European Commission

ERTMS

Second Work Plan of the European Coordinator

Karel Vinck

JULY 2016

Transport

JULY 2016

This report represents the opinion of the European Coordinator and does not prejudice the official position of the European Commission.

Work Plan for ERTMS

Executive summary

With this Work Plan for ERTMS the European Coordinator would like to take stock of his Breakthrough Program published in 2015, since the consultations with Member States and infrastructure managers on the review of the existing European Deployment Plan (EDP 2009) have been finalized. A proposal for the Member States on a new implementation timeline is part of this Work Plan. A major step has been reached by the European Rail Agency in stabilizing the technical specifications: a complete and stable ERTMS version was voted by the Member States by unanimity in February 2016 and entered into force on 5 July 2016. Business cases for corridors have been drafted to evaluate the possible economic impact of ERTMS from a European perspective for the Core Network Corridors. After a last consultation with the Member States in the coming months, the reviewed European Deployment Plan will be proposed for adoption end of 2016.

1. Introduction

The fundamental objective of deploying ERTMS is implementing **INTEROPERABILITY** on the entire rail network of the European Union.

In order to reach our ultimate goal of interoperability, three conditions need to be fulfilled: remove the bottlenecks on the infrastructure, harmonize the national operational rules and approval procedures, and deploy the European Rail Traffic Management System (ERTMS). ERTMS is a control, command, signalling and communication system that has been available on the European market for more than 20 years. It is a software based system for the railway management and safe regulation that a. o. continuously ensures that the train does not exceed the safe speed and headway.

ERTMS is one of the main contributors to achieve interoperability in European railway network, allowing the train to run without stopping at the borders for technical and operational reasons. Today there are more than 20 train control systems across the EU that hamper the free circulation of trains and increase costs and complexity of operational and technical rules. Over the last ten years significant results have been achieved on the technological and organizational harmonisation as well as on the financial side; however, we are still far away from interoperability.

Karel Vinck, European ERTMS Coordinator, has been following up closely these developments and proposing solutions to all involved actors, in order to ensure a coordinated and European approach for ERTMS implementation that would directly contribute to the realization of a sustainable and interoperable Single European Railway Area.

2. Breakthrough program for ERTMS - Deployment policy

At the end of 2014, the European ERTMS Coordinator proposed a Breakthrough Program to speed up the implementation of ERTMS, in order to get closer to the ultimate aim of interoperability. It defines a limited number of objectives of the highest priority - based on certain principles – to be planned with clear commitments by the end of 2016.

The principles are the following:

- Users first and not Designers first
- Entire priority and focus on deployment
- A cost structure which supports the competitiveness of the railway system
- A standardized B3 on board equipment

The application of these principles will make it possible to reach the objectives of the Breakthrough Program over the agreed deployment period:

- realistic and committed European Deployment Plan for the Core Network Corridors
- complete, stable and mature set of specifications with the adequate maintenance procedures
- a standardized B3 on board unit capable of running on an interoperable and compliant infrastructure
- clear and transparent regulatory framework
- facilitation of the deployment

3. Realistic and committed European Deployment Plan for the Core Network Corridors

Currently there are two European legal acts that define the obligation to implement ERTMS on a part of the European railway network. The current deployment plan in force since 2009 (Commission Decision (EU) 2015/14 of 5 January 2015 amending Decision 2012/88/EU on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail systems and subsequent amendments) defines six ERTMS Corridors that were representing the highest freight traffic volume almost ten years ago with implementation deadlines of 2015 and 2020. In addition, the TEN-T Guidelines (Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU) stipulate the ERTMS deployment of the TEN-T network with a definite time horizon. There are two major milestones: by 2030 at the latest, the core network (the strategically most important part of the TEN-T) and by 2050 the comprehensive network needs to be equipped.

The European Coordinator announced already in the Annual Report of 2013 that deadlines laid down in the 2009 EDP cannot be kept by many Member States due to shortage of financing, limited number of available qualified experts (engineers, project managers, drivers with necessary knowledge on ETCS), technical problems during implementation, lack of trust in the ERTMS safety case and initial resistance by the national safety authorities to leave the lega-

cy systems. He proposed to review the EDP of 2009 and already the year after he launched this review. In December 2014 the European ERTMS Coordinator started a consultation with Member States by sending out the Work Plan for ERTMS that contained a proposal for the implementation timeline of the Core Network Corridors. This activity launched a close dialogue with Member States. The Coordinator had numerous bilateral discussions with high-level representatives of the Transport Ministries and Infrastructure Managers in 2015 and 2016 which followed an extensive exchange of e-mails/letters, phone conversations.

As proposed in the Work Plan for ERTMS 2014 (Breakthrough Program) the discussions about ERTMS implementation of Core Network Corridors was carried out following a two-step approach: as a first step those sections were defined already in 2015 that can be implemented by 2020. The remaining sections (to be completed between 2020 and 2030) were subject to discussion and planning in 2016. Furthermore, the geographical scope of the deployment plan has been aligned with the requirements of the TEN-T Regulation and the originally six ERTMS Corridors have been extended to the nine Core Network Corridors. In number of cases it was impossible to receive concrete dates for this second period, due to financial uncertainties, however the legal framework has to be respected.

As outcome of regular bilateral discussions with Member States, initiated and led by the European Coordinator, realistic completion dates have been defined. In order to guarantee smooth cross-border operation on the already implemented lines or networks, the highest priority has been given to the cross-border sections of these Member States to be implemented in the first step (by 2020).

The new deployment plan will ensure a well-structured ERTMS implementation, coordinated between the Member States. It will make sure that the ERTMS planning on the Core Network Corridors is realistic and endorsed by the Member States. In addition it will provide a solid basis for the investment planning of the Railway Undertakings, Infrastructure Managers, and for the supplying industry. The new EDP will facilitate the efficient use and distribution of available human resources for ongoing track side and on-board projects. There is one basic assumption: the supplier industry must guarantee the timely delivery of ERTMS products with the support of this deployment plan. At the same time, this shall boost the competitiveness of the industry and reduce the costs of equipment, to make ERTMS a significant factor in opening the market for European rail companies.

As a parallel exercise to the consultation of Member States, the European Coordinator involved the representatives of the railway sector and the European Union Agency for Railway in this discussion at several occasions (meetings, conferences, bilateral discussions etc.): The representatives of the railway sector (association of the railway industry (UNIFE), of the infrastructure managers and railway undertakings (EIM, PRIME (platform of infrastructure managers in Europe) CER, UIC)) were actively participating in the discussions and are supporting the review of the current deployment plan. On the basis of the information available the European ERTMS Coordinators proposes to the European Commission and the Member States to implement the reviewed European Deployment Plan (in annex to this Work Plan).

4. A complete, stable and mature set of specifications

The stability of the specifications is a key factor for the success of ERTMS; stability protects ERTMS investments, avoids costs and delays due to system upgrades. A complete and stable ERTMS version (release 2 of Baseline 3) was voted by the Member States by unanimity on the 10 February 2016 (positive opinion of the Railway Interoperability and Safety Committee) and entered into force on 5 July 2016. The publication of the Commission Regulation on the Technical Specification for Interoperability relating to the control-command and signaling subsystems (CCS TSI) is a major milestone for achieving this objective. This Regulation not only includes the new ERTMS specification, but also introduces transparency and clarity in the procedures to be followed to guarantee that the equipment is fully interoperable.

This ETCS Baseline 3 Release 2 specification is fully backwards compatible with the current versions in the TSI in force and will allow a standard interoperable on-board unit to be produced. In order to protect existing investments, the European Railway Agency and the sector have conducted an analysis that demonstrates this compatibility between the Baseline 3 specification and the existing Baseline 2 infrastructures. The results of this analysis are being implemented to allow Baseline 3 trains to run everywhere. Over the last years the European Coordinator has emphasized the importance of having locomotives equipped only with Baseline 3, so that compatibility with Baseline 2 and 3 infrastructure can be guaranteed.

Baseline 3 Release 2 specification introduces functionalities agreed by the sector, the Commission and the European Union Agency for Railways in 2012 in a "Memorandum of Understanding". These include GPRS, in order to use radio spectrum more efficiently in areas with high frequency of trains, improved management of cryptographic algorithms with better resilience to cyber-attacks. The GSM-R specifications include now the standards for improved receivers more resistant to interferences.

ERTMS is the backbone for the digital railways and supports progressive introduction of more automation. The Sector, with the European Union Agency for Railways, have identified the major game changers that in association with ERTMS can improve the competitive position of the railways and deliver more quality and capacity with investments in software and control systems rather than in construction and "hard" infrastructure. A longer term perspective report was endorsed by the Member States at the RISC: it defines the roadmap to reap the benefits of improved technologies like satellite navigation, automated operations in a compatible manner. The Commission and the European Union Agency for Railways have established a Platform of ERTMS Stakeholders to ensure the strategic steering and follow up of the disciplined and compliant deployment of ERTMS in Europe.

In addition, the Commission and the European Union Agency for Railways are fully committed to the implementation of the technical pillar of the Fourth Railway Package. On this issue, the European Parliament was a key partner advocating for an enhanced role of the European Railway Agency as the ERTMS System Authority.

5. Business case for ERTMS

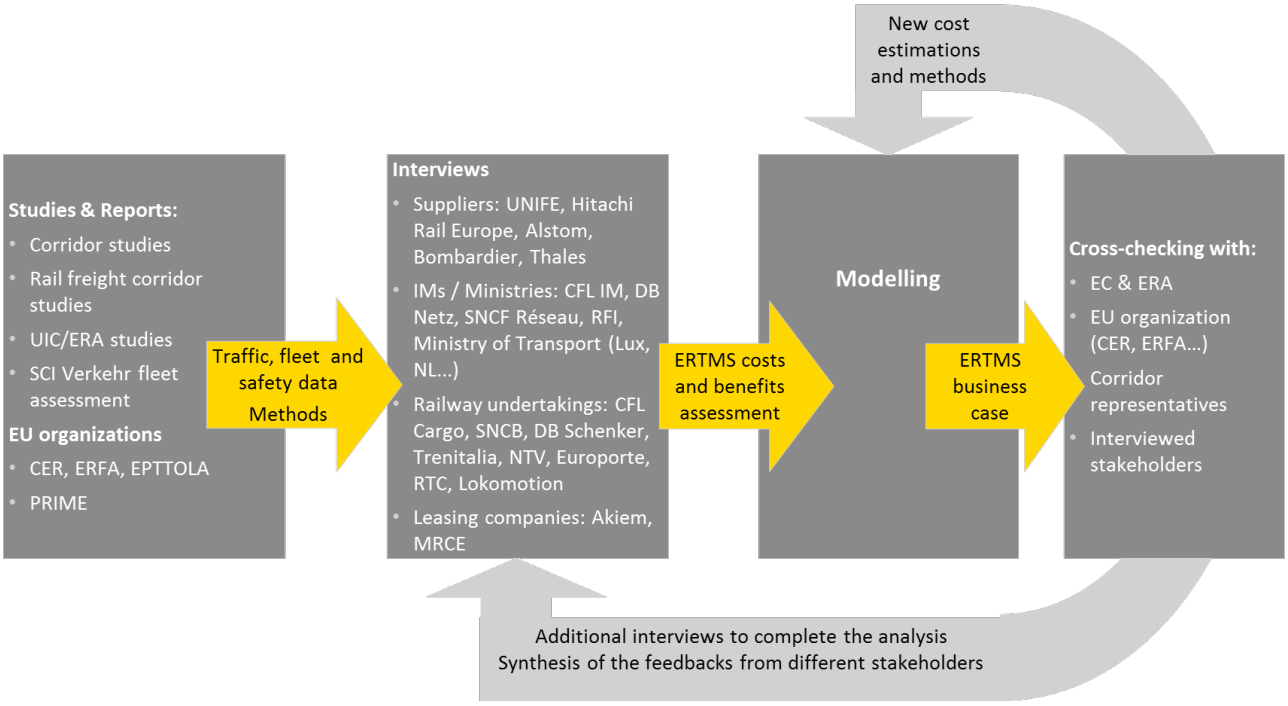
To date, there has not been a comprehensive analysis of the business case for ERTMS deployment along the nine Core Network Corridors. Nonetheless, the financial aspect is a key pillar for a successful ERTMS deployment in Europe.

To evaluate the benefit that ERTMS can bring not only from the technical side but also from the economic perspective, as part of the consulting work of the ERTMS Deployment Management Team, a full business case analysis of coordinated ERTMS deployment has been carried out across the nine Core Network Corridors, considering the business case of ERTMS from a European perspective, rather than from a national one.

Specific care has been given to the robustness of the assumptions used in the calculation. The objective of robustness has been reached through:

- **multiple discussions with stakeholders during the whole process**
- **the realistic and committed deployment plan taken into account in the calculation**
- **the use of conservative assumptions on some critical parameters, for instance the size of the fleet to be retrofitted**
- **the use of a range of values for long term assumptions which are based on the key principals defined in the Breakthrough program**

The overall process of development of the business case is summarized in the figure below:



Three scenarios have been developed to evaluate the economic benefits of ERTMS implementation:

- Scenario 1 - conservative scenario: This scenario is the new base case, it uses data that are coming from analysis and interviews with stakeholders. The results are a conservative interpretation, provided that the current difficulties such as actual problems in interoperability of ERTMS and stability of the specifications are solved.
- Scenario 2 - Ambitious and defendable scenario: This scenario uses assumptions that can be achievable provided that all stakeholders take advantage of the new system to optimise their operations.
- Scenario 3 "all L2" scenario, including the assumptions from scenario 2: This scenario explores the impact of a full track-side Level 2 deployment on the "ambitious scenario". This may be seen as an ideal scenario which can be used as a reference.

The present business case focuses only on the freight traffic and as a next step it will be extended with the passenger part as well. Having said that, the development of the business case is not a static process, and in the coming work programme period, the business case will be further refined through continued engagement with stakeholders, incorporation of new data and adaptation of the assumptions, if needed.

Based on the current information, the overall business case analysis shows a positive business case for ERTMS deployment across the 9 Core Network Corridors. It also underlines that if ERTMS is implemented in a coordinated manner, it will bring benefit for the entire railway community.

The first positive results will be disseminated amongst Member States and the wider stakeholder community and used to bolster the case to accelerate and coordinate ERTMS deployment.

6. Facilitation of the deployment

The railway sector has been heavily relying on EU subsidy, since ERTMS has become one of the most important horizontal objectives of TEN-T Policy. In the previous programming period close to € 400 million have been granted for ERTMS track side and on-board equipment. Since 2014 Connecting Europe Facility and Regional Funds have been providing significant amounts for ERTMS deployment (first CEF call: € 255 million, second CEF call: € 400 million). Yet, EU funding is limited and the Commission has experienced high oversubscription in all ERTMS Calls over the last ten years. The need to look for alternative financing is getting more and more urgent.

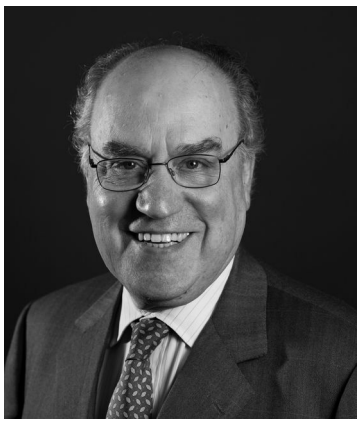
The European Coordinator has requested several times the necessity of having an ambitious and defendable business case for ERTMS that can provide a solid evidence base for Member States, infrastructure managers and railway undertakings in decision-making about ERTMS investments, including the potential use of private finance and EU-backed financial instruments (such as from the European Fund for Strategic Investments), which are an additional source of support for deployment.

The Coordinator and the Commission continue to support stakeholders, through engagement and analysis into potential schemes to take advantage of new sources of support. For example, PwC carried out a report on the deployment of innovative financial schemes to support ERTMS deployment, which identified a number of proposals and models to support ERTMS deployment using EU financial instruments (for example through PPPs, or the creation of investment platforms to support deployment). The Coordinator, Commission, and the EIB will continue to work with stakeholders in a constructive manner to support the application of such schemes where they are taken forward.

7. Conclusions

The European Coordinator has referred on many occasions to the fact that the point of no return has been reached: ERTMS has been fully accepted from technical and from political point of view. Breakthrough Program for ERTMS of 2015 defines the way and the tools how to deploy ERTMS successfully in the European Union.

The effective implementation of the Breakthrough Program is based on the condition that all involved stakeholders take a firm commitment and fulfill the obligations linked to their specific role: Member States, infrastructure managers, railway undertakings, suppliers and the European Commission. The draft of the reviewed deployment plan provides a realistic and committed, short and medium term planning instrument for all stakeholders. The business cases for the Core Network Corridors include ambitious and defendable assumptions and targets, but they are more than just an exercise to evaluate the possible positive economic impact of ERTMS at corridor level. They should make us aware of the fact that there is an urgent need for a change in the mindset of the railway sector, both in terms of investments and operations. The required changes should be decided and implemented with a conscious sense of urgency, because rail will never be a competitive and sustainable transport mode without an efficient interoperability in the European Union.

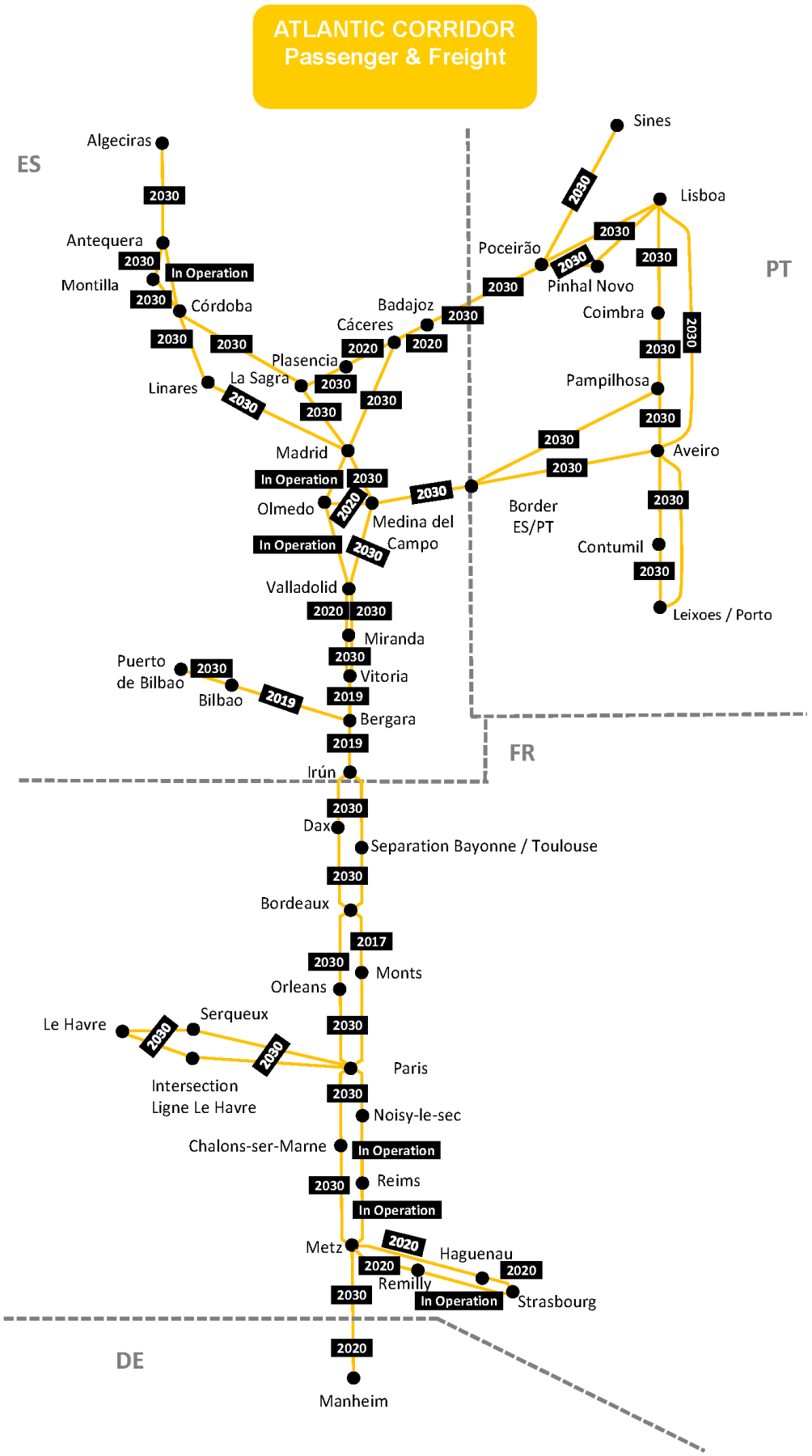


Contacts:

Karel Vinck, European Coordinator

Judit Bertrand, Advisor, **email:** judit.bertrand@ec.europa.eu

ERTMS:ec.europa.eu/transport/modes/rail/ertms/index_en.htm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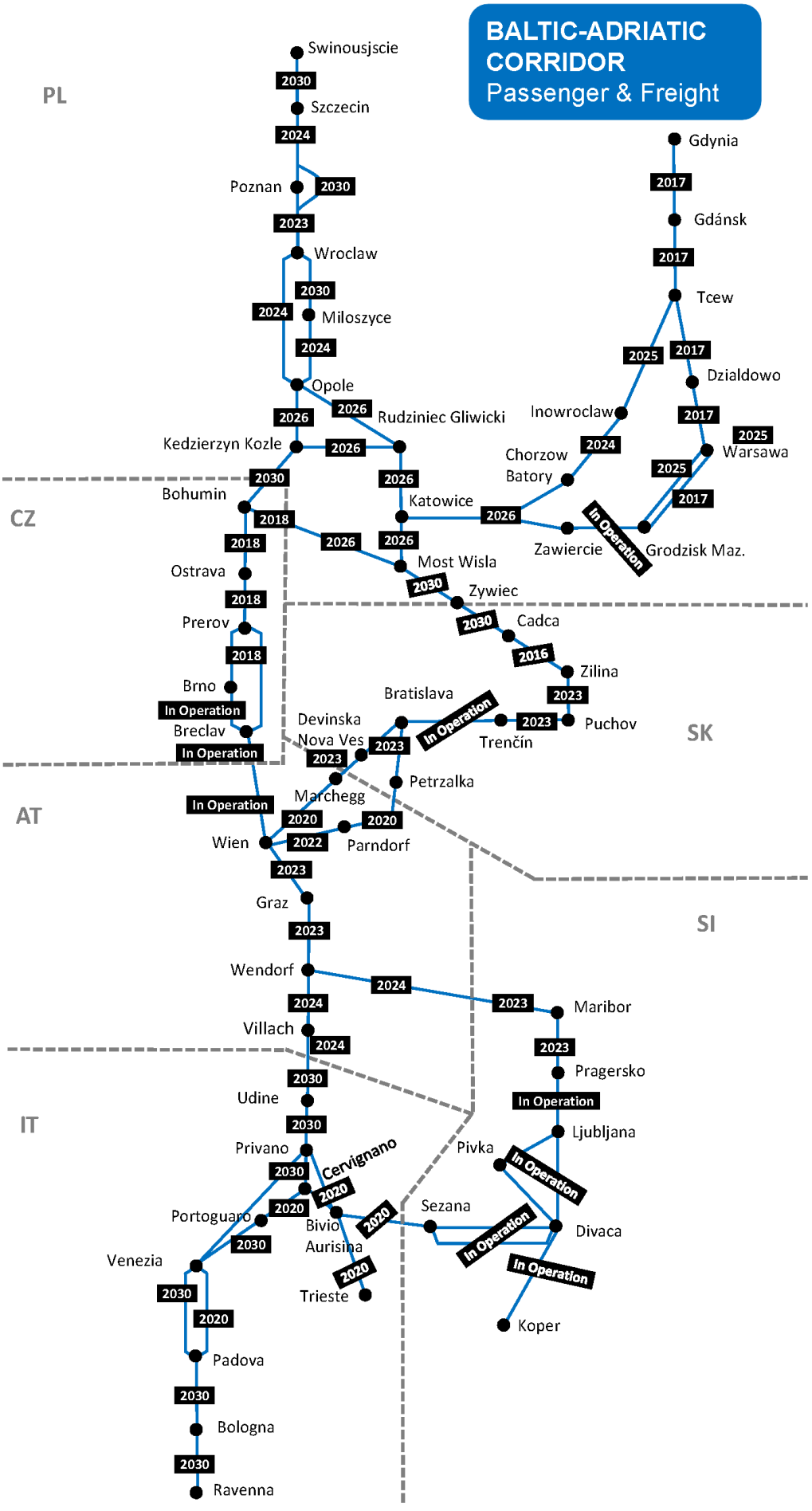
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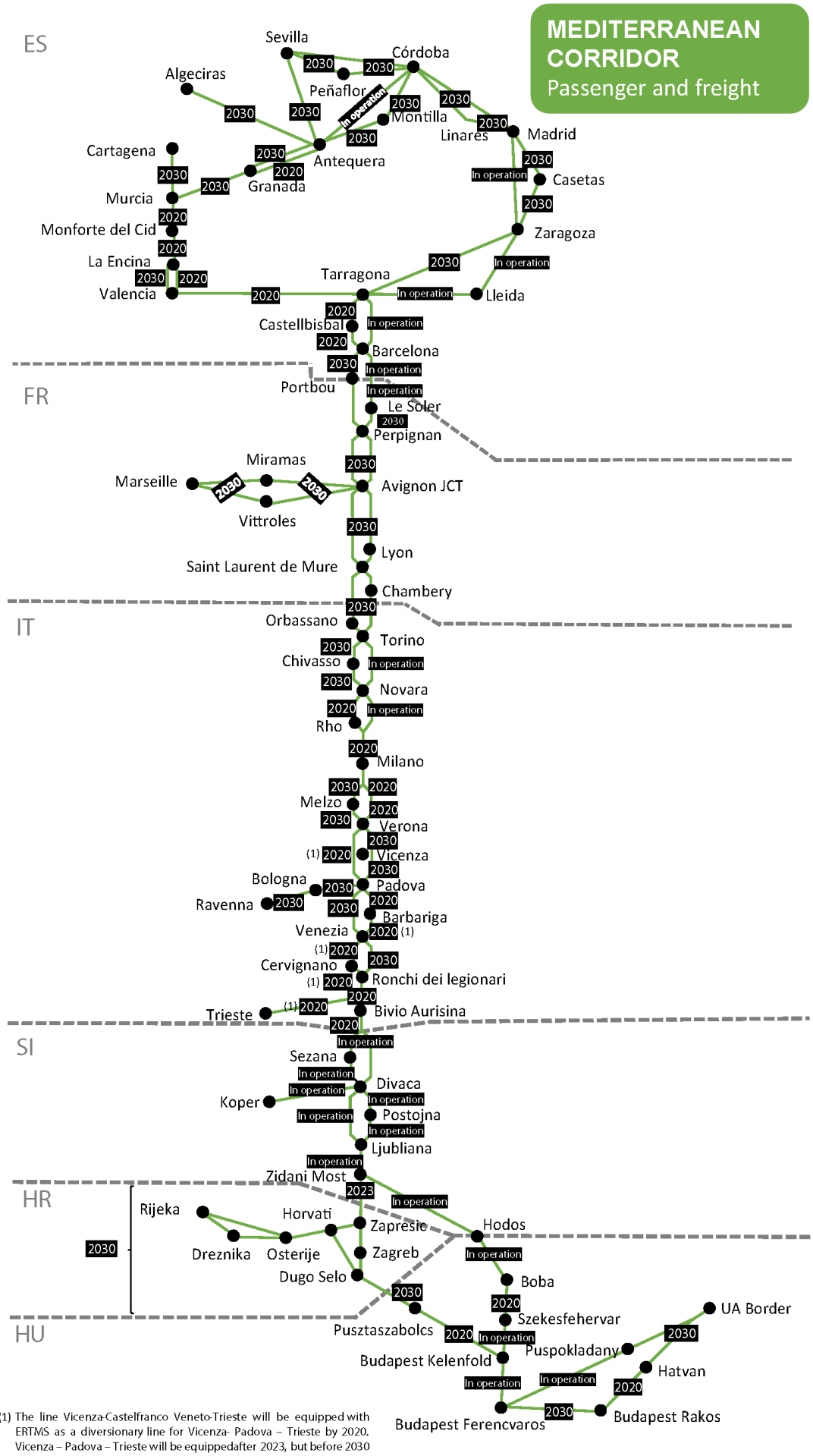
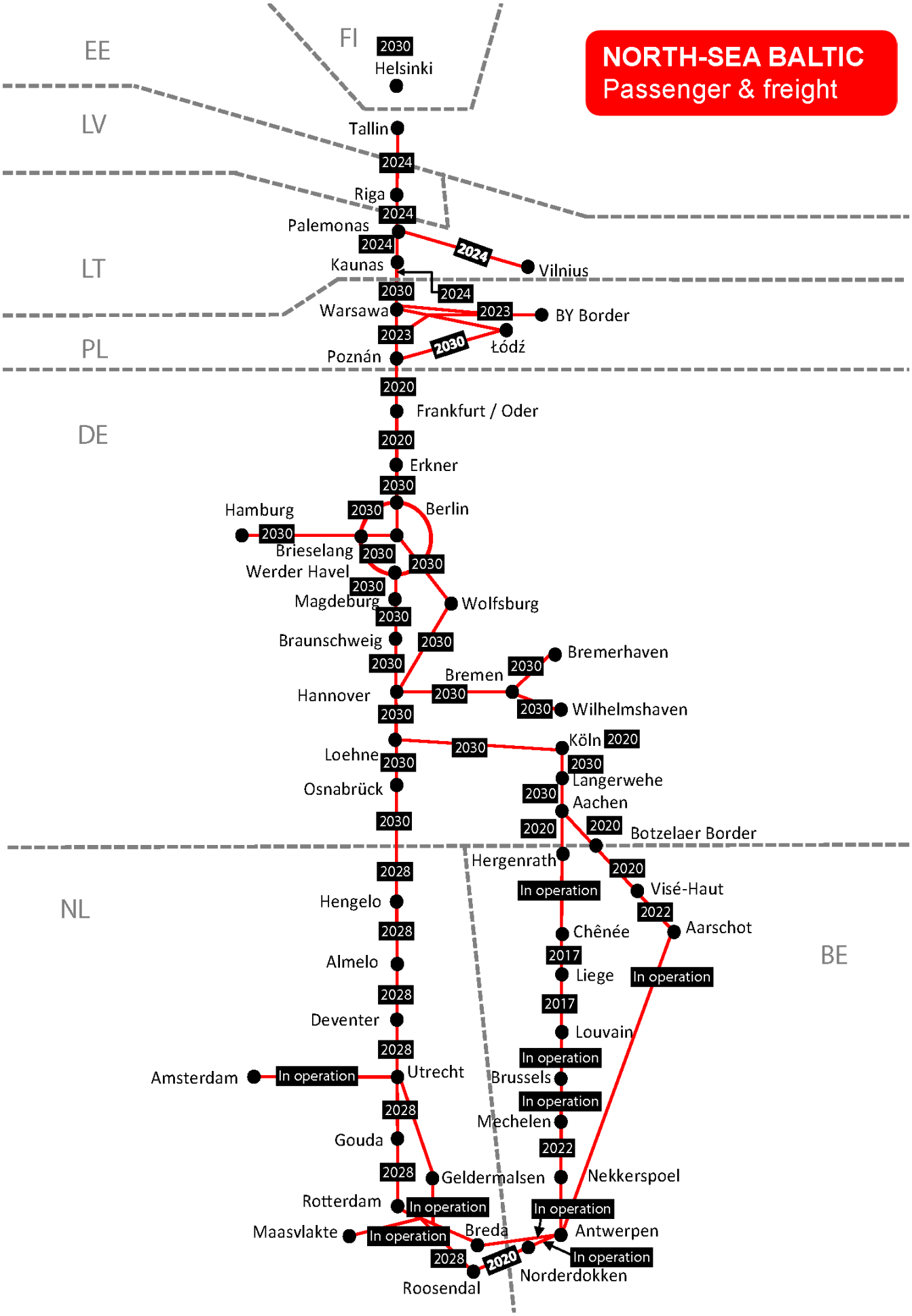


(1) The line Vicenza-Castelfranco Veneto-Trieste will be equipped with ERTMS as a diversionary line for Vicenza- Padova – Trieste by 2020. Vicenza – Padova – Trieste will be equippedafter 2023, but before 2030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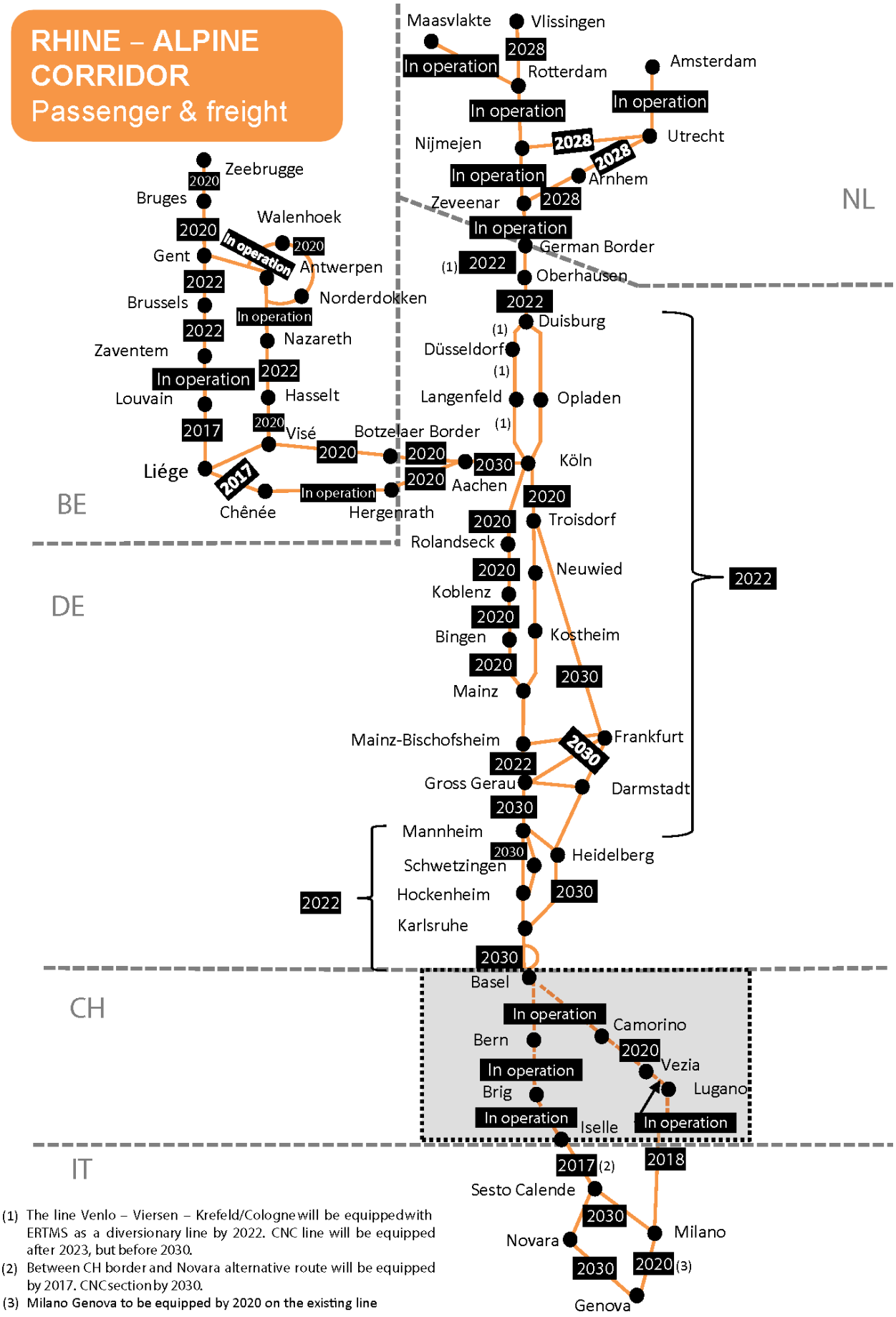
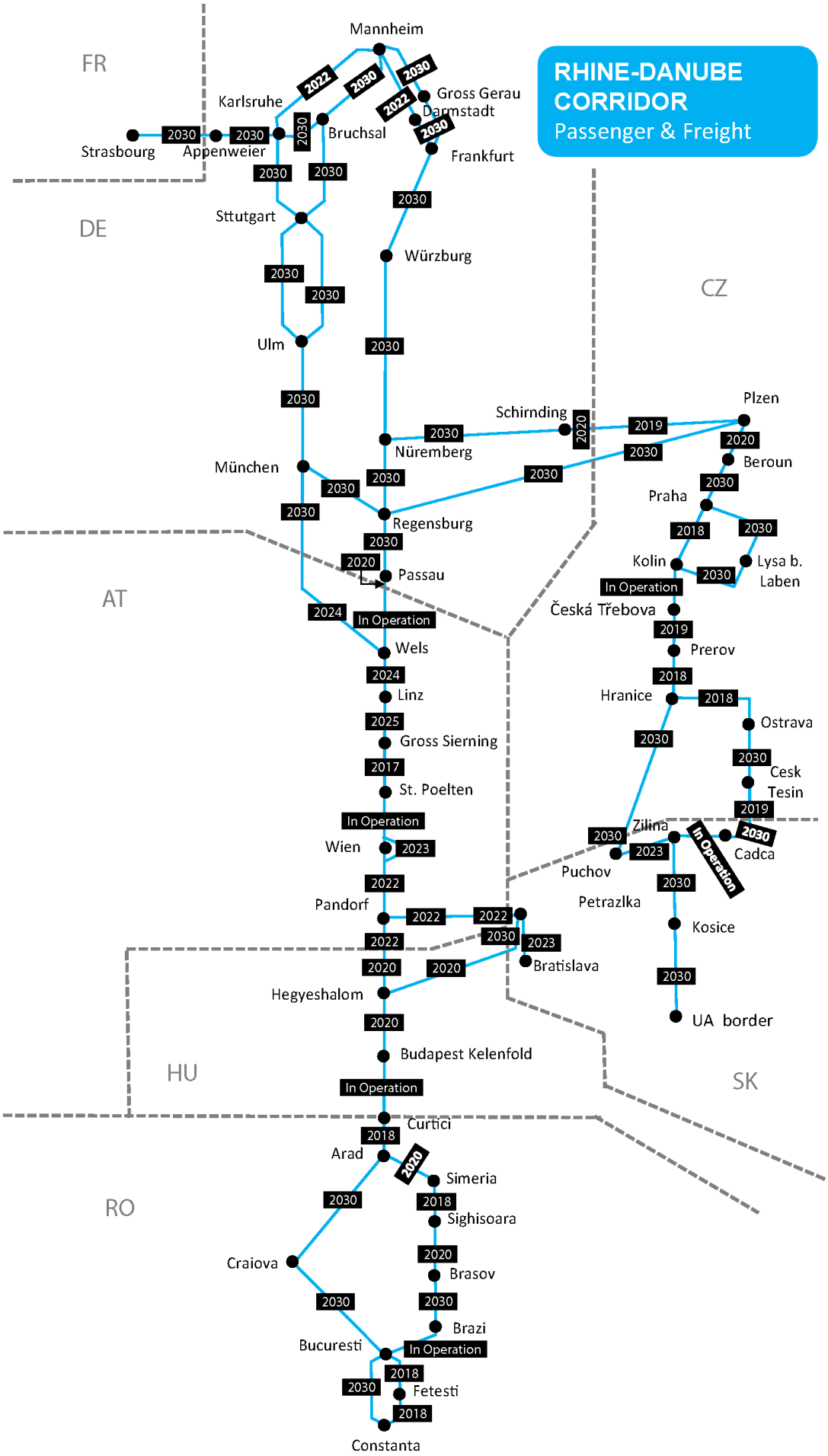


(1) The line Venlo – Viersen – Krefeld/Cologne will be equipped with ERTMS as a diversionary line by 2022. CNC line will be equipped after 2023, but before 2030.

(2) Between CH border and Novara alternative route will be equipped by 2017. CNC section by 2030.

(3) Milano Genova to be equipped by 2020 on the existing line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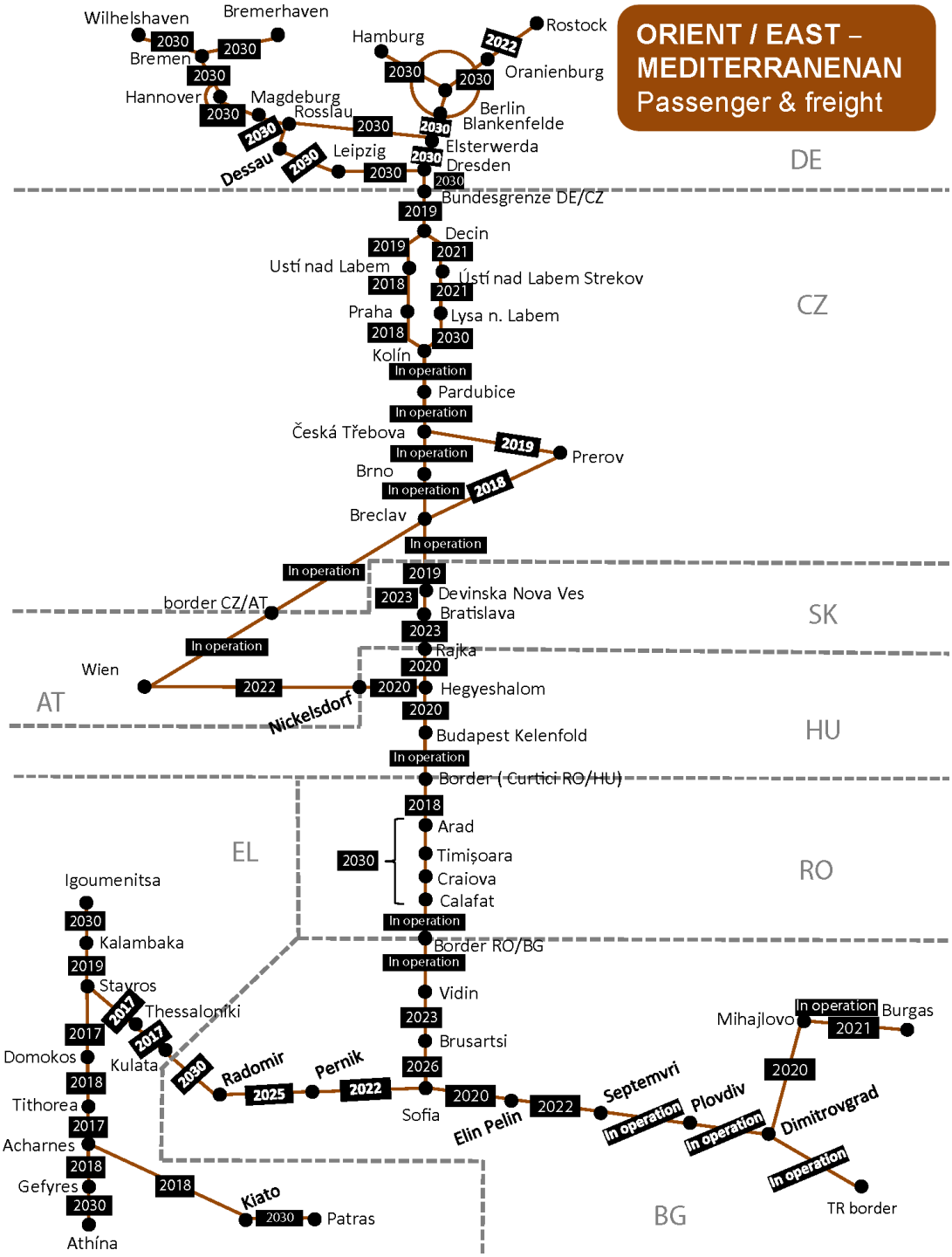
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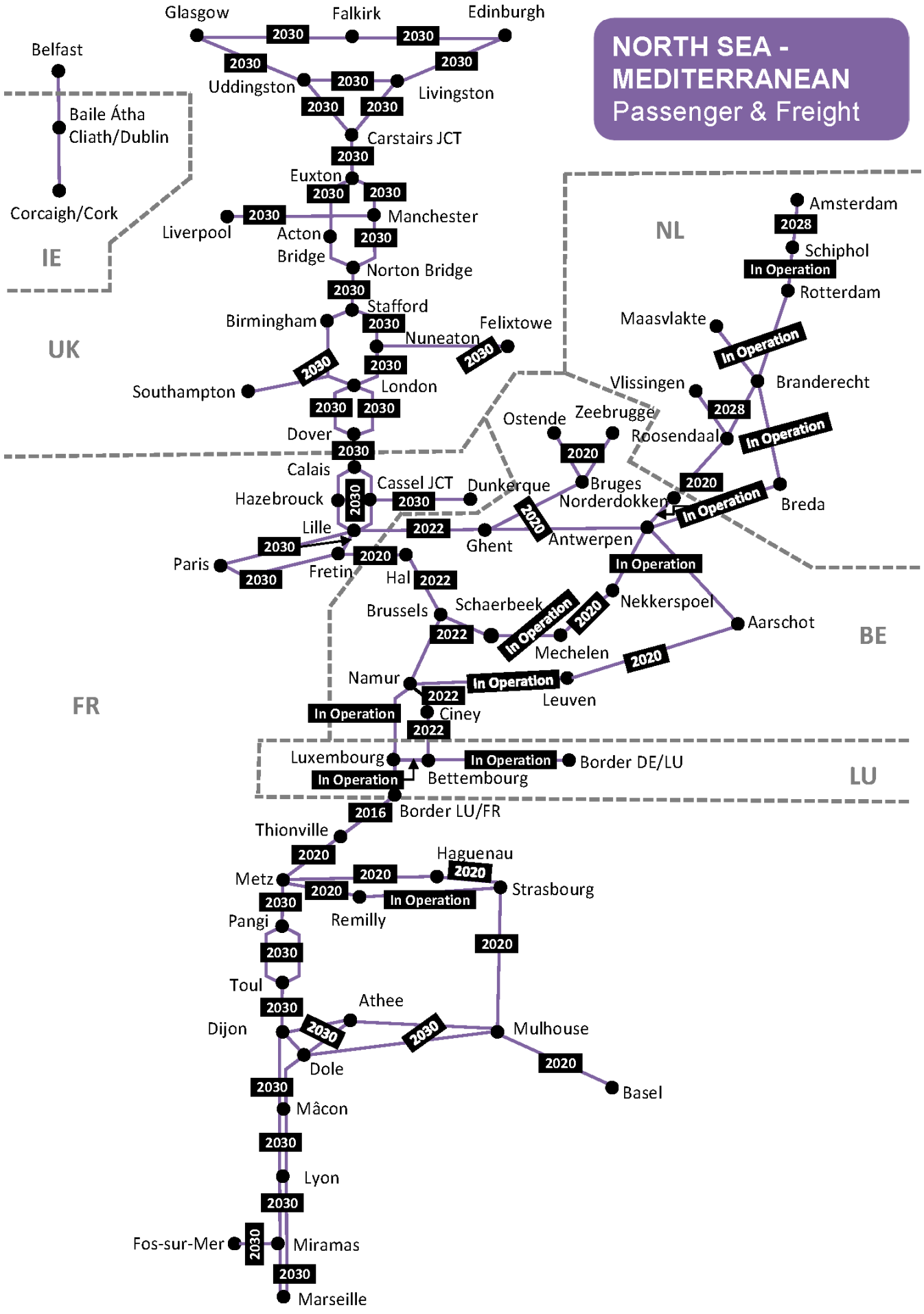
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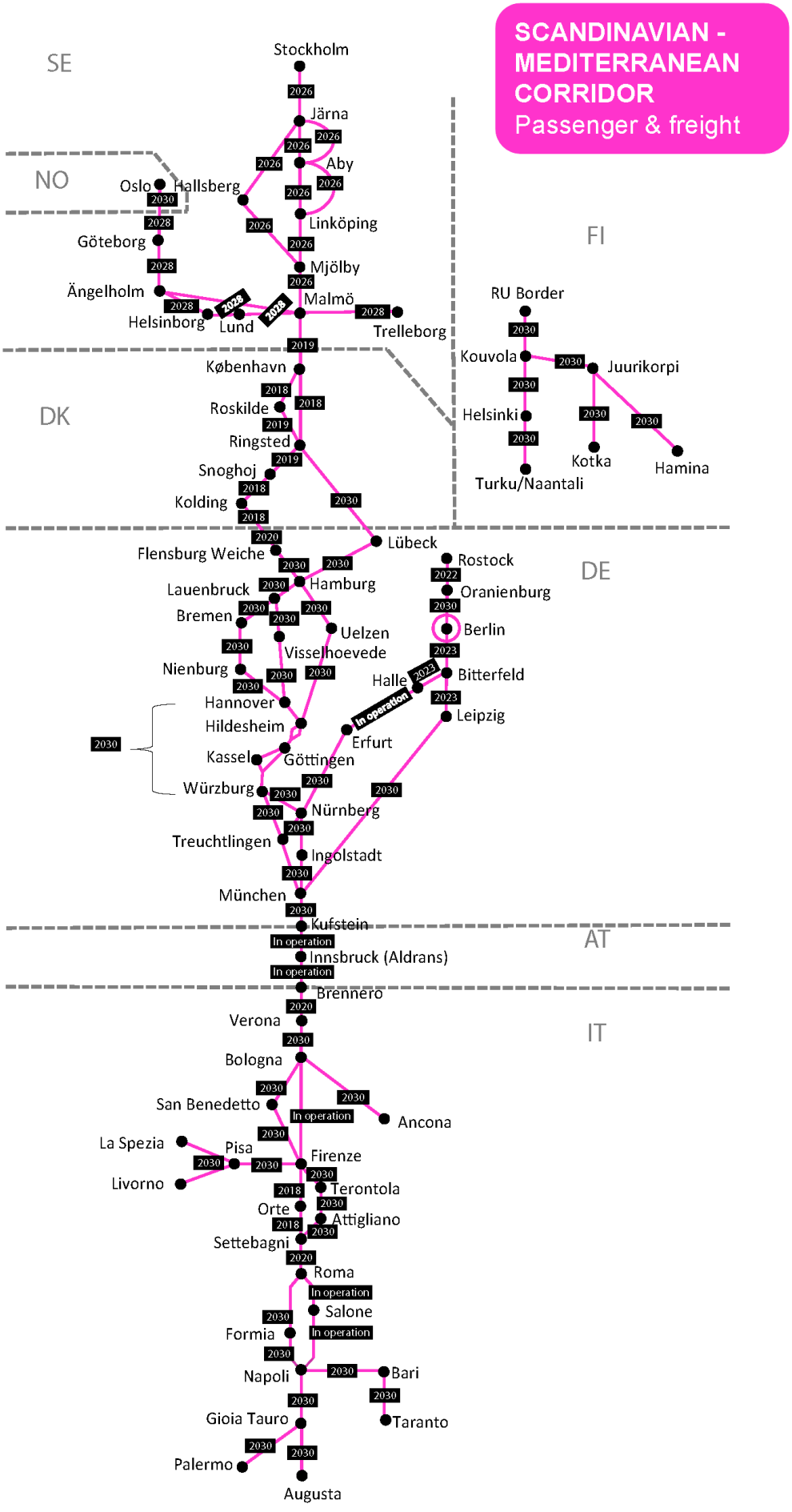
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München
Kufstein
Innsbruck (Aldrans)
Brennero
Verona
Bologna
San Benedetto
Ancona
La Spezia
Pisa
Livorno
Firenze
Terontola
Orte
Attigliano
Settebagni
Roma
Salone
Formia
Napoli
Bari
Taranto
Gioia Tauro
Palermo
Augusta
RU Border
Kouvola
Juurikorpi
Helsinki
Kotka
Hamina
Turku/Naantali
In operation
2018
2019
2020
2022
2023
2026
2028
2030

Contact details:

European Commission – Directorate General for Mobility and Transport

Directorate B – European Mobility Network

Unit B1 – Trans European Network

http://ec.europa.eu/transport/index_en.htm

email: move-info@ec.europa.eu

Offices:

Rue Demot 28

1049 Brussels Belgium

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