
# ERTMS

## Third Work Plan of the European Coordinator

## Karel Vinck

APRIL 2018

*Mobility and Transport*

APRIL 2018

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

The Coordinator received his mandate from the European Commission to facilitate and accelerate ERTMS deployment in the European Union that has been since the beginning a constraining venture for him and for the entire sector. **Significant steps have been taken** in this technically and – sometimes also - politically complex and organizationally challenging area over those years, but **we are still not there where we should be**. To ensure the ultimate success of ERTMS we firstly **identified a detailed action plan** that clearly defines how to realise the reviewed ERTMS European Deployment Plan (EDP) in a compatible and interoperable way. Secondly, those **actions must be precisely implemented by all responsible stakeholders** within the time limit defined in this plan. Thirdly, the implementation of the action plan needs to be **managed by the European Commission** that should act as an enabler and an information exchange manager and follow-up the execution of the different actions.

Furthermore, we should continue to define the success of railways through **interoperability in broader sense**. In particular in the time where the future EU budget and its share between the different policy areas is under discussion we need **tangible, short-term results** that ensure efficiency in the railways. These **'rail breakthroughs'** need absolutely to be implemented **between 2018 and 2023,** in line with the EDP, so that interoperability of the entire Core Network can be reached by 2030. We are committed to the planned achievements during the period 2018-2023 which are absolutely needed to position the Railways as an efficient, competitive and, through technical innovations an open digitalized transport mode.

## 1. Where are we now?

Over the last couple of years ERTMS has established itself as the unique signaling system in Europe with the support of all member states. This statement has been confirmed by the European Court of Auditors (ECA) as well in a performance audit carried out on ERTMS[1] which was, inter alia, analysing how efficiently and effectively the European Commission and Member States have used EU co-funding instruments for ERTMS deployment. The Coordinator welcomes this performance audit, which confirms the full acceptance and the value of ERTMS by all stakeholders as the universal signaling system in Europe. It also identifies the actual challenges and makes recommendations for immediate actions to be carried out by the European Commission and all involved stakeholders.

When looking back to the year 2015 - adoption of the Breakthrough Program for ERTMS (first Work Plan for ERTMS) [2] - and comparing the situation of ERTMS with the current one, we can clearly draw

[1] Special report no 13/2017: A single European rail traffic management system: will the political choice ever become reality? https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=41794

[2] ERTMS Work Plan of the European Coordinator, 2015, (also known as Breakthrough Programme for ERTMS) https://ec.europa.eu/transport/sites/transport/files/workplan_ertms_1.pdf

a positive balance: we managed to reach most of Breakthrough Program's objectives and to stabilize the institutional conditions for a solid implementation.

From a *deployment* point of view the adoption of a realistic and committed ERTMS European Deployment Plan (EDP) for the Core Network Corridors is clearly the most important. It sets targets dates until 2023 by which about 30-40% of rail Infrastructure in the Core Network Corridors shall be equipped. In 2023, the ERTMS EDP will be updated again setting out the precise implementation dates to 2030. The implementation of the EDP, including the critical cross-border infrastructures, is a specific action addressing the delivery of an interoperable and compliant infrastructure within this overall action plan. According the reviewed EDP about 5.500 km track side should be in operation by the end of 2017 and additional 2400 km by the end of 2018. At the end of 2018 seven cross-border sections will be operational and the final implementation of two additional ones will be laid down in an agreement signed by both infrastructure managers.

From a *technical* point of view two crucial steps were taken last year: the Commission adopted the new Technical Specification for Interoperability in June 2016 that gives legal status to the ETCS specification Baseline 3 Release 2 (B3R2) which is considered functionally complete and should be kept stable in the coming years. A stable specification permits that improvements are agreed upon by all parties and processed by the established change management process. Since the stability of the specification is frequently mentioned as the most critical element for a wide-scale deployment, the adoption of this Regulation was a major milestone in the development of the specification and of the ERTMS breakthrough program.

A specific Memorandum of Understanding (MoU) was signed between the European Commission, the European Union Agency for Railways and the European rail sector associations concerning the cooperation for the deployment of ERTMS. The main focus of this MoU is to engage the sector to deploy an interoperable system based on a stable specification B3R2. It also requires mature management of this software based system, with customers and suppliers introducing appropriate clauses for software maintenance in their contracts. Software updates are an ordinary maintenance action of complex systems, which shall not affect the functional stability of the Baseline.

Infrastructure managers (IMs) commit to include the effect of legacy systems to ensure free circulation of vehicles equipped with ERTMS, and commit to co-operate, on voluntary basis, with the requirements of the Agency for the approval of trackside projects in advance of the legal deadline of 2019. The objectives of the MoU have been endorsed by individual Stakeholders with Letters of Intent: those individual companies contribute to the newly established ERTMS Stakeholders Platform, managed at the Agency level, which is the driving force for the follow up of the deployment of the harmonized system at EU level.

From a *strategic perspective*, there is an increasing awareness that ERTMS-only lines and networks allow for substantial operational savings whilst boosting interoperability and are synergic with the deletion of redundant and/or ineffective national rules.

From *funding/financing* point of view a major step was that initial analysis indicates that there is a positive business case for ERTMS at system level on the Core Network Corridors (CNC). One of the main conclusions of this analysis was that a coordinated deployment is a key success factor for EU-wide ERTMS implementation. We are continuously developing the business cases with better

focused assumptions and models; also individual business cases are planned to be carried out. National business cases carried out for ERTMS are important for decision making on financing at national level. At the same time it is not always possible to identify a positive business case on national basis, therefore the national business cases and the business cases at Corridor level must be taken together in the evaluation of the returns.

Another important challenge for ERTMS is to explore how to attract private financing for its deployment. To analyse how and to what extent the introduction of a Deployment Fund for ERTMS on-board equipment could be feasible and useful, we contracted a study to analyse it and make recommendations with a focus on a Rhine-Alpine CNC.

The first Blending Call under CEF [3]in 2016 has been a great success too: the priority ERTMS has reached an almost four times oversubscription that we have experienced only under CEF Calls without private financing. This is a promising sign to us which can make the ERTMS deployment an attractive opportunity for private investors. Noteworthy, a proposal was submitted to fully exploit the blending potential to favor on-board ETCS Baseline 3 deployment at corridor level.

These steps are an indispensable part of a process, but still further actions are needed for ERTMS to underpin a truly interoperable network. To make the standardized ERTMS a reliable and maintainable system, a common vision and understanding, leading to a strong cooperation over many years, is expected from all stakeholders: European Commission, in particular DG Move and ERA, CNC Coordinators, rail freight corridors, infrastructure managers, railway undertakings and ETCS supply industry. Beyond the respect for the legislative framework, both at the European and national levels, we must be prepared, all together, to take all initiatives and commitments for the deployment of a truly interoperable European network.

And we need to do it now!

## 2. 2018 – 2023 – next five years of paramount importance for railways

We need a well-defined operational plan how to make the railways competitive now. It is a fact that road, aviation and inland waterways are more flexible modes and have shown to be more open to continuous technological developments that increase their competitiveness. There is no reason for Rail not to participate in the big move to take advantage of the technological innovations and to use the instruments made recently available by the work of the past years to improve in a significant way its competitive strengths. However there is an urgency to take action not tomorrow but today.

That is the reason why the reviewed EDP has identified a first phase of deployment (between 2017 and 2023) with strong commitment on delivery by the Member States and infrastructure managers. We also need to create the necessary conditions for an accelerated ERTMS deployment which will lead to fully equip the rail sections of the CNC by the end of 2030. The EDP covers only ERTMS, but we must enhance fostering the broader concept of interoperability as defined by Directive (EU) 2016/797. Interoperability does not necessarily mean 100% harmonization of every single rule between the national networks – this is not needed and would take definitely more than five years.

[3] A CEF Blending call for €1bn EU funds has been opened for financing projects across CEF objectives, in combination with EFSI funds or also with EIB, National Promotional Banks or private sector.

But we need to come to rail operations on the corridors where the trains can run with a standardized on Board equipment on a compliant infrastructure without stopping at the border for administrative or operational reasons.

Waiting another five years would put in danger the future of European railway and handicap our competitive position in a major way.

## 2.1 ERTMS Deployment Action Plan – last milestone of the Breakthrough Program

Despite the progress described above much work is still required to achieve the implementation of ERTMS that underpins interoperability, since infrastructure and on-board deployment introduced so far in Europe do not yet constitute an interoperable system. Barriers to interoperability– preservation of national rules and different engineering rules, inefficiencies in conformity assessments and authorization and homologation procedures – need to be eliminated. This is the pre-requisite for making the European railway network interoperable and through interoperability more sustainable and competitive towards other transport modes.

Building on the results of last two years and being aware of the above mentioned challenges, the European Commission recently published a Staff Working Document[4] (Delivering an effective and interoperable European Rail Traffic Management System (ERTMS) – the way ahead; hereafter 'Action Plan'), defining the measures, timing, roles and responsibilities for an harmonized, efficient and effective ERTMS deployment.

Fully implementing all actions of the Action Plan by the identified responsible units and by a given defined date is the ultimate objective. The Action Plan sets out the steps necessary to support ERTMS deployment that underpins an interoperable rail system, and provide a solid basis for accelerating the CNC deployment between 2023 and 2030.

## 2.2 Main actors of the Action Plan and their primary responsibilities

### Deployment Manager

The Coordinator firmly believes that the EDP's success largely depends on the Action Plan that needs to be steered and followed-up by the European Commission in close cooperation with the sector. The deployment manager of the Action Plan will bear the tasks of overall responsibility for the successful monitoring and controlling of the actions. The deployment manager needs to take in standpoints, to make recommendations so that the decisions taken are coherent with the overall goals and with an acceptable level of risk. His role is essential; therefore the Commission should ensure that the ERTMS Deployment Manager can act as dispatch center manager to exchange the information, and follow-up the implementation planning of all stakeholders involved till the finalization of the Action plan. A Deployment Management Team shall provide a direct support to the deployment manager in reaching his goals.

The Coordinator welcomes the nomination of the actual deployment manager European Deployment Action Plan (EDAP)

[4] Delivering an effective and interoperable European Rail Traffic Management System (ERTMS) – the way ahead
https://ec.europa.eu/transport/sites/transport/files/swd20170375-ertms-the-way-ahead.pdf

## European Union Agency for Railways (ERA)

The Fourth Railway Package is coming into force, and ERA will play a pivotal role as system authority, in approving track-side installations and authorizing vehicles, in delivering safety certificates for railway undertaking to operate EU-wide, as well as in simplifying the hurdle of around 10000 national rules that makes the EU rail so complex hindering interoperability.

*Standardised on-board unit* is one of the major objectives of the Breakthrough Program. To get there, ERA must take a dominant role in cooperation with the supply industry in the decision making process. A roadmap that shows how to reach this objective of being able to deliver the ETCS on-board unit (B3R2) by the end of 2018, must be outlined by ERA. Furthermore, ERA's responsibility to authorise vehicles as from June 2019 is another important task. ERA's role as system authority requires a solid preparation; therefore a proactive participation in learning cases before this date is crucial. ERA also needs to define and publish complete process for authorization executed after June 2019 and the process to ensure interoperability of vehicles which will continue to be authorised by the National Safety Authorities involving IM's and RU's.

ERA needs to be fully prepared for the responsibility of trackside approval that will ensure an interoperable implementation of ERTMS. In order to be ready for it, the Agency will engage with infrastructure managers in learning cases on current procurements anticipating the fourth railway package process and will define practical arrangements for trackside approval process.

Our key objective is to have *compliant ERTMS infrastructure* allowing the safe operation with an acceptable level of performance for all trains equipped with Baseline 3. This certainly applies to the already deployed track side equipment with pre-Baseline 3 specifications (Baseline 2 or earlier versions). ERA will identify existing ETCS infrastructure with issues to be resolved together with infrastructure managers and the support of European Commission. This must lead to a strategy to address infrastructure which does not currently accept Baseline 3 On-Board Unit, taking into account the financial impact of upgrade.

*National rules* are allowed, but only under the condition that they do not impact interoperability. ERA, in collaboration with Member states, is well advanced in the process of identifying, categorizing and prioritizing national rules submitted by Member States with the objective to exclude national rules hindering interoperability.

EU-harmonised *engineering rules* are available in the application guide of the TSI but they are not sufficiently used in practice. In addition in a number of Member States ERTMS implementations follow different engineering rules for different lines and projects within the same Member State. This is unacceptable in terms of interoperability. The priority of ERA is to ensure that trackside implementations follow rules harmonized at the level of the Member States, possibly differentiated between types of network. This is fundamental to allow high volume industrial deployment of ERTMS to reach the ambitious targets of the TEN-T Regulation and EDP; it will also allow ERA to issue efficient generic approvals for trackside projects.

## Railway Undertakings

Users first is the basic principle of the Breakthrough Program. Users are defined from an economic point of view: considering that railway undertakings (RU) are in a competitive situation in the market of transportation, their needs are the main, however not the sole, criteria to come to rational deployment decisions.

A key action therefore is to consider the process for addressing incompatibilities which ensures interoperability of the involved On-Board Unit and trackside, including through greater emphasis of addressing incompatibilities in a coordinated way at European level.

This implies that the standard on-board Unit is delivered on the basis of the BL3 R2 specifications, which includes backwards compatibility to appropriately modified BL2 infrastructure. The RU's should only consider in their procurement plans the purchase of the Standard OBU because it gives them full interoperability on the entire European network.

A specific problem, which is a major hindrance to equip the fleets in the European Union, is the need to retrofit the existing loco's with the standardized OBU. For the time being, there is no structured program with the suppliers to address this issue from a technical and economic point of view. This requires a common approach of RU's and suppliers during the period 2018-2023.

### Infrastructure managers

The infrastructure Managers should accept the principle of "User's first The successful implementation of the action plan is only possible with the active/constructive participation of infrastructure managers.
In particular, the early implementers are concerned that having deployed pre-Baseline 3 specifications on their network, they are now requested to adapt the interoperability of the existing equipment. Their role in reaching an *interoperable and compliant infrastructure* in close cooperation with ERA and the European Commission is decisive.

The Coordinator calls on all infra managers and the railway undertakings to sign a letter of intent with ERA committing to follow the Memorandum of Understanding (2016) in their engagement in the fourth railway package process before 2019. Their proactive engagement with ERA in learning cases will contribute to an efficient track-side approval as from 2019.

### ETCS suppliers

Operators have often reported to the Coordinator about problems with the European ETCS supply industry. Among the issues reported are:

- Already authorised products having errors, which after their correction need to be reauthorized (all costs of adaptation is billed to the operator);
- Unacceptable long periods to implement hardware and software updates;
- Exaggerated costs of retrofitting, unreliable terms of delivery etc.

The success of ERTMS and the leading position of ERTMS in the world will increase the responsibility of the industry. Strong cooperation with ERA when defining the standardised on-board unit would be the main contribution of the industry to this truly European project. The

definition of structured on-board Unit tender checklist, to be prepared by CER, is the first step in reaching this ultimate objective.

Timely availability of products compliant with the B3 specifications is a key issue.

### Need for a positive mindset

The actions identified in the Commission Staff Working Document are the ones that provide a solution for technical, operational and in some cases administrative matters. The decisive factor to reach the goals of the EPD is not technical. It is the mindset which will have a major influence.

The Coordinator urges all main actors- including the railway undertakings, the infrastructure managers, the national safety authorities and in particular the European railway industry - to take the commitment to implement the Action Plan. We cannot be satisfied with identifying problems without coming up with possible and acceptable solutions. Our basic principle in the implementation of Action Plan should be the well-known efficiency rule: focused teamwork with all the stakeholders should divide the tasks to multiply the probability of success. The success in our ambitious interoperability program is linked to the attitude of all stakeholders involved. A bad attitude is like a flat tire; if you do not change it, you will never go anywhere. On the contrary, a positive attitude which takes every stakeholder in the same journey to achieve our ultimate common goal can improve and accelerate the realization of our European Deployment Plan. They all need to leave their historical comfort zone and make significant effort to find the right way out of the existing deadlock.

## 2.3. Need for an interoperable European railway network

From a European perspective, railways have a significant added-value in contributing to EU mobility, to the internal market and EU environmental and energy policies. Rail also is crucial to deliver efficiency across transport: it is impossible to tackle congestion in densely populated areas and industrialised centres without railways. These definite benefits were the basis for the Commission to set out in the 2011 White Paper clear and ambitious objectives for rail to become the leading mode for long-distance inland freight and intercity transport. The TEN-T Guidelines define precise common, interoperable standards, a geographical distribution and deadlines that provide a clear planning method.

But is the European railway sector organized and prepared for this major change? Is it ambitious and resolute enough to become a Single European Rail Area? Currently it is not.

The complexity of moving from national systems to a more unified European system should not be underestimated, given the more than 150 years history of rail and the complex technical requirements developed on a Member State by Member State basis. However, the main hindrance in setting up the Single European Rail Area is not the major infrastructure bottlenecks, but rather the lack of interoperability between national railway networks and the different actors of the system (which is going well beyond ERTMS). There are heavy technical-administrative barriers and lengthy and unnecessarily expensive authorization procedures.

Nonetheless, the step towards interoperable European railways need to be taken otherwise railways will never become an efficient, and competitive transport mode in the multimodal transport network which is the ultimate overall objective of the European Union. The execution of the EDP will significantly contribute to these necessary and essential next steps.

## Rail breakthroughs to be implemented by 2023

When looking at rail investments, we can and we need to differentiate between long-term and short-term projects, though both types of investment participate in realizing the necessary intermodality. The implementation of Core Network Corridors is mainly through long-term, infrastructure projects (renewal of tracks, tunnels, bridges, etc.) which represent the most significant part of the allocation of the available funds. These investments require years in terms of planning, approvals, societal acceptance and realization. However, in the rail sector, there are many possibilities to reach tangible results through the execution of short-term actions requiring lower level of investments or no investments at all– through the so called 'rail breakthroughs'.

Rail breakthroughs can be identified on each CNC, if the potential of an interoperable rail infrastructure is agreed on, in particular by implementing ERTMS (as described above) and harmonizing the operational, administrative and authorisation procedures for cross-border operations. At the same time there is also a political, economic and social need to achieve results in the railway sector which are concrete and visible in a nearer future. It is essential for the railway sector to deliver tangible results now by being more competitive through better commercial terms and a more adequate service quality. .Showing by recognized results that the Rail sector is on the right way should create better chances for a continued European funding in the next programming period.

Through the Core Network Corridors (CNC) – with the support of the European Coordinators - the European Commission is trying to improve the overall mobility in Europe by optimizing the transport modes: rail, road, inland and maritime waterways and air transport. The Core Network Corridors strive for an optimal balance and seamless connection between the different transport modes that need to be equally efficient and open to continuous technical developments in order to reach the required mobility. Necessary prerequisite is a competitive railway sector, and its competitiveness is reachable only through interoperability.

Significant and measurable performance results of interoperability can be expected from the Rail Freight Corridors by using rail breakthroughs, they should be used in an extensive way to ensure interoperable railway operation across borders. The complementarity of both Core Network and Rail Freight Corridors is therefore self-explanatory, their cooperation is crucial for the European railways.

## Rail Freight Corridors – demonstration of interoperability

As mentioned above, significant and measurable performance results of interoperability can be expected from the Rail Freight Corridors that have an integrated corridor governance structure gathering all stakeholders: they are in a unique position to identify and implement the most urgent and efficient rail breakthroughs along their corridors..

Currently nine RFC's are operational, but their definition of priorities, achievable efficiency and way of working vastly vary: breakthroughs have been regularly discussed with some of the RFC's, but the actions taken have been limited in scope. Since interoperability results can be proven on rail freight corridors; it is essential that rail breakthroughs are identified, prioritized, evaluated from economic point of view and implemented by them as soon as possible.

### ERA – monitoring of interoperability

The European Union Agency for Railways (ERA) has been set up by the European Commission with the aim to contribute - on technical matters - to the implementation of the European Union legislation in the rail sector, by a.o. enhancing the level of interoperability of rail systems. Considering that Core Network Corridors and Rail Freight Corridors not being tasked with technical matter close and regular cooperation between ERA and RFC's is prerequisite to avoid duplication of work and for a successful and compliant implementation of numerous rail breakthroughs.

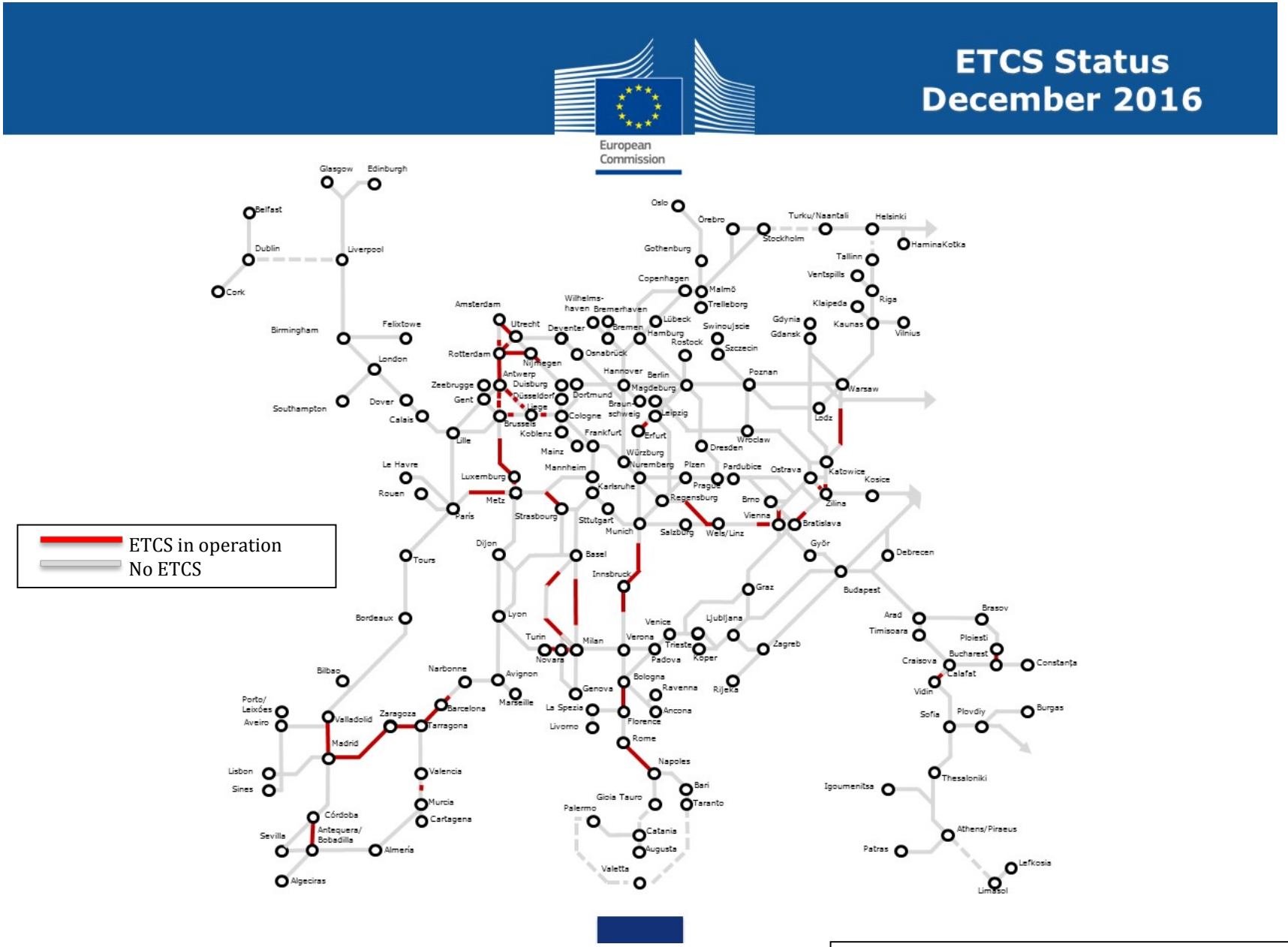
### Political responsibility of the European CNC Coordinators

European CNC Coordinators can and have to play an eminent role in achieving rail breakthroughs on their Corridors. Consequently, European CNC Coordinators have expressed their support to implement the rail breakthroughs on their respective corridors. This requires close cooperation with the Rail Freight Corridors. The CNC Coordinators should use every opportunity to further strengthen the strategic position of the Rail Freight Corridor in the involved Member States and provide the necessary, high-level political support to the RFC's, so that they are able to implement the identified rail breakthroughs..

## Recommendations

- The Coordinator urges all main actors- including the railway undertakings, the infrastructure managers, the national safety authorities and in particular the European railway industry - to take firm commitment to implement the Action Plan. Its timely implementation is absolutely fundamental for success of ERTMS: all involved stakeholders have to execute the action assigned to them within the given time frame.
- European ETCS supply industry should be committed to improve its performance in delivering qualitative products or retrofitting existing equipment at competitive costs as soon as possible. They need to be aware that the competitors are getting more interested in the European market potential than ever before.
- ERA needs to be prepared for its enhanced responsibility as authorizing authority as of 2019: it needs to organize itself and make the necessary preparatory works on the one hand, and on the other hand, it needs to be ensured that sufficient skilled staff resources is available for this work.
- Rail Freight Corridors are playing an extraordinary role in interoperability implementation. The Coordinator urges all Member States and infrastructure managers participating in Rail Freight Corridors, and ERA to resolve commonly the most significant interoperability obstacles in the time frame of 2018-2023.
- The European Commission needs to structure its future CEF Call(s) still before 2020 in a way that sufficient funding can be made available for 'rail breakthroughs'.

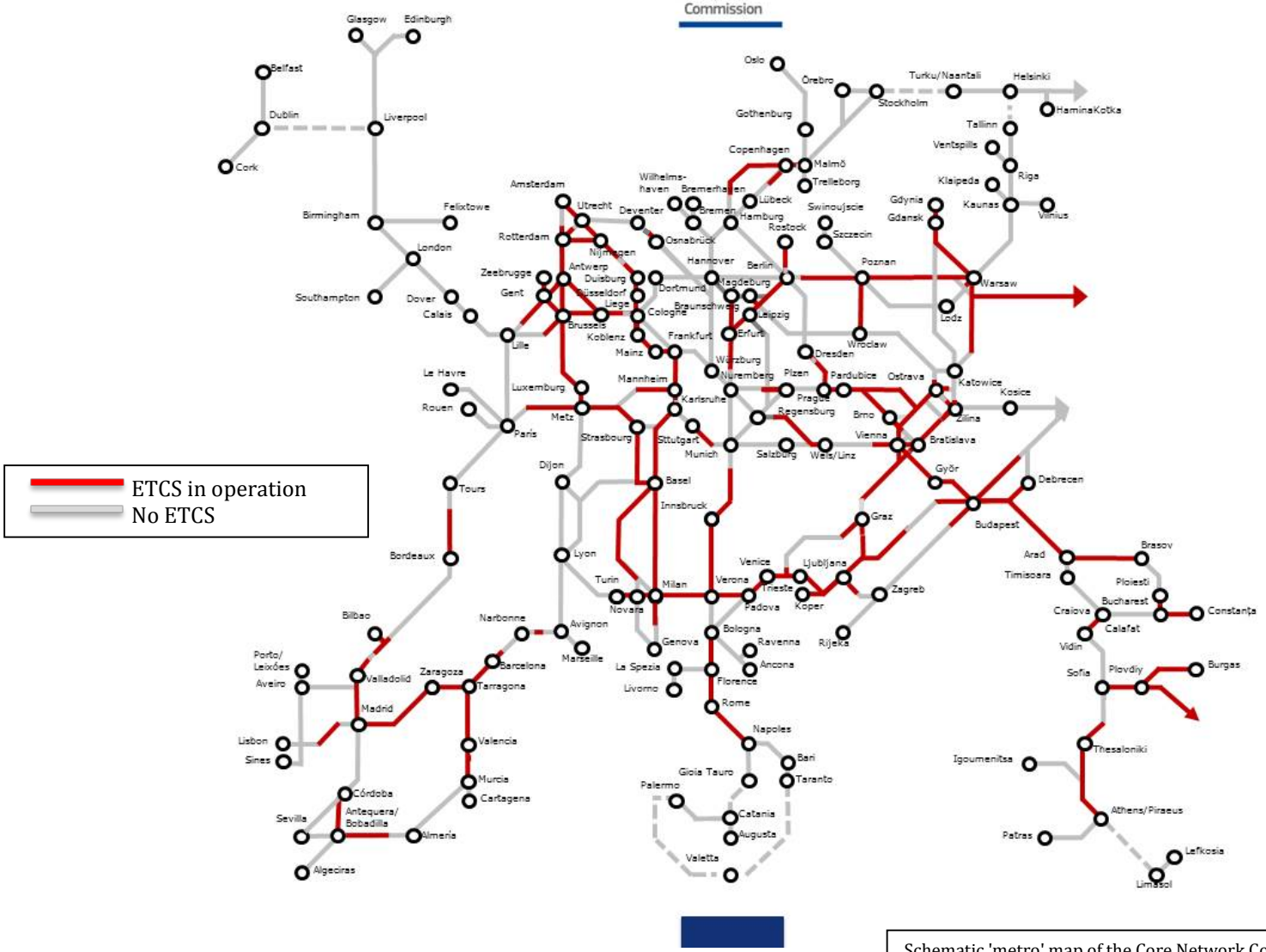
Annex:




Schematic 'metro' map of the Core Network Corridors for purely visualization purposes. It is not intended to reflect perfectly the maps of the ERTMS EDP, but the information on status of implementation is based on this Commission Implementing Regulation for the dates 2016 and 2023.

# ETCS Status year 2023

European Commission

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**Contact details:**
European Commission – Directorate General for Mobility and Transport
Directorate B – Investment, Innovative & Sustainable Transport
Unit B1 – Transport Networks
http://ec.europa.eu/transport/index_en.htm
email: move-info@ec.europa.eu
Offices:
Rue Demot 28
1049 Brussels, Belgium

Design & Layout by TENtec