Technical support for the Deployment of ERTMS along the core network corridors

# Deployment & Management of ERTMS Projects

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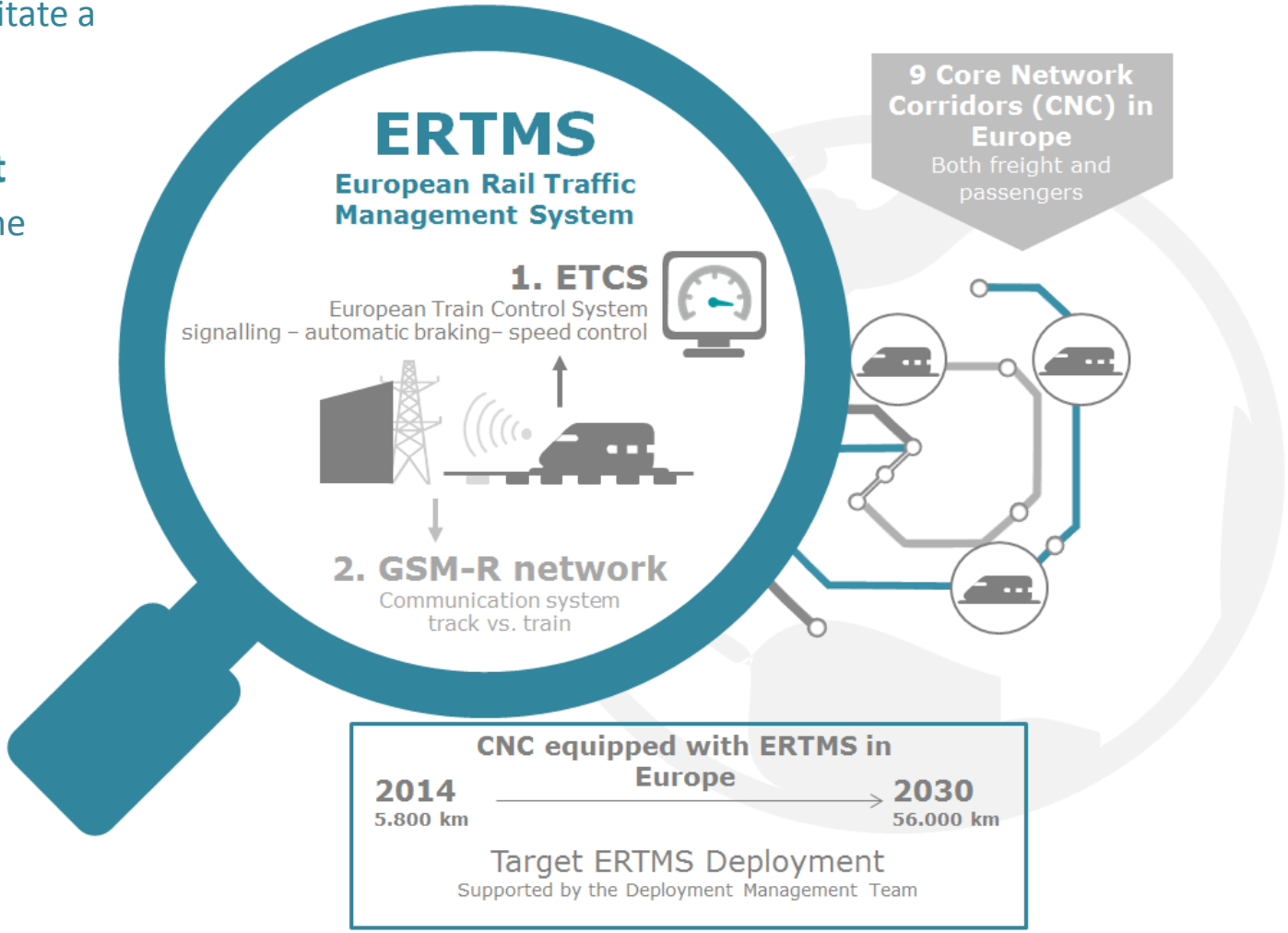
The main objective is to provide technical assistance and support to the beneficiaries of the EU ERTMS co-funded projects (or any other ERTMS deployment project) in order to facilitate a **successful interoperable ERTMS deployment in Europe and supporting them to achieve that the mandatory deliverables** of the funded actions are complete



# Roles of the European institutions regarding ERTMS deployment

## European Commission

- Defines funding instruments
- Defines call requirements and priorities

## INEA

- Publish and manage calls
- Selects projects
- Establishes Grant agreements
- Decision on payment

## ERA

- Provides the technical opinion on the FPC of the projects
- Coordinates technical follow up of EU funded projects by DMT

## DMT

- Supports beneficiaries to identify the project technical deliverables
- Provides a technical assistance in understanding the EU legislations and to avoid deviations from the TSI
- Produces technical reports to support the ERA technical opinion

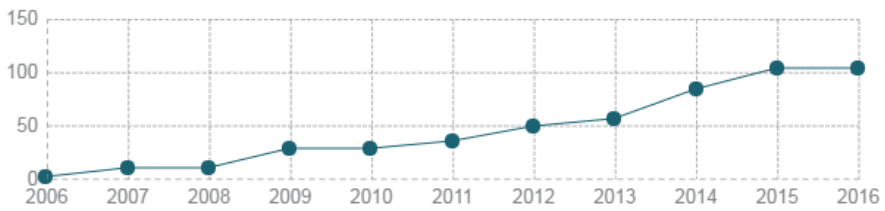
## Data to the Technical Follow up of TENT / CEF funded projects

**873**
Documents analysed in detail from over 3900 documents received

**88**
Meetings with different projects

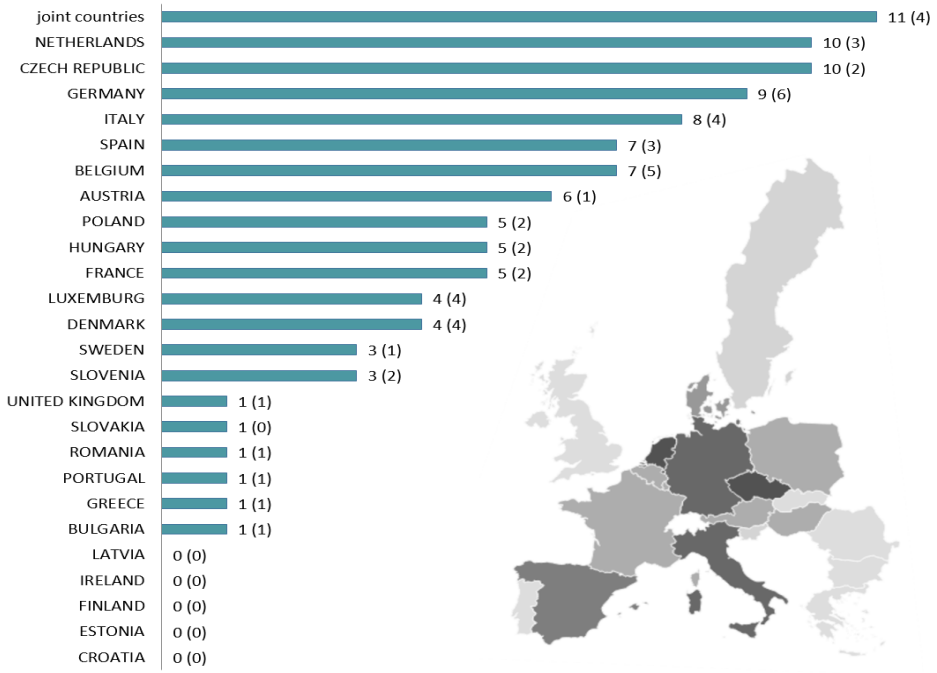
**295**
Analysis project progress reports produced

## Number of projects that have been followed throughout the different TEN T /CEF calls

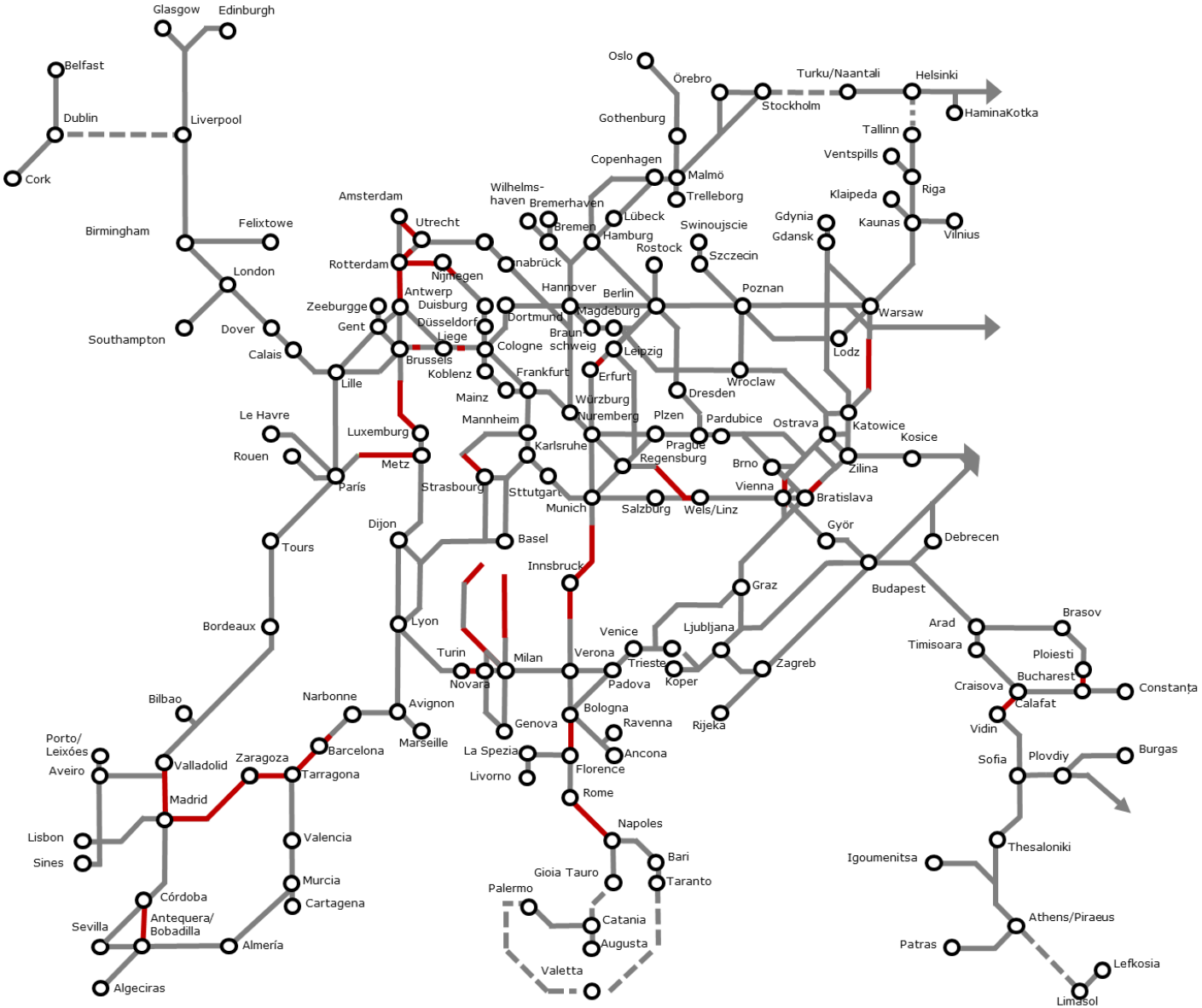



103 projects followed

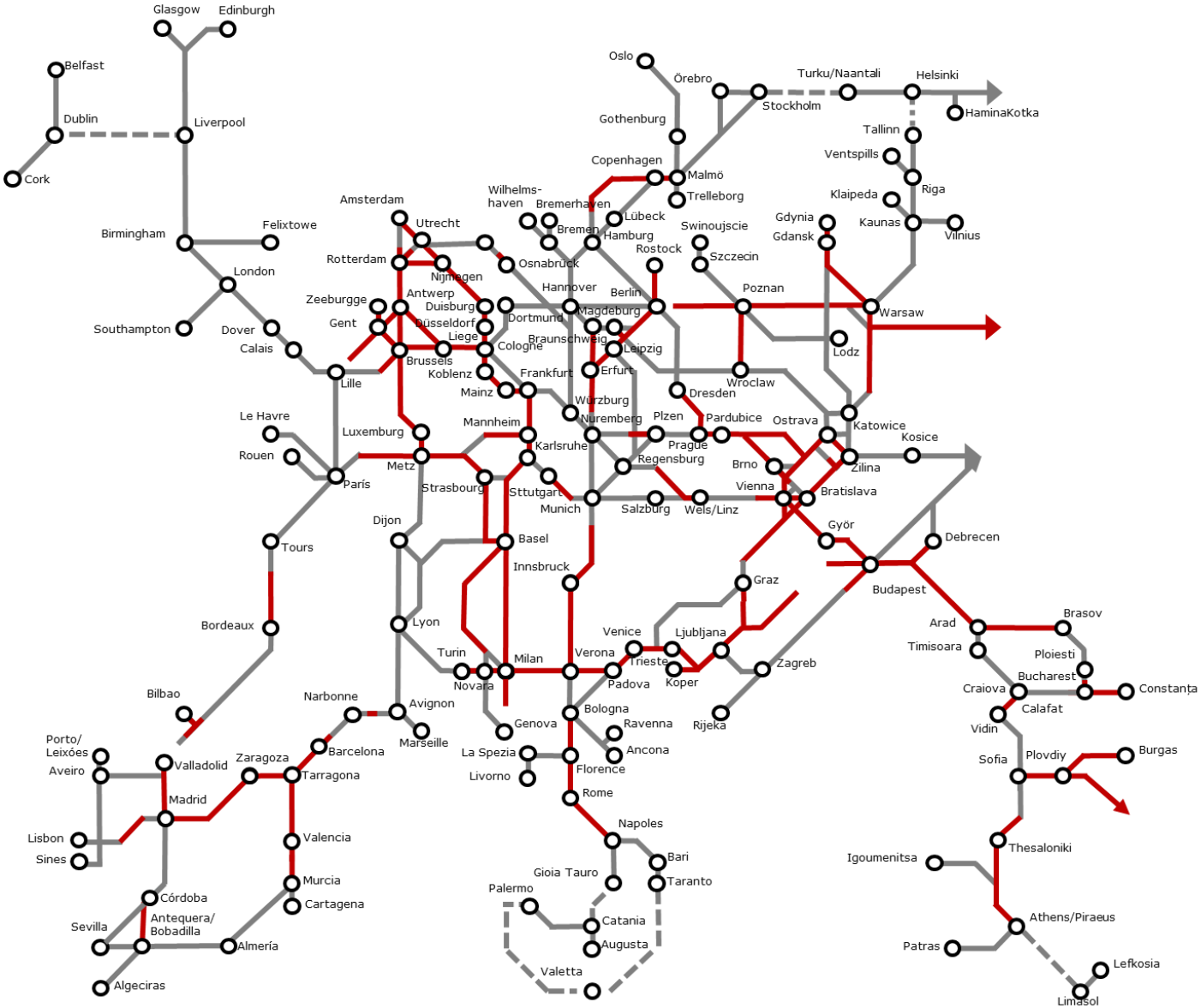
This work enables the DMT to establish a direct contact with different ERTMS projects throughout Europe. The gathered information has been used to provide a specific **return of experience** to the Commission, ERA and INEA and **to disseminate lessons learned from successful ERTMS projects** to all the rest of deployment projects around Europe.



# ETCS Status year 2016



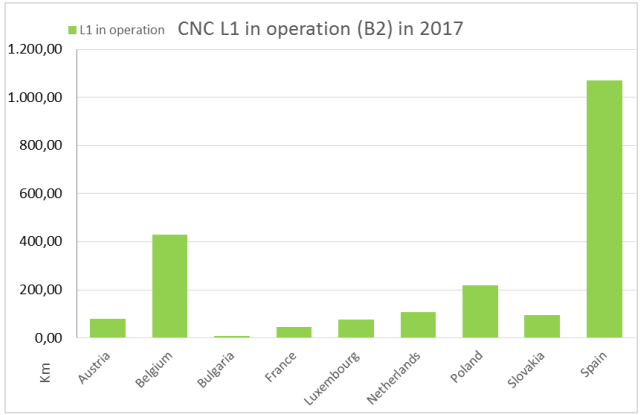
# ETCS Status year 2023



# Current ETCS deployment by levels

## Current ETCS L1 implementations in Operation

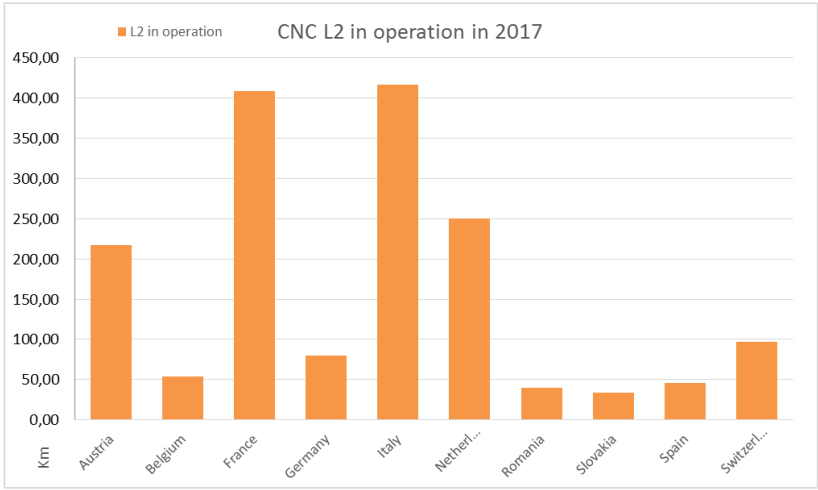
AT, BG, BU, FR, LU, NL, PL, SI, SP




Note: Actually BU and HU have sections equipped with L1 ERTMS with preBaseline 1

## Current ETCS L2 implementations in Operation

AT, BE, CH, DE, FR, IT, NL, RO, SI, SP, CH



# Future ETCS deployment by levels

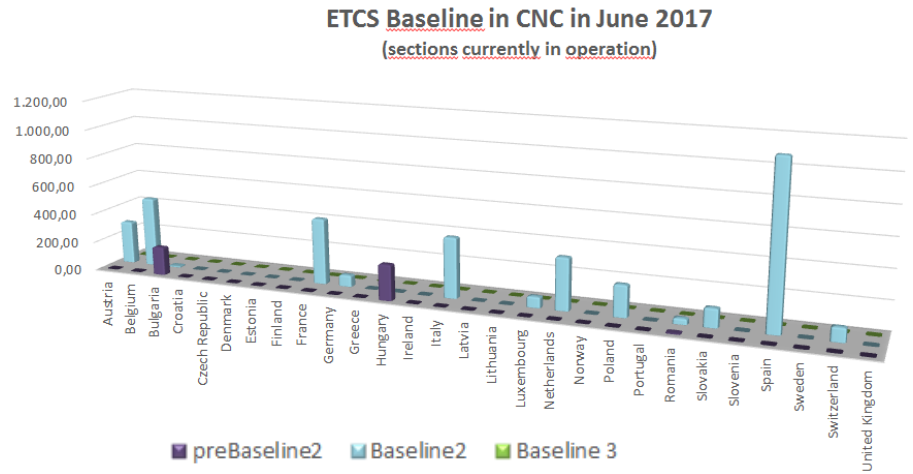
## ETCS L1 planned in CNC by 2030

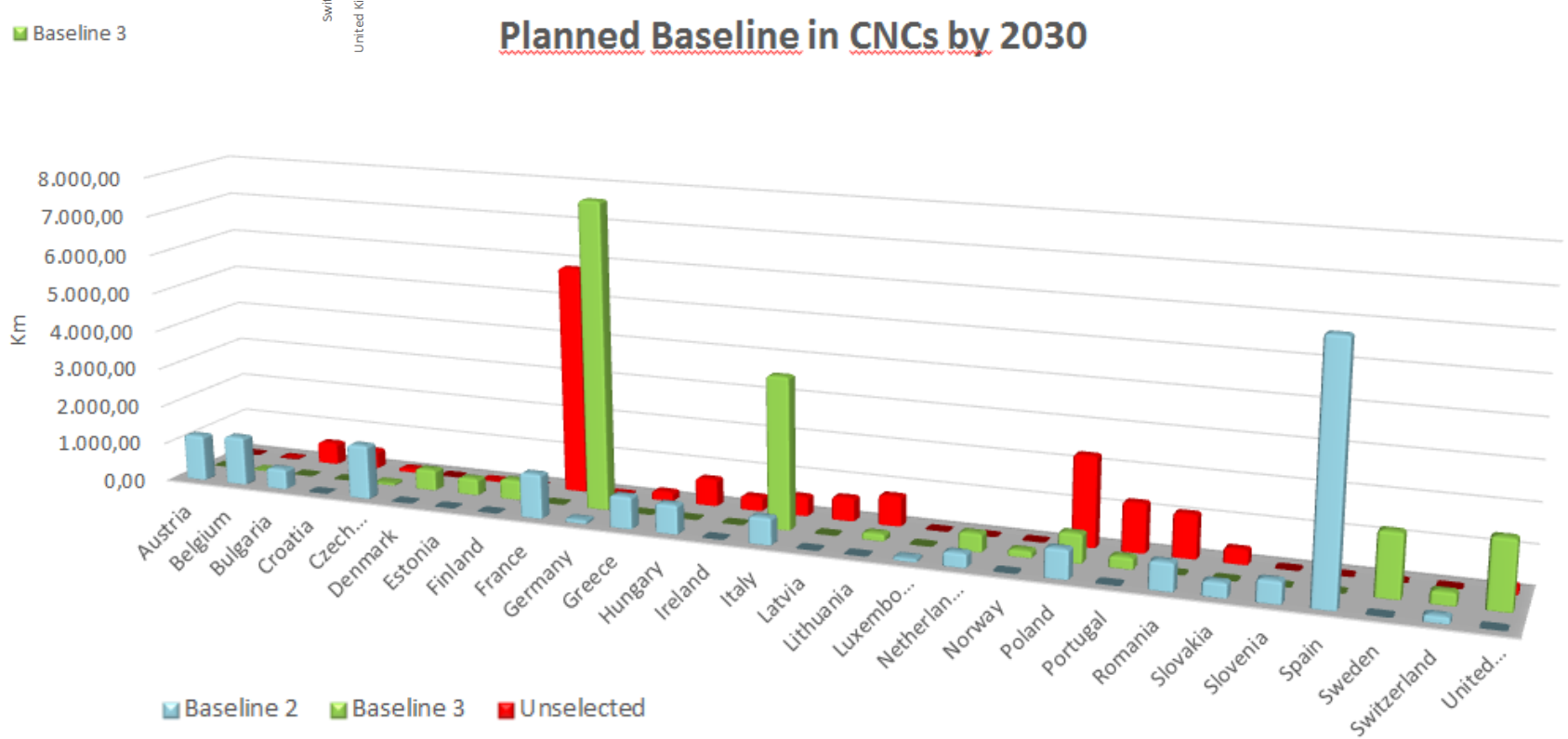
AT, BE, BU, HR, FI, FR, DE, EL, IT, LU, NL, PL, RO, SI, SK, SP, CH

## ETCS L2 planned in CNC by 2030

AT, BE, BG, CZ, DK, ES, FR, DE, HU, IT, LT, LV, NL, NO, PL, PT, RO, SK, SP, SW, UK, CH

# ETCS deployment by baselines



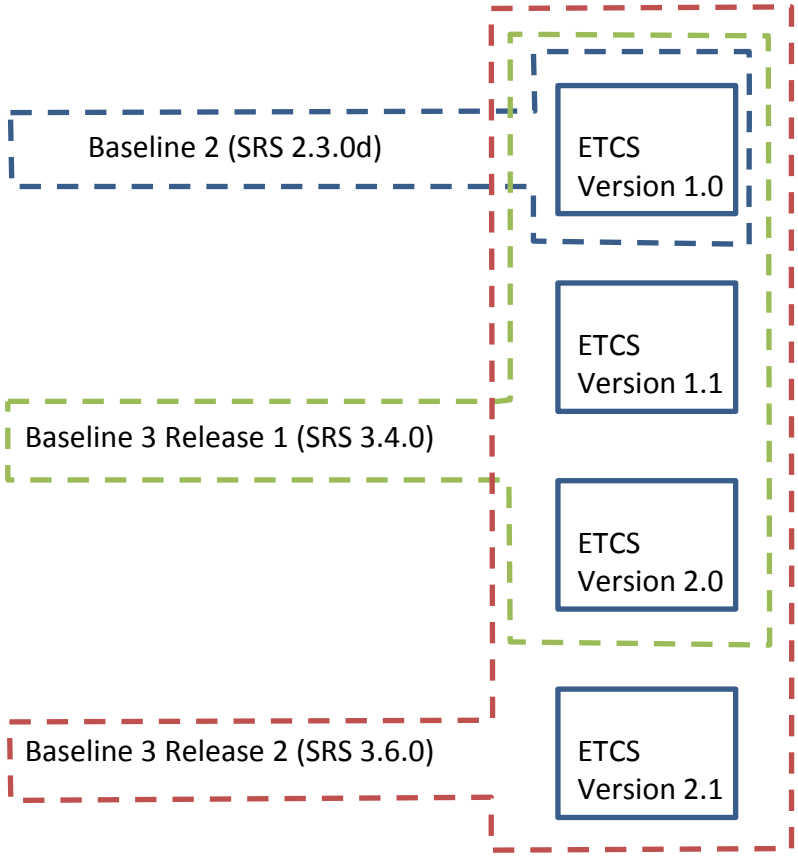



# ERTMS Baselines vs. ETCS version

A baseline is a set of documents with a concrete version that are listed in the TSI CCS, i.e. the specifications of many aspects, components, interfaces, etc. concerning ERTMS

The Baseline of a project corresponds to the version of the technical specifications designed and validated for this project.

- ✓ Baseline 3 is required for new ETCS on-board projects.
- ✓ Baseline 3 is recommended for new ETCS trackside projects. **(mandatory for eligibility in the open blending call)**
- ✓ Baseline 3 for trackside ETCS has 2 different system versions (X=1 & X=2).
- ✓ Baseline 2 onboards can run in a Baseline 3 X=1 trackside




The Baseline compatibility assessment reports analyse:

- the delta between Baseline 2 (2.3.0d) and Baseline 3 MR1 (in the first report),
- the delta between Baseline 3 MR1 and Baseline 3 R2 (in the second report),

and in both cases considering backwards compatibility for each individual change identified by a CR. Both BCA reports also include the mitigation measures proposed for the concerned trackside, i.e.: B3R2, B3MR1 and B2 networks in order to cover the shortcomings detected in 2.3.0d and Baseline 3 MR1

## In June 2019:

**Applicant submits request for approval for an ERTMS trackside project**

Including requested documentation

Including evidences that issues are controlled and will be resolved

**Agency issues a decision on approval**

Within 1 month it will inform applicant of completeness

When complete, or at the agreed deadline, the Agency will make decision

**NSA authorizes the project including the ERTMS trackside subsystem**

Approval is a precondition for the authorization by the National Safety Authority

## 2018, the EC recommendation on the ERTMS trackside approval will be published

## Currently ongoing, learning cases already launched in order to review and improve the recommendations (practical arrangements, application guides, agency internal procedures

## 2016-early 2017, Workshops with the sector for the trackside approval and launching the learning cases

## Draft Commission Recommendation on guidance for the harmonised implementation of the European Rail Traffic Management System in the Union

(6) That the applicant submit at the earliest stage possible, via the one-stop shop, the following application file necessary for the approval, including the description of the technical envisaged solution and the documentary evidence of the compliance of the technical envisaged solution with the relevant control-command and signalling TSI:

Description of the envisaged technical solution

(a) Project description, including the details of the line, group of lines, or network that are covered by the project or combination of projects: geographical location, number of kilometres in single and double track, ERTMS level, baseline and version, interoperability constituents and stations;

(b) Evidence that the tender or contract or both include the relevant control command and signalling TSI, the baseline and the version;

(c) Project plan indicating deliverables, milestones and deadlines;

(d) List of ERTMS functions to implement;

(e) Engineering rules and operational tests scenarios, as referred to in Article 5 of Regulation (EU) 2016/919 and point 6.1.2.3 of the Annex to that Regulation;

(f) Test strategy and test plans;

(g) National rules related to ERTMS that are applicable to the project;

(h) Information of the vehicles intended to operate on the relevant network;

(i) In case the applicant has an exemption from the application of one or more TSIs or parts of them, a document provided by the Member State or by the Commission granting the derogation, according to Article 7 of Directive (EU) 2016/797;

Documentation or documentary evidence of the compliance of the envisaged technical solution with the relevant control-command and signalling TSI:

(j) If available, EC Certificates of conformity of the interoperability constituents and EC declaration of conformity of the interoperability constituents, including the Agency template for certification and deviations defined in the Agency guideline;

(k) If available, Certificates of verification of the subsystem and, if applicable, intermediate statements of verification of design and EC declaration of verification of the subsystem, including the template for certification and deviations defined in the relevant Agency guideline;

(l) Demonstration of addressing the Demonstration of how the risks impacting interoperability of each issue of the issue log have been addressed;

DRAFT

# Examples on the issue log currently under learning phase

Issues are items with a potential to harm interoperability or to necessitate a re-engineering. The issues comes from real experiences from previous ERTMS projects

- The Agency will make a list of issues collected from previous projects available
- For Item "(l) Demonstration of addressing the risks to interoperability of each issue of the issue log", the Applicant should provide evidences that the technical issues in the issue log are controlled and will be resolved

## Level transitions

**Entry location determination**

- **How is the entry location determination engineered?**
- **Is the MA sent in advance of the transition? If so, how is the engineering performed to protect if there is a change/dissolution of the route?**
- Is a pre check or a post check solution implemented? In both cases are there requirements for the timing on the onboard to send the position report?

**First entering train determination (L2)**

- (for exit from L1/L2) is an EoA with overlap MA used or is the transition performed through VLOA
- (if entry to L1/2/3) at which point is the MA sent to the train?

**Authorisation across the ETCS border**

- What is the ETCS information engineered in transitions to ETCS L1 or to ETCS L2 in case the transition is performed at a signal with stopping aspect?
- In transitions from level STM to L1 or L2 ETCS, do both the ETCS and the STM trackside systems provide coherent information regarding a stopping aspect of the signal at the border?
- What are the engineering provisions for the execution of the level transitions in modes different that FS?

**...**

- ...

## Basic principles to avoid technical interoperability risks:

**01**

Activities towards a successful and interoperable ERTMS project should start from the tender design

**02**

aim for 100% compliance, and ensure a transparent dialogue with NSA in case of any deviation, and reporting to EC/ERA

**03**

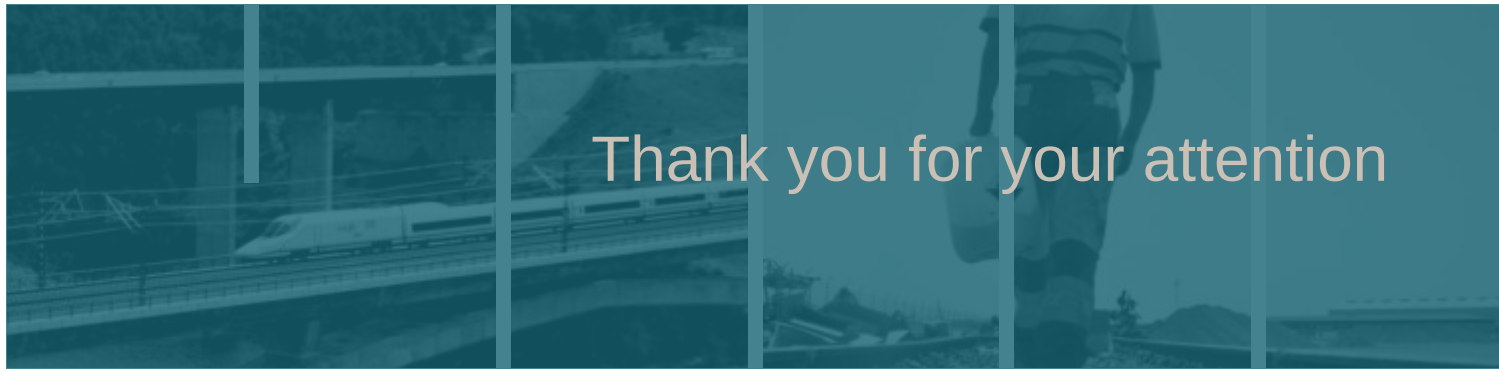
For trackside projects, it is crucial to identify and make available the necessary information to allow the operation of the line

**04**

Complete documentation throughout the project, from the design to the authorization and operation, optimises the project results and facilitates EU funding for the selected projects

**ERTMS can be deployed everywhere while ensuring compatibility between networks and the rolling stock equipped with ERTMS**

***Contact and direct technical assistance from the Deployment Management Team to the projects deploying ERTMS will aim for a more synchronized, interoperable and timely implementation of the ERTMS***

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