



ERTMS deployment trackside and onboard in Europe

Matthias Ruete
European Coordinator for ERTMS

Steering group meeting of Digirail projects
Helsinki, 1 June 2023



@Transport_EU

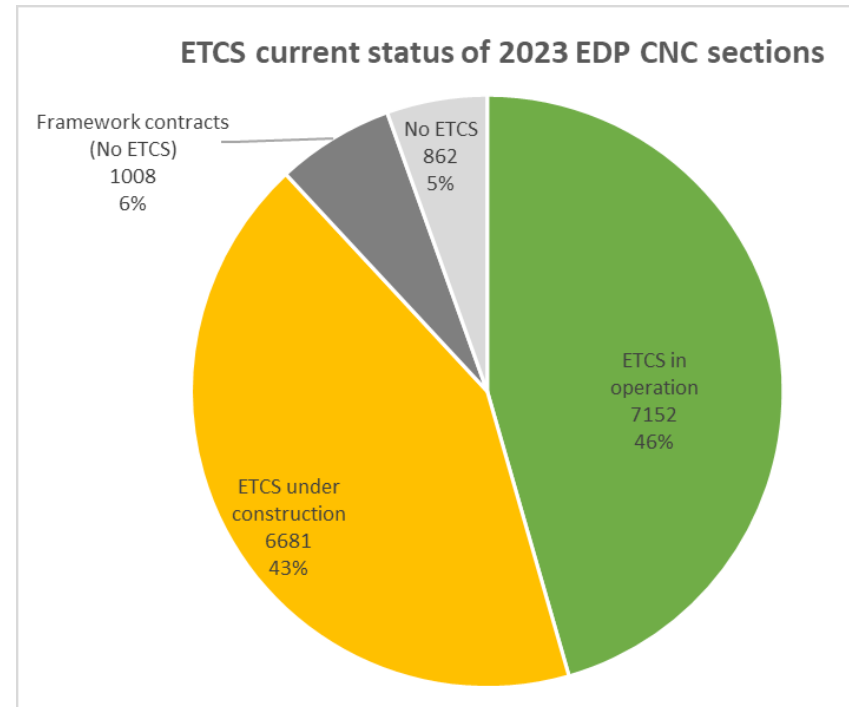
Mobility and
Transport

CONNECTING
EUROPE

Most CNC lines scheduled under the EDP for 2023 are operational or under construction

Trackside ERTMS covered by EDP – State of play

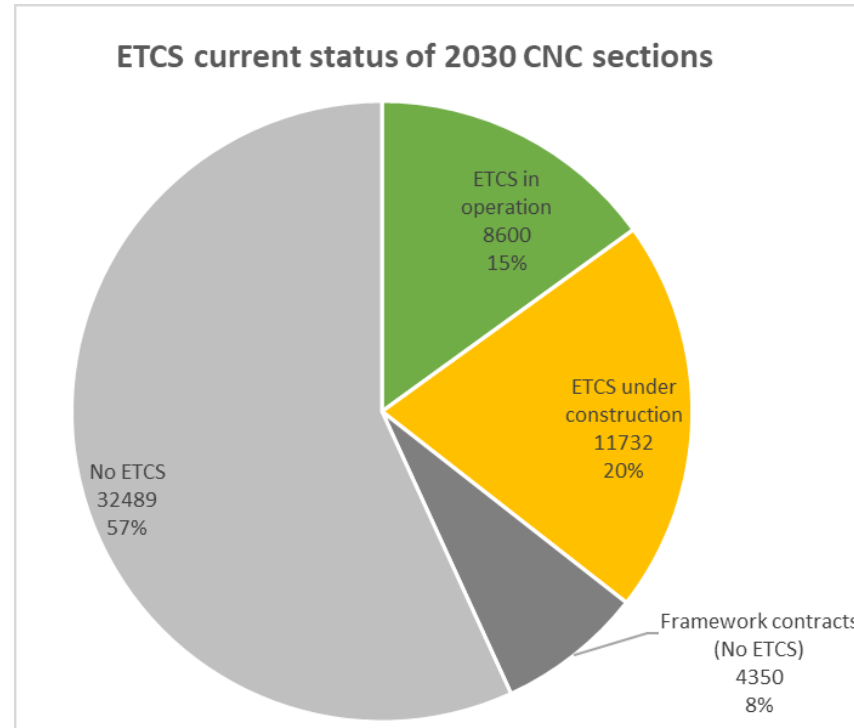
- The majority of CNC lines scheduled for 2023 (EDP – Total 15,703 km) are in operation or under construction (but with some delays).
- By Q2 2023, ETCS was deployed on **46%** of the lines of the CNC expected to be equipped by 2023
- Additional **49%** are covered by contracts (including framework contracts).
- Most of the lines are delayed by some 3 years.



The deployment on the CNC lines scheduled for 2030 is also taking momentum

Trackside ERTMS – State of play

- The deployment on the lines scheduled by 2030 (CEF 2 alignment - **Total 57,170 km**) is **also gradually taking momentum**. This regards also new lines included to the CNC under **CEF2**
- By Q2 2023, ETCS was deployed on **15%** of the lines of the CNC expected to be equipped by 2030
- Additional **28%** are covered by contracts (including framework contracts)
- It is estimated that at least 70% of the CNC should be equipped with ERTMS by 2030.



CNC Lines commissioned in 2022

Line	MS	CNC	Km
Libramont - Y.Autelbas	BE	NSM	51,87
Y.Sint-Mariaburg - Essen	BE	NSB - NSM	20,56
Visé - Bressoux	BE	RALP	14,62
Nykobing F - Vordingborg	DK	SCM	29,30
Border BG/EL (Kulata/Promachonas) - Thessaloniki	EL	OEM	163,67
Madrid Chamartin - Madrid (Puerta de Atocha)	ES	MED - ATL	8,00
Madrid-Puerta de Atocha - Bif. Torrejon de Velasco	ES	MED - ATL	29,27
Rovezzano - Firenze Statuto	IT	SCM	3,52
Monza - Chiasso	IT	RALP	38,41
Rho - Novara	IT	MED	33,48
Zidani Most - Border SI/HR (Dobova/Savski)	SI	MED	51,21
TOTAL			443,92

ETCS deployment status on CNC in Q2 2023

- Still more a patchwork than the network.
- Some sections are deployed partially or without the nodes.
- Several countries go for a network-wide deployment.
- There are many more lines outside CNC thus that are not depicted on the map, especially in BE, CH, CZ, DK, IT, NL, NO, SL.



Expected ETCS status by 2040 according to the national plans



11 countries will have achieved full network coverage, and in total **no class-B** system will be required onboard in **14 countries** (question mark Sweden that might delay the network-wide deployment beyond 2040)

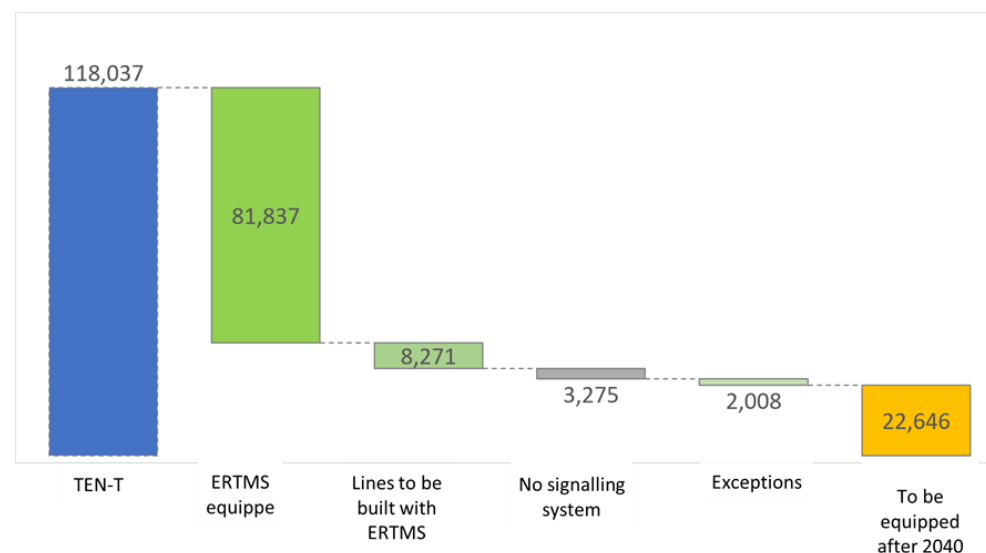
- ETCS in operation by 2040 – Core Network
- ETCS in operation by 2040 – Comprehensive Network
- No ETCS operation – Core Network
- No ETCS operation – Comprehensive Network
- No ETCS operation, new construction – Core Network
- No ETCS operation, new construction – Comprehensive Network
- No ETCS operation without train protection system – Core Network
- No ETCS operation without train protection system – Comprehensive Network

By 2040 the vast majority of the TEN-T Network and beyond will be equipped. A number of Member States will have equipped their whole network by then.

Trackside ERTMS – Outlook

- **By 2040**, the majority of the TEN-T network will have been equipped.
- Given national plans, by 2040, **less than 20% of the TEN-T Network will still require class B system onboard to run.**

Expected ERTMS trackside status by 2040²

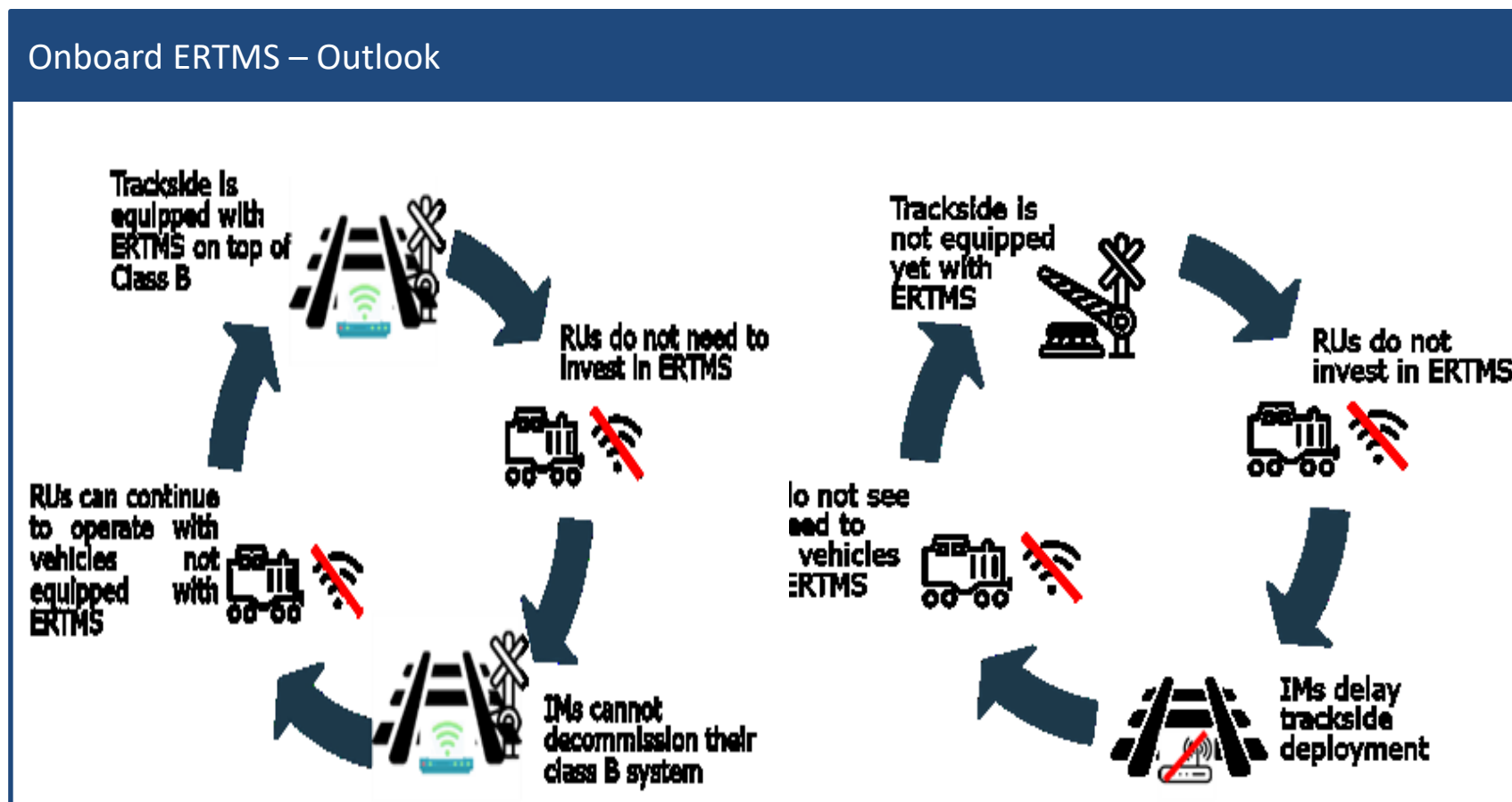


Onboard deployment has been lagging behind

Onboard ERTMS – State of play

- Keeping class B system trackside for a prolonged time is costly and complicated.
- In order to decommission Class-B systems, the rolling stock has to be equipped on time.
- It appears **that less than half of the new vehicles** put on the market prior to 2020 had been equipped with ERTMS due to existing exemptions.
- This is to be fixed by the CCS TSI 2023.
- The progress has been slow, but it seems that the deployment is also gaining momentum.
- The key issue is to break the ERTMS vicious cycle.

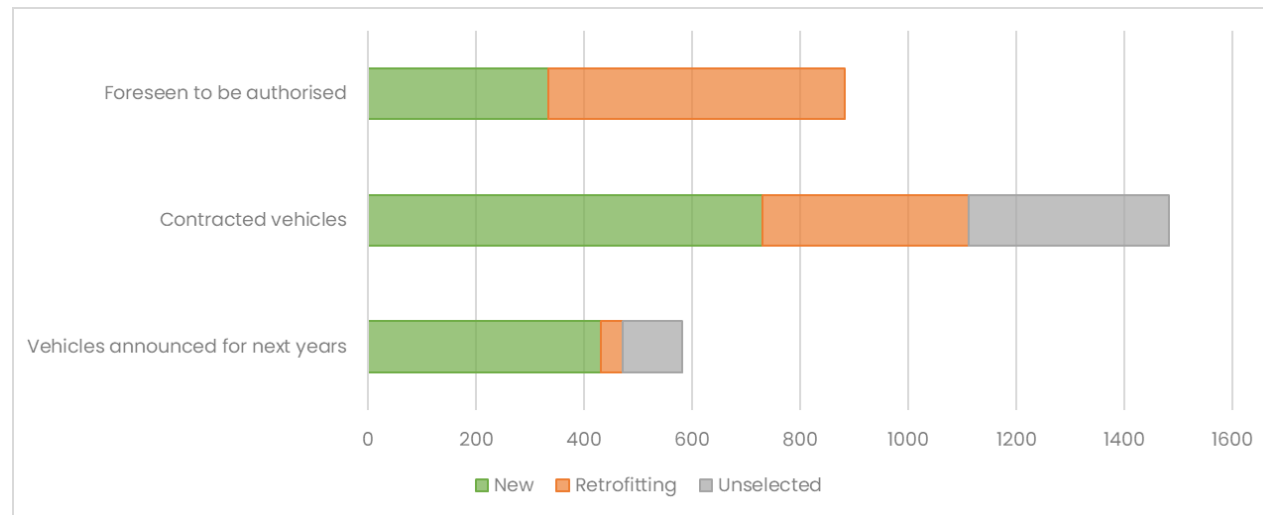
Operators do not fit or retrofit their fleet since they do not see the need to invest in ERTMS: the lines in their area of operation are not yet equipped with ERTMS and/or they can still use class B systems.



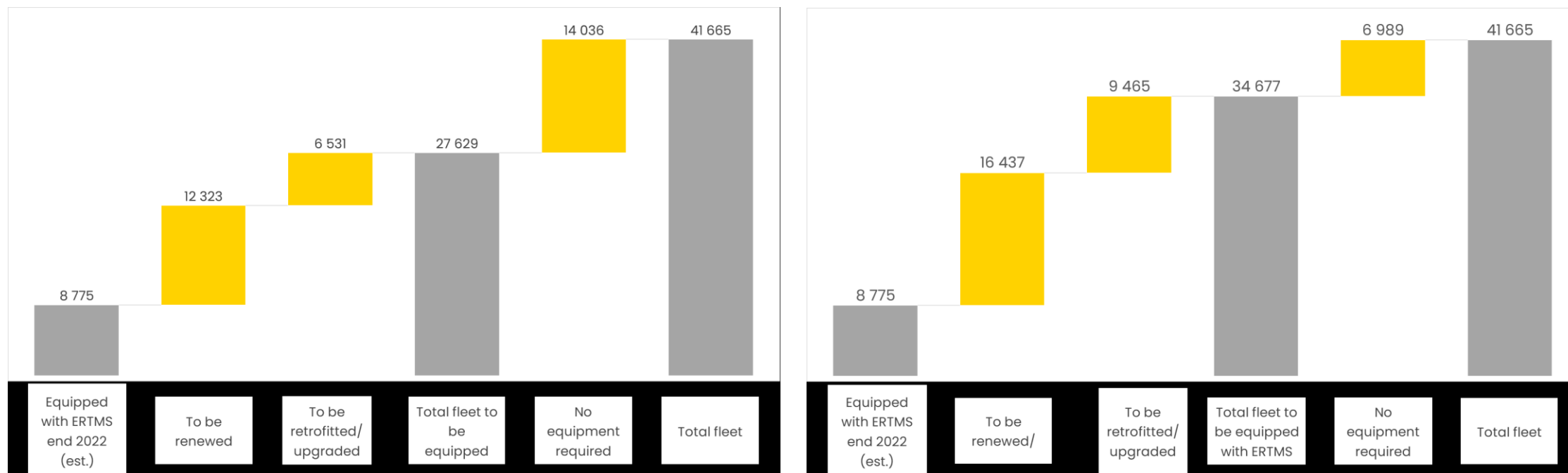
On-board deployment progress made in 2022

ETCS on-board deployment progress made in 2022

- **Some 900** vehicles were **authorised in 2022**.
- **Contracts** to equip some **1 500** vehicles with ETCS on-board system were **signed** between suppliers and vehicle owners in 2022.
- Some additional **600** vehicles to be equipped with ETCS in the following years were **announced in 2022**. These vehicles are not contracted with any supplier yet.



Total fleet to be equipped with ERTMS by 2030 – low and high bound



- Based on currently available data some **23 000** vehicles should be equipped with ERTMS by **2030** (**9 000** existing plus **14 000** already known to be renewed or retrofitted)

Opportunities

- There are very **large benefits** to be reaped by Infrastructure Managers by achieving a coordinated **ERTMS deployment by 2040** coupled with a **class B decommissioning**.
- **Class B** systems are becoming **obsolete across Europe**
- **More capacity** to be generated without additional tracks
- **Vehicles need to be equipped**, otherwise the benefits of trackside rollout will not be achieved
- **ERTMS** should now become **standard equipment** of the rolling stock.
- Change from isolated “**ERTMS islands**” to commercial significant **networks equipped with ERTMS**.
- Prioritisation of **ERTMS deployment on specific sections (missing links)** would enhance international freight operations.
- **Class B systems** will become **niche markets** and **maintenance costs will rise**.

Challenges

- **Rolling stock** (prototypes, scrapping schemes, smaller freight operators)
- **Funding/financing** (national, CEF2, RRF, ESIF, EIB, EDTAC)
- **State aid rules** (current and forthcoming ones)
- **Capacity and know-how** (suppliers, IMs, RUs, NSAs, ERA)
- Key role of **ERA and EU Rail** (deployment and evolution)
- **Coordination and compatibility** (synchronized deployment between trackside and onboard, between MSs – CB agreements, between different suppliers)
- **FRMCS migration**
- **Management of upgrades**
- New **NIPs** and revised **EDP**
- **ERTMS Forum** (national coordinators, “OSS” for all deployment related issues within the MSs and between the MSs)



Thank you for your attention!



@Transport_EU

Mobility and
Transport

CONNECTING
EUROPE