



Ministerstvo dopravy



SPRÁVA
ŽELEZNIC

ERTMS Implementation on the Czech Railway Network

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Rapid Implementation of ETCS is Necessary



Safety

Now there is **no ATP** that actually supervises the driver – speed, stop before the signal at danger

Capacity problem vs. train safety device situation of other states

Replacement of class B (only available on 25 % of the network, will not ensure the necessary safety)



Interoperability in Czechia and EU

Single system across the EU network → equipping vehicles with one on-board part that works everywhere, stable and robust system



Market opening

Emphasis on compatibility and common interface, delivery times, cost-effective solutions

Strategy of ERTMS Implementation in Czechia (I/III)

National Implementation Plan 2022 – 2040



**ETCS
L2**

High-Speed lines
New HSLs and Fast Connections lines

**ETCS
L2**

TEN-T lines
Backbone and very busy main lines

Class B decommissioning

**ETCS
L1 LS**

Secondary lines
Important and less busy lines

**ETCS
STOP**

Regional lines
with low traffic intensity

- L2 with lineside signals
- L2 with interlocking optimisation without signals – capacity reasons

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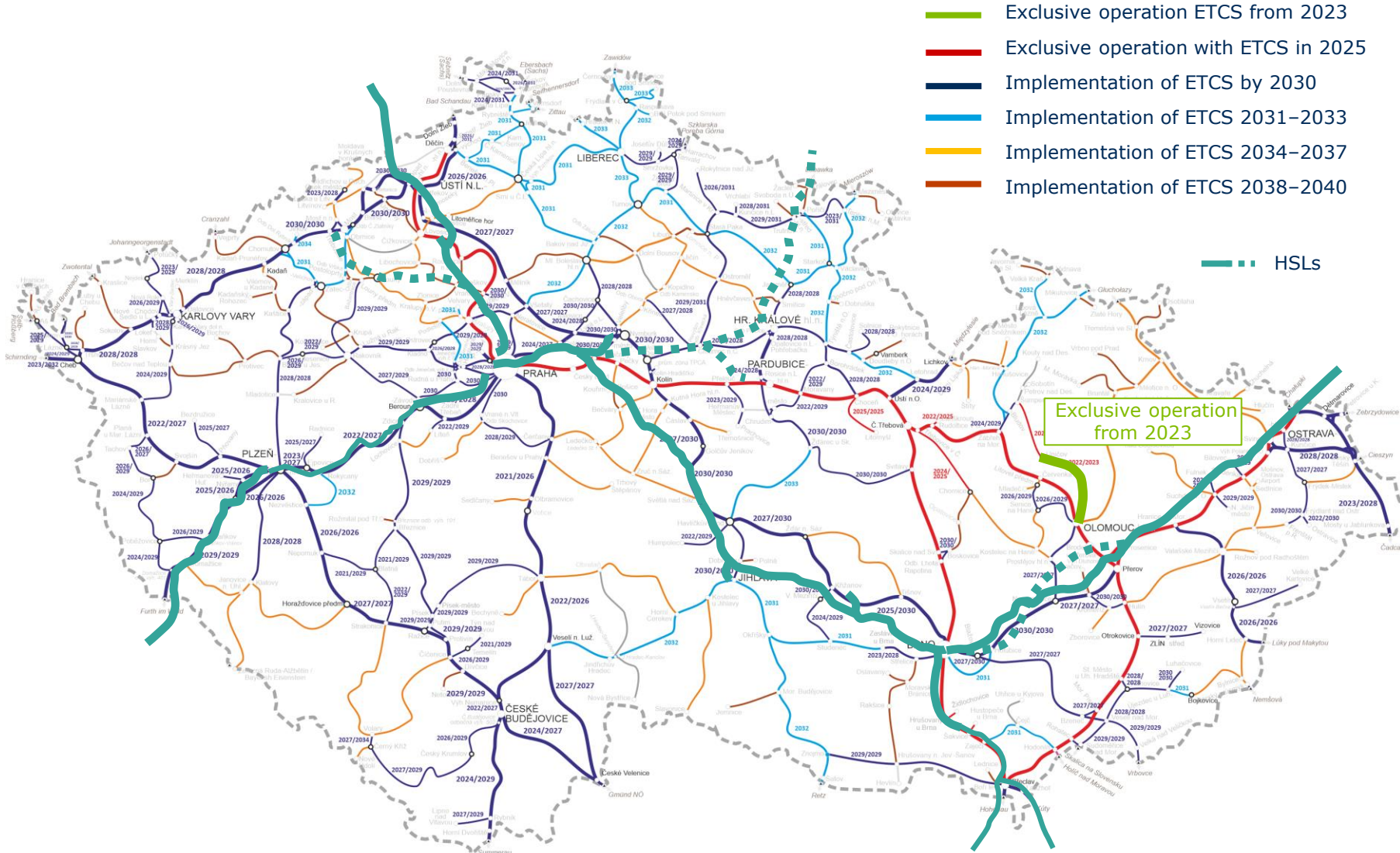
- Level 1 Limited Supervision

- LEU and controllable Eurobalises

ETCS is the only target ATP system for all the Czech railway network
(user friendly, sustainable, economically viable)

Strategy of ERTMS Implementation in Czechia (II/III)

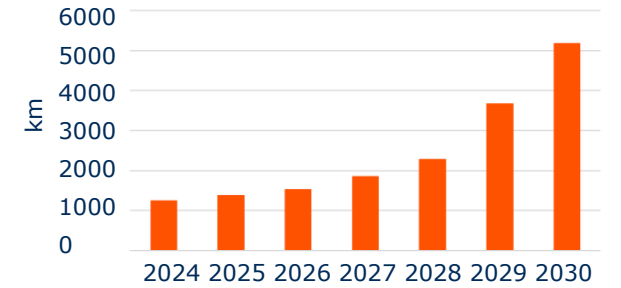
National Implementation Plan 2022 – 2040



- Exclusive operation ETCS from 2023
- Exclusive operation with ETCS in 2025
- Implementation of ETCS by 2030
- Implementation of ETCS 2031–2033
- Implementation of ETCS 2034–2037
- Implementation of ETCS 2038–2040

- - - HSLs

Length of lines equipped with ETCS by 2030

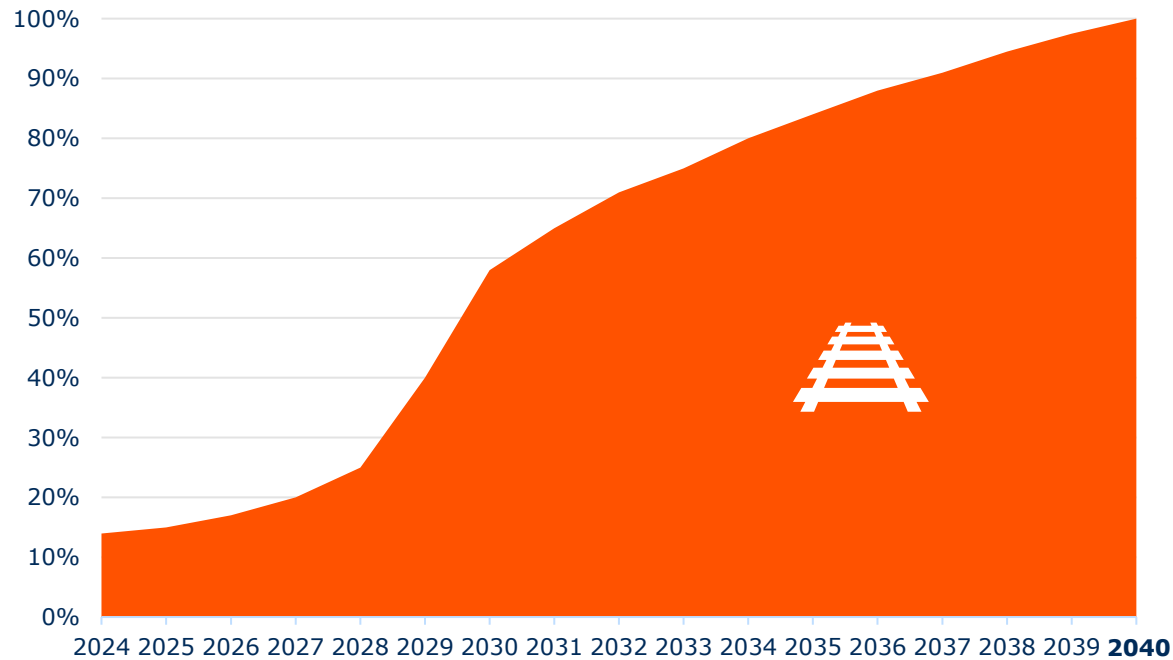


Strategy of ERTMS Implementation in Czechia (III/III)

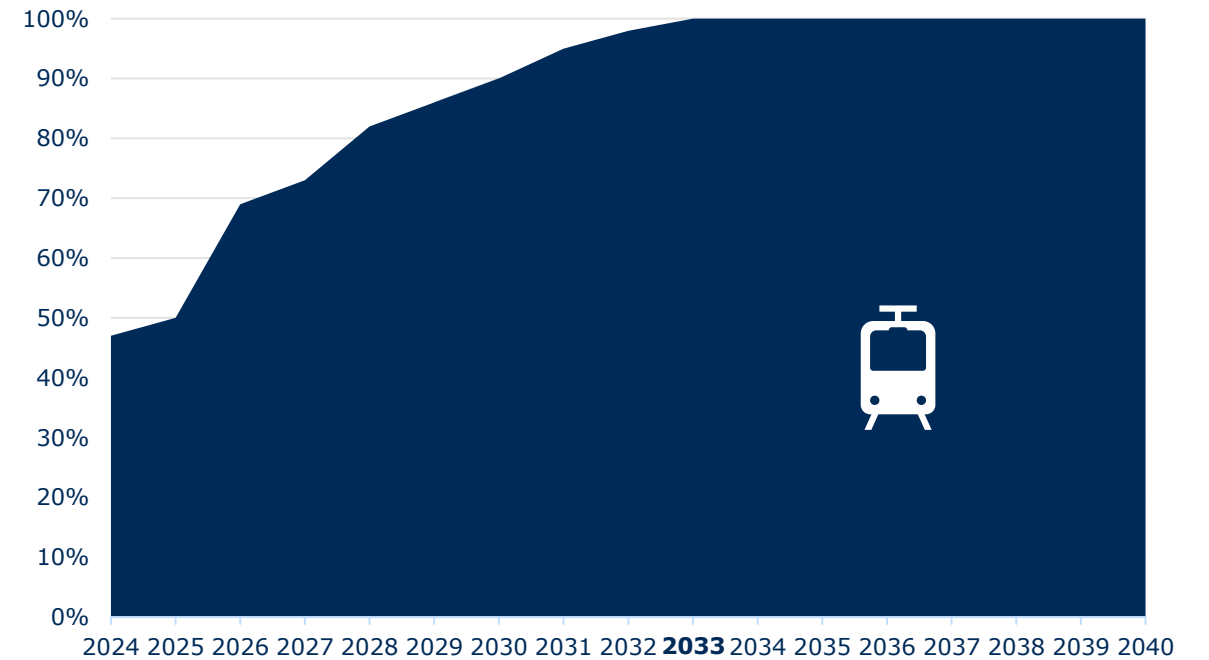
National Implementation Plan 2022 – 2040



Lines equipped with ETCS by 2040



Vehicles equipped with ETCS by 2040



The Reality in 2024



ETCS L2 Trackside operation

(rolling stock with BL 2 or higher)

- █ ETCS exclusive operation
- █ ETCS mixed operation
- █ ETCS mixed operation, with additional measures

Other

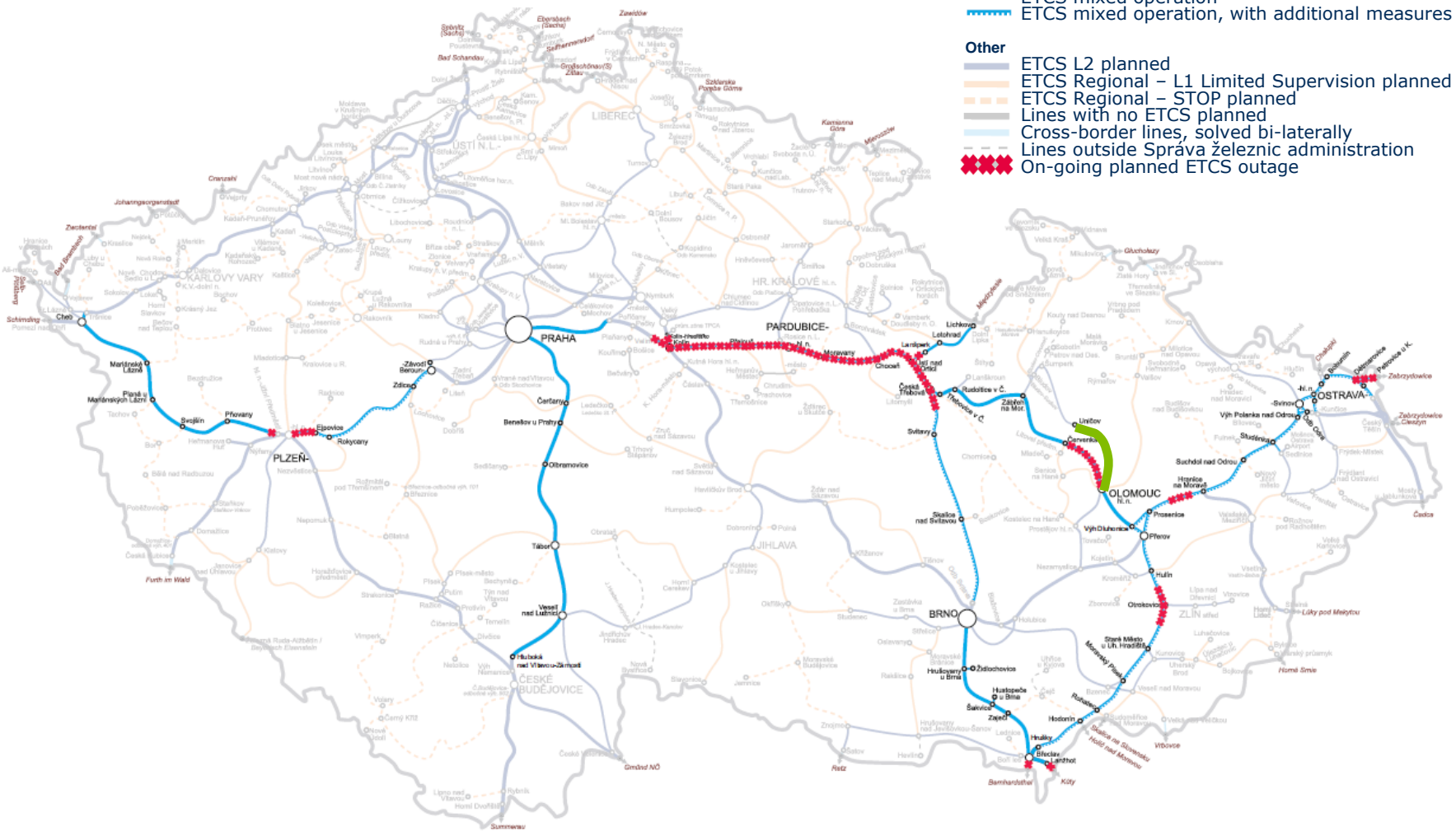
- █ ETCS L2 planned
- █ ETCS Regional – L1 Limited Supervision planned
- █ ETCS Regional – STOP planned
- █ Lines with no ETCS planned
- █ Cross-border lines, solved bi-laterally
- █ Lines outside Správa železnic administration
- █ On-going planned ETCS outage

29 km

of lines with exclusive operation ETCS

1 100 km

of lines equipped with ETCS



First year of exclusive ETCS operation (Olomouc – Uničov)



Initial frequent outages and emergency stops of trains → **non-communication** of stationary and on-board parts



Now **100% reliability** → on-board part modification

Solution for Secondary Lines LEU + Controllable Eurobalises



Rapid solution of ATP implementation necessary



Crucial targets and requirements for Czech regional lines



To **avoid accidents caused by human factor** (driver) → frontal collision of trains



Applicability of the digital and technical solution in a **very short time**



Solution **MUST be compatible with OBU ETCS**



Technically **simplified and economically favorable** solution



Simple interlocking, LEU and Eurobalises



Solution based on ETCS L1 (Limited Supervision)



ETCS STOP – detection of undesirable passing Signal at Danger emergency brake + maximum speed supervision – station/open line



ETCS L1 Limited Supervision – solution working with braking curves

The Czech Fleet Overview



More than **120 operators** in Czechia



High number of **different loco types** of small series
(lower tens of locos in a serie in best cases)

▶ The costs of prototypes are divided in small number of locos what results in very high costs for operators



Average age of the rolling stock is approximately **30 years**

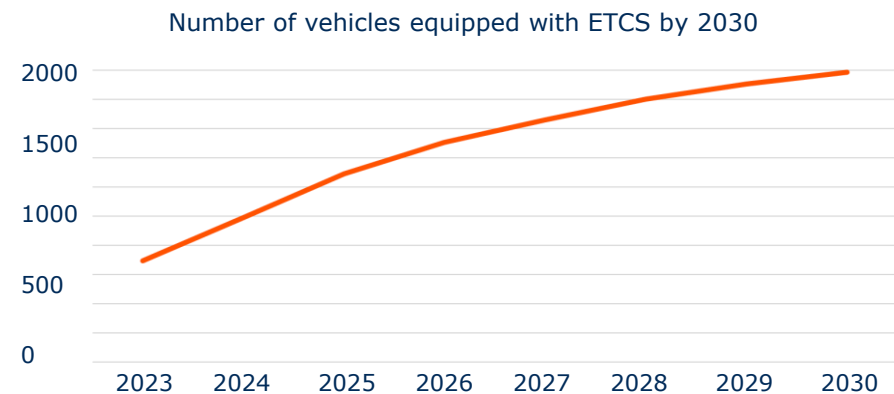


Vehicles to be retrofited

▶ **EV locos:** from 90s and newer

▶ **Diesel locos:** locos modernised after 2000

▶ **Units:** from 90s and newer





Subsidy schemes for railway undertakings

▶ **Retrofit** max. **337k €** per vehicle (**series**)

▶ **Retrofit** max. **932k €** per vehicle (**prototype**)



In case of projects supported in CEF 2: national cofinancing up to 337k € per vehicle

▶ **Fitment** max. **268k €** per vehicle



Subsidies 2017–2024 (total amount)

▶ **320 mil. €** (1 338 vehicles supported, including not yet approved applications from 2024)

▶ **ca 400 mil. €** (own investment of RUs)



Sources

CEF 1

CEF 2

Cohesion fund

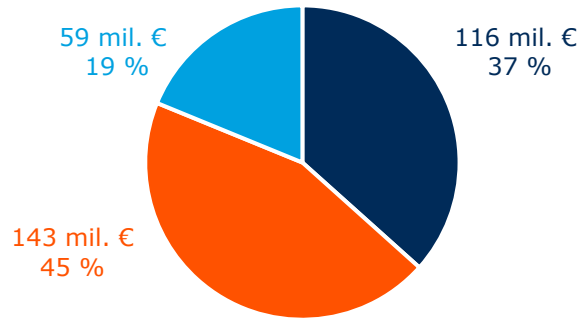
National financing

OBU ETCS State of Play

Including not yet Approved Subsidy Projects

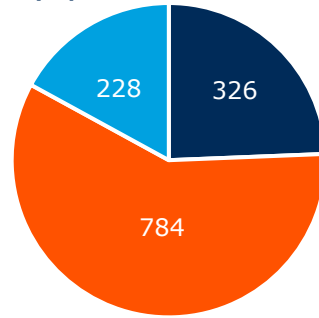


Sorted by public sources



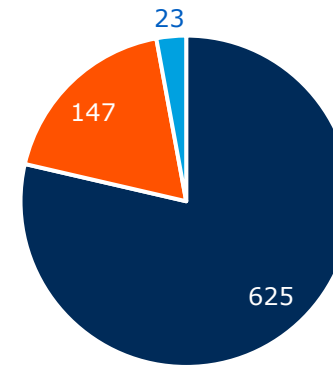
- Operation Programme Transport 2
- CEF
- National fund - SFDI

Sorted by no. of vehicles by public sources



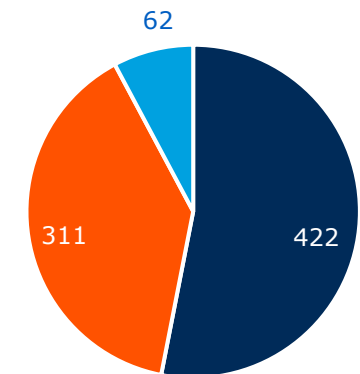
- Operation Programme Transport 2
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Sorted by projects type



- retrofit
- fitment (new vehicles)
- upgrade

Sorted by type of vehicles



- passenger
- freight
- maintenance



Approved **subsidy projects** must fulfil given **criteria**



Decision on what vehicles will be **retrofitted is fully on applicants**
 → In the event of a high number of applications, priority is given to newer vehicles



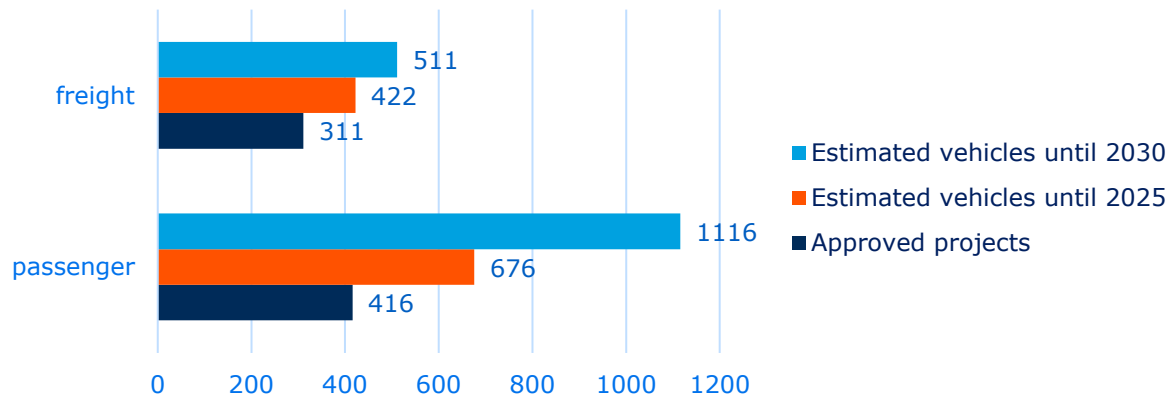
From the begging **MoT** offer possibility to **subsidy both of projects** – retrofit and fitment

OBU ETCS State of Play

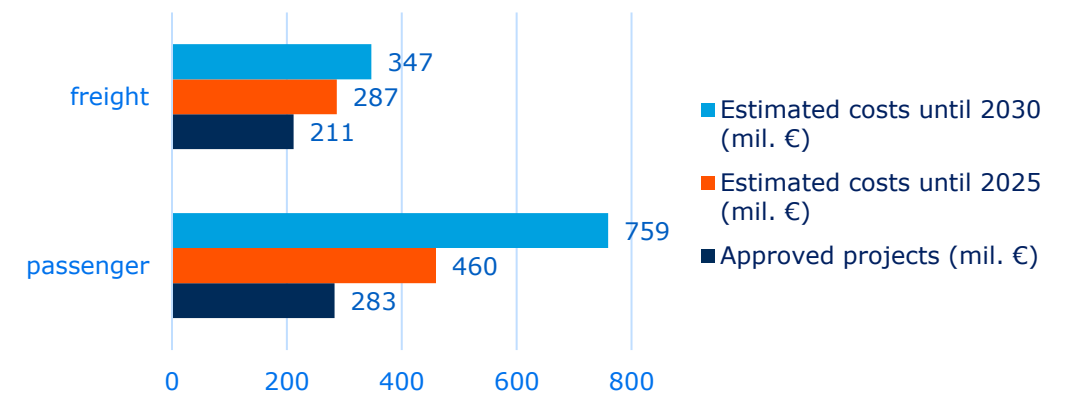
Estimated need for OBUs and overall costs



Total need for vehicles with OBU by 2025 and 2030



Overall estimated costs for vehicles (mil. €)



Vehicles already equipped Q1/2023

	Retrofit	New instalation
Freight	187	91
Passenger	80	80



Current Issues

▶ **Instability and frequent TSI changes**

▶ **interoperability** issues between ETCS versions and vehicles vs. infrastructure

▶ **There is no emphasis on protecting the investments** of RUs and IM

▶ **Uncentralised management of ERTMS on EU level**

▶ **No clear requirements for operation in emergency situations** → natural disasters, conflicts

▶ **The communication system (FRMCS)** must be developed soon and then remain stable

▶ No **cost efficient solution** for **non-TEN-T** lines

▶ Very costly and lengthy **approval process**



Draft Measures

- ▶ **Stability of financing**, including partial compensation for necessary upgrades
- ▶ Creation of a **strong programme manager** → e.g. strengthening the role of the EU coordinator
- ▶ Guarantee of at least 15 years of **BL4 stability**
- ▶ Methodology of **operation in emergency situations** → is not just about CCS - but role of the railway
- ▶ Enabling **ETCS light** → lines not on the TEN-T network, also based on satellite technology
- ▶ **Simplifying and smoothening ETCS** tracksite approval
- ▶ **ERA** shall become a real **authority for TSI development and ERTMS roll-out**



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Thank you for your kind attention

ERTMS Implementation on the Czech Railway Network

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