of the corridor in constructing, allocating and selling the capacity:
  - Volume of offered capacity (PaPs)
  - Volume of requested capacity (PaPs)
  - Volume of pre-booked capacity (PaPs)
  - Number of requests (PaPs)
  - Volume of offered capacity (RC)
  - Volume of requested capacity (RC)
  - Number of requests (RC)
  - Number of conflicts (PaPs)
  - Ratio of pre-booked capacity (PaPs)
  - Average planned speed of PaPs

- Operations: measuring the performance of the traffic running along RFC North Sea-Mediterranean monitored in terms of punctuality andvolume of traffic:
  - Punctuality at Origin and Destination (≤ 30 min and ≤ 15 min)
  - RFC Punctuality
  - Number of trains crossing a border along the RFC

- Market Development: measuring the capability of the corridor in meeting the market demands:
  - Number of trains per border
  - Ratio of capacity allocated by the C-OSS and the total allocated capacity

In the near future, some new KPI's will be published, depending on the data quality:
Train kilometres of trains crossing a border along the RFC (Operations KPI)
Dwell times in border sections: planned and actual (Operations KPI)
Train kilometres of trains per border (Market development KPI).

As requested by the Regulation (EU) 913/2010, RFC North Sea – Med publishes each year its Performance Report.
It contains information on KPIs related to capacity management, operations and market development that are monitored by all RFCs according to the RNE guidelines on KPIs.

Annual reports can be found in the publications section of the RFC North Sea-Med webpage:
https://www.rfc-northsea-med.eu/en/page/publications

5.5 User Satisfaction Survey

Every year, as required by the Regulation (EU) 913/2010, a common satisfaction survey is organised by the RFC's, and the results are published on the website and in the annual report. The results are a base for discussion and exchange with stakeholders, e.g. in the Advisory Groups.

To make the results of the satisfaction survey more useful, RFC North Sea-Mediterranean works with all RFC's and the support of the RFC Network Assistant to improve the survey. The 2023 survey was sent out at the end of the summer. Since 2022 the possibility is given to have the survey in the form of an interview.
The questionnaire addresses topics such as coordination of works, the CID, capacity allocation, C-OSS, traffic management, train performance management, communication tools and advisory groups.

All results of the User Satisfaction Survey can be found on our dedicated figures page of our website: https://www.rfc-northsea-med.eu/en/page/figures-performance-corridor

6. Indicative Investment plan

RFC North Sea-Mediterranean collected data about investments from its Infrastructure Managers members. The investments planned by IMs are either renewal or development of the infrastructure. Some IMs combine both investment types if possible.
This investment plan considers four categories:

- The deployment of ERTMS to encourage interoperability and to avoid as quickly as possible the multiplication of on-board control command systems for operators.
- The improvement of the loading gauge to support the growth of the market share of combined transport with the carriage of P400 semi-trailers.
- The bottlenecks relief to facilitate the traffic in railway nodes experiencing capacity problems.
- The increase of the train length up to 740m (with loco) to standardise this technical characteristic on all the sections of the Corridor.

6.1 Capacity Management Plan

6.1.1 Projects

6.1.1.1 Lyon Railway Node (NFL)

This junction is:

- on the Northern Europe - Mediterranean axis and on two European freight corridors RFC Mediterranean and RFC North Sea – Mediterranean);
- at the heart of national and international high-speed links;
- on a territory with more than 8 million inhabitants in Auvergne-Rhône-Alpes with a strong demographic growth.

Located at the convergence of 15 European, national and regional railway lines, the Lyon railway junction is extremely busy, and its infrastructures are at the limit of capacity.
The objective of this project is to enhance the capacity of the current infrastructure for passenger and freight services and to establish a sustainable and gradual 20-year investment plan in collaboration with mobility stakeholders.
The project's total funding amounts to €310 million and involves several contributors: the European Union providing €40 million (13%), the state contributing €110 million (36%), the Auvergne-Rhône-Alpes region providing €110 million (36%), SNCF Réseau contributing €40 million (13%), and the Lyon Metropolis and CNR (Compagnie Nationale du Rhône) contributing €10 million (2%).

Launched in 2015, the project, which consists of 32 phases, will result in the strengthening of the railway network in the Lyon region by 2025.

6.1.1.2 Bottlenecks in Belgium

Most of the bottlenecks for Belgium, shown on the map under 2.3, are to be considered as potential bottlenecks as they are expected to appear in case the announced full modal shift for freight and passenger by 2030 is realised. The demand in 2030 was compared to the

available infrastructure in 2030, taking only into account the completion of the already started projects.

Additional studies will be carried out to do away with the bottlenecks (such as the study into possible developments in rail network operations led by the government,…). Although the multi-annual investment plan 2023 – 2032 foresees an envelope of maximum 145 million € for investments to remedy bottlenecks, not all potential bottlenecks are covered by remedial projects at this time.

6.1.1.3 Modernization of the Mulhouse railway junction

The Mulhouse train station serves as a major hub for the Grand Est railway network, connecting regional, national and international destinations. To enhance train traffic flows, increase the station's capacity, and improve customer service, SNCF Réseau is undertaking modernization projects from 2019 to 2026. These projects, with a total cost of 101.33 million €, are funded by the European Union, the French government, the Grand Est Region, and SNCF Réseau, making it one of the most significant railway construction endeavours in Alsace.

6.1.1.4 Other improvement projects

Other projects are planned to ease operations on RFC North Sea-Mediterranean.

The freight traffic between Basel and the French border is limited to two trains per hour per direction, due to flat junctions and the signalling system. To increase the capacity, the signalisation should be upgraded.

6.1.2 Train length increase

In the ***Netherlands*** 740m trains can only run with a lot of restrictions in timetable and operations.

In ***Belgium***, 740m trains can run, but for trains longer than 650m prior agreement is needed as stipulated in Infrabel's Network Statement "*The length of freight trains is limited in principle to 750m inclusive of traction units. The IM's agreement must always be sought for any train longer than 650m*".

In order to comply with the TEN-T requirement of enabling 740m trains to run on the TEN-T core network lines (Art. 39, Regulation 1315/2013) without timetable/operational restrictions by 2030, several projects were already launched, mainly in the frame of larger projects and some of them with CEF support. In addition, Infrabel started in December 2020 a specific study to identify locations where investments in side tracks are essential to allow 740m trains without restrictions. Apart from the existing and already planned side tracks, 12 additional locations were identified and prioritised. These are the minimum side tracks to be provided on the Belgian rail network. Several of these identified locations are also located on RFC North Sea-Mediterranean.

The aim is that, if all these projects are realised, a quality train path 24/7 can be offered for 740m trains on the freight lines of the core TEN-T network and some RFC lines. This goal is also supported in the Rail Vision 2040 and the subsequent action plan for rail freight of the Minister for Mobility, Georges Gilkinet.

The identified projects were also taken into consideration in the Performance Contract between the Belgian Government and Infrabel, signed in December 2022, and in the Multi-Annual Investment Plan 2023 – 2032.

In ***France and Luxembourg***, some 850 m trains are allowed to run and effectively run on the Bettembourg-Lyon route.

6.1.3 Loading gauge increase

The Corridor Transport Market Study performed in 2012 and 2013 showed a major market demand for the transport of trailers/trucks. This has been unanimously and repeatedly reaffirmed by railway undertakings in the advisory group meetings since 2013.

As P400 loading gauge already exists in Belgium and the Netherlands, and as a study was performed in Switzerland, similar studies were performed in 2015 to assess the opportunity to enhance the loading gauge on the French and Luxembourg part of the Corridor.

These studies enabled to assess the best solution and the related cost for the necessary infrastructure upgrade to have P400 loading gauge on the Rotterdam – Antwerp – Metz - Basel route of the Corridor. If the project goes live, it will facilitate the traffic of trains carrying trailers/trucks across borders (France, Belgium, Netherlands, Luxembourg, Germany, and Switzerland). It will also enable the connection with other lines with similar gauge, such as Perpignan – Luxembourg.

In Switzerland, on the Calais-Basel route, two tunnels (Kannenfeld, Schützenmatt) still need to be enhanced to achieve P400 loading gauge. In 2020, the Parliament mandated the Federal Council to conclude an agreement with France and Switzerland to build the access route to the ‘New Railway Link through the Alps’ also on the left bank of the Rhine (Metz-Basel). With the aim of creating a continuous North Sea Mediterranean corridor (Calais-Basel-Italy) with the free space profile required for semi-trailers with a corner height of 4 meters, it will be necessary to extend the free space profile on the Basel-St-Jean section on the Swiss side. The upgrading of both tunnels is currently in the preliminary project phase.

In France, the study showed that on the Calais – Basel route, 11 tunnels (tunnels of Liart, Martinsart, Montmédy, Vachemont, Platinerie, Fontoy, Mercy, Arzviller, Lutzelbourg, Niederrheinthal and Haut Barr) needed to be enhanced to meet the AFM 427 gauge (close to P400 with usage of 27cm high wagons), and most of them needed to obtain external financing.

In 2020, a socio-economic study was conducted by SNCF Réseau on the main routes of its network and is still ongoing (more information on the website of SNCF Réseau: https://www.sncf-reseau.com/fr/subventions-europeennes-2021-2025).
European funding totalling €4.5 million has been granted for preliminary design studies and additional preliminary research, out of a total budget of approximatively €10 million. The objective of these studies is to bring the Vosges tunnels, located between Saverne and Sarrebourg, up to the LGP 400 loading gauge standard and to increase capacity on this line section in order to absorb the future rail freight demand.

These seven tunnels in France, with one already meeting the LGP 400 specifications, enable the crossing of the Vosges Mountains for both the Strasbourg - Nancy - Paris and Strasbourg - Metz - Luxembourg rail routes. The latter route is part of the RFC North Sea-Med. The project aims to improve loading standards and eliminate bottlenecks by establishing the necessary connections in railway hubs, ultimately boosting European freight traffic

6.2 List of projects

RFC North Sea-Mediterranean identified a list of projects or programs which may go live in a 10 year time horizon.

WARNING: this list displayed in the table in annex is provided on an indicative basis. The list of projects provided in this document is presumably considered as secured, unless indicated otherwise. This matter falls within the remit of the Member States, in accordance with the principle of subsidiarity. A number of technical, political or financial factors may affect the completion of the listed projects. It is therefore possible that at least some of these projects will not be put into service or will be delayed. Similarly, the dates and costs presented in this list may be modified from time to time in the future.

All projects can be found in Annex I to this Implementation Plan, and some are displayed on the interactive map in CIP.

6.3 Deployment Plan relating to interoperable systems

RFC North Sea-Mediterranean already complies with most of the interoperability criteria. To comply with the control command and signalling specifications for interoperability, RFC North Sea-Mediterranean is currently deploying ETCS (European Train Control System) on its lines.

6.3.1 ERTMS strategy along the corridor

In Belgium, ETCS version 2.3.0.d Level 1 FS (punctual information given to the trains by in-track balises) is installed all along the principal routes of the former Corridor C, except for the section Kapellen – BE/NL border, where Infrabel opted to install ETCS Level 2 FS version 2.3.0d compatible (continuous information exchanged between track and on-board systems through GSM-R).

In the Netherlands, ProRail is installing ERTMS Level 2 baseline 3 on the section Kijfhoek – NL/BE border (live 2028-2030).

In Switzerland, Baseline 3 balises are implemented for the Limited Supervision mode. 2.3.0d on-board systems cannot run on Baseline 3 tracks in ETCS Level 1 to reach Basel SBB Rangierbahnhof (Marshalling Yard), the Northern destination of the Corridor, and access to the Swiss part of RFC Rhine-Alpine. Locomotives will have to be equipped with baseline 3 on-board equipment to be able to run under ETCS limited supervision in Switzerland according to Notified National Technical Requirements (NNTR). At middle term the actual allowed

access of locomotives with 2.3.0d equipped with KVB/PZB (STM) will be dismantled. **Therefore it is highly recommended for railway undertakings to equip their rolling stock with Baseline 3 on-board systems**.

In France, the sections between Athus – Bettembourg and Basel are already equipped in ETCS level 1 version 2.3.0d.
The deployment dates for the other French sections of the corridor are currently being studied and should be presented to the commission via the National Implementation Plan (NIP) in 2024.
The section Longuyon – Basel is planned to be put in service in several steps, foreseen from 2026 on.

In Luxembourg, the network is already fully equipped and interoperable since 2017 with ETCS level 1 version 2.3.0d

For 2.3.0d on-board systems, the recommendation is to implement the braking curves algorithm specified in baseline 3.

6.3.2 Compulsory systems and deactivation of national legacy systems

Once ETCS is installed, the deactivation of national legacy systems has to be decided on a country per country basis.

- **In the Netherlands**, the line Kijfhoek – Roosendaal will be equipped in 2028-2030.

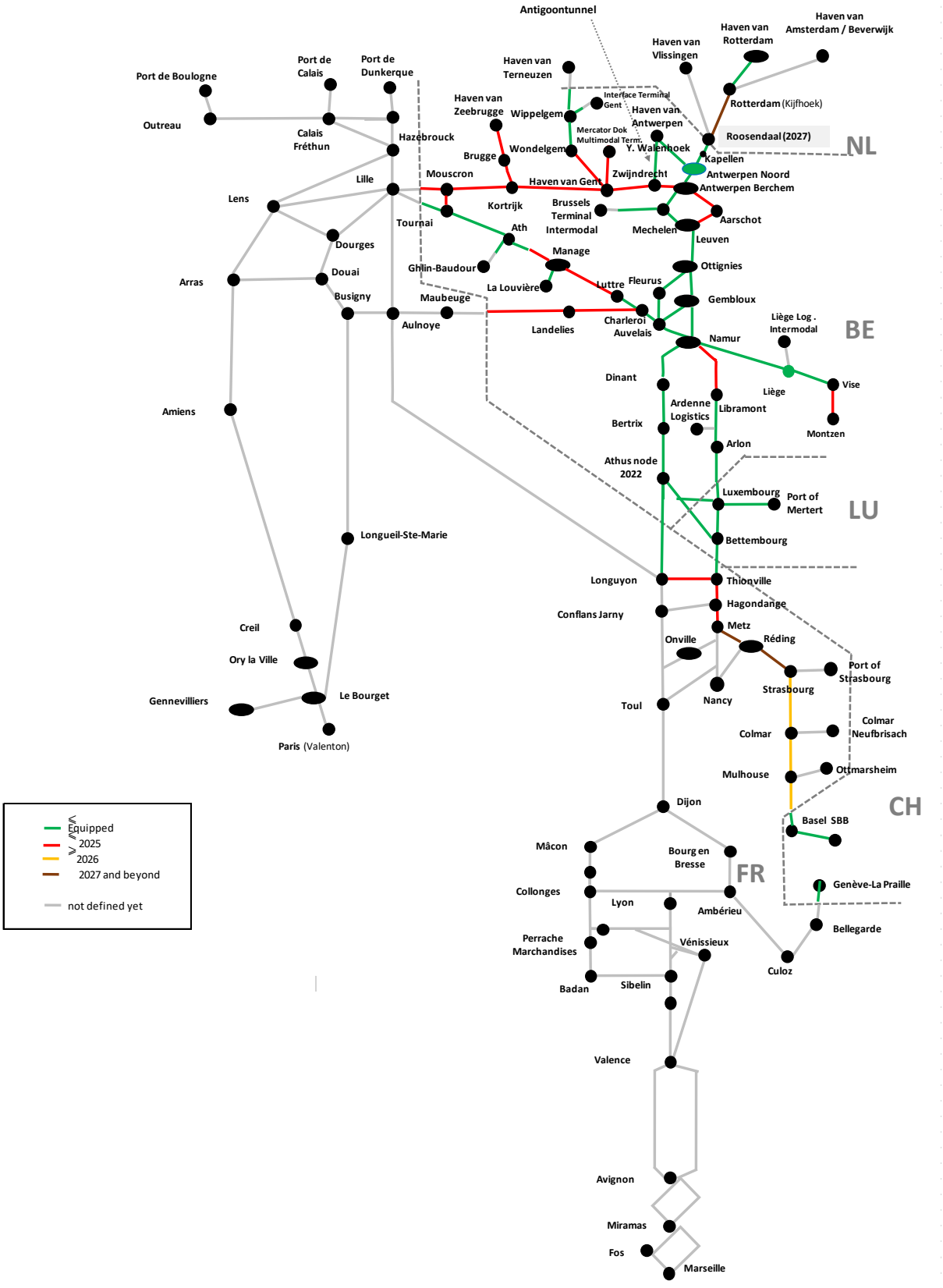
- **In Belgium**, the outlined ERTMS implementation of the Corridor lines is part of a country-wide migration program by 2025, with the aim to improve the safety level on the whole network. This program is called the ETCS Master Plan.
  All vehicles in Belgium have to be operable with ERTMS by 2025, whereby ETCS Level 1 and Level 2 Full supervision (Baseline 2 and Baseline 3) tracks shall be equipped with System Version 1.x to allow Baseline 2 and Baseline 3 locos. On the other hand, ETCS Level 1 Limited Supervision (Baseline 3) tracks shall be equipped with System Version 2.x in order to allow the operation in Limited Supervision by the Baseline 3 locos. Consequently, in order to permit Baseline 2 vehicles to still run on those lines, the TBL1+ system will be kept until all RUs running on those lines will have migrated to Baseline 3 as well (until end of 2025).
  Since December 2016, the class B system Memor/Crocodile is put out of service on the lines equipped with ETCS Level 1 FS version 2.3.0d, allowing only trains equipped with ETCS Level 1 or TBL1+ to run on these tracks.
  A Royal Decree published in 2018 with the latest revision on 6 December 2020 has extended the decommissioning of the Memor/Crocodile class B system on the main tracks equipped with any level of ETCS. Moreover, this Royal Decree foresees at 14/12/2025 the decommissioning of the TBL1+ system. All main tracks in Belgium will become ETCS only.
  Railway operators are strongly encouraged to equip their rolling stock with baseline 3 to accommodate as much as possible future upgrades of the infrastructure.

- **In Luxembourg**, the whole network is equipped with ETCS Baseline 2 (version 2.3.0d), Level 1. Since 1st of July 2017 trains have to be equipped with ETCS with an temporary derogations for existing rolling stock operating on the network before that date. That derogation finally ended on 31/12/2020;

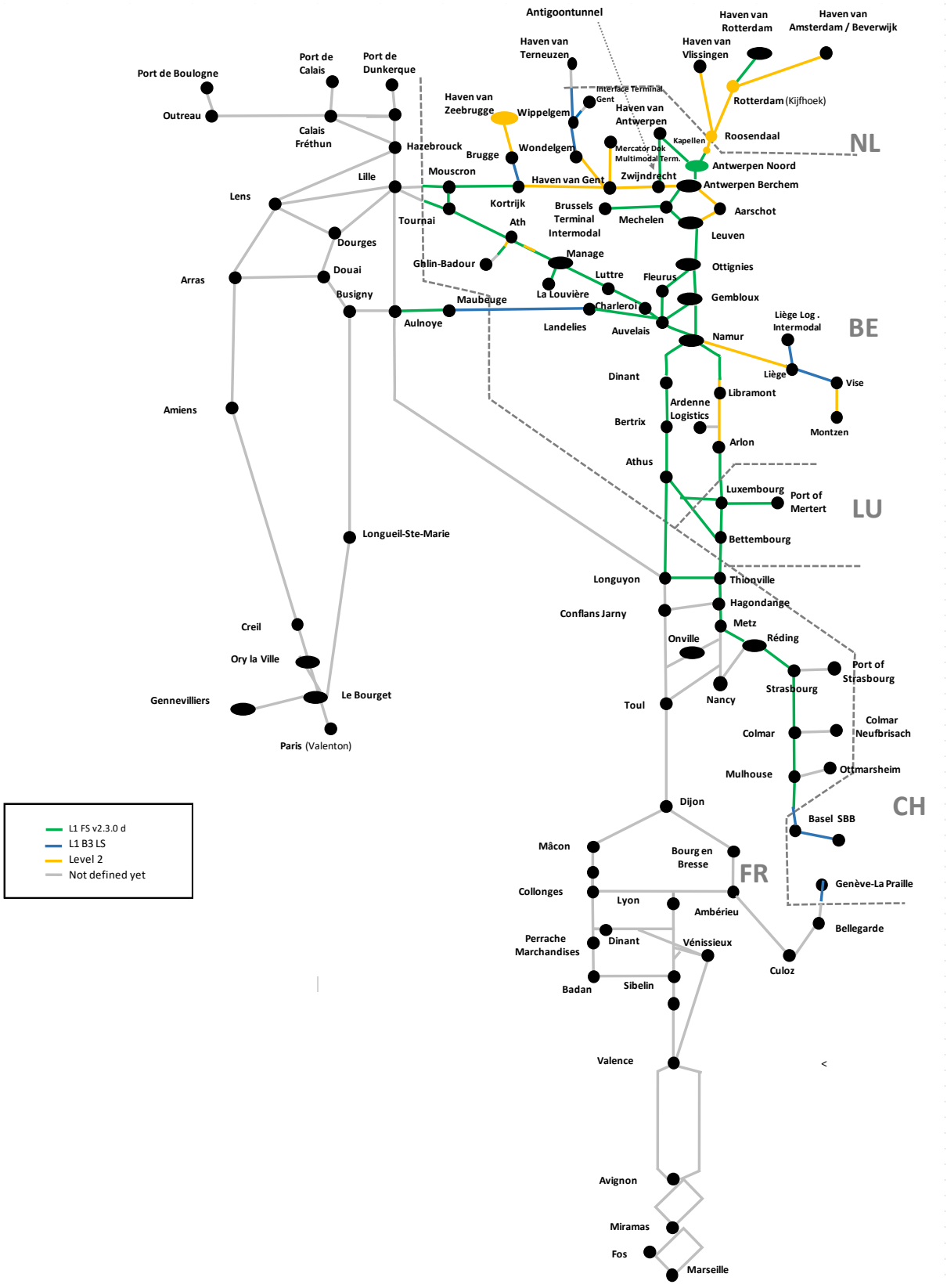
- **In France,** the national KVB legacy system used between Athus – Bettembourg and Basel will be decommissioned at some point in the future. The date of this decommissioning is not yet determined.
- For the remaining parts in France, the strategy is to install level 2 and decommissioned KVB at the same time.
- **In Switzerland**, all new vehicles purchased after July 1st 2014 have to be equipped with ETCS Baseline 3. The national system EuroSignum/ EuroZUB is implemented as part of ETCS packet 44 on the line sight signalling network. A trackside deactivation is not yet planned.

6.3.3 ERTMS deployment plan

The planning of the ETCS deployment along the corridor lines and the ETCS level can be seen in the maps below (see next page) :



Timeline ERTMS (Dec-2023)



ETCS Level (Dec-2023)

6.4 Reference to Union Contribution

The financial resources available to RFC North Sea - Mediterranean come from contributions from its members and partners and European subsidies. Since its establishment, RFC North Sea - Mediterranean has been supported by several grants from the European Commission.

At the moment, the RFC benefits from a grant under the CEF II Programme with project name ‘Technical Assistance for promoting an effective implementation of Regulation (EU) 913/2010 by Rail Freight Corridor North Sea - Mediterranean’ (Project number: 101082407 – Project Acronym: 21-LU-TG-NorthSeaMedRFC-TA) for the years 2021 - 2024.

The RFC North Sea – Mediterranean also takes part in a consortium with RNE, in the project named ‘Digital Capacity Management Implementation 2022-2024 grant’ (Project 101079600 – Project Acronym: 21-EU-TG-DCM IMP 22_24), where the RFC is performing a MVP (Minimum viable product) study on ‘Capacity intelligence & visualization’.

Annex I: Indicative Investment Plan

See Table file attached.