

CEF 2024

Intentions of Správa železnic for the development of ERTMS/ETCS

Tomáš Konopáč

General Directory

Manager for ETCS implementation coordination on the Czech railway infrastructure

Prague, 02 December 2024

Czech Railway Network

Total length of lines	9 459 km
Total length of electrified lines	3 210 km
Length of single-track lines	7 534 km
Length of double and multiple-track lines	1 925 km
Total length of tracks	15 493 km
Rail network density	122 m/km ²
Railway crossings	8 041
Interoperable parameters of transit corridors	
Gauge	1 435 mm
Structural gauge	UIC-GC
Loading gauge (Track carrying capacity)	UIC-D4
Contact line systems	AC/DC

- Current situation of ATP:
 - TEN-T lines (25 %): ATP Class B available, ETCS L2 gradually developing
 - Vast majority of lines (75 %) **without ATP**, only vigilance button and lineside signals

Key Points for Správa železnic



Safety

- ▶ Strong need of ATP that actually supervises the driver – speed, stop before the signal at danger
- ▶ Replacement of class B (only available on 25 % of the network, not ensure the necessary safety)
- ▶ Safety, but capacity problem (situation in CZ vs. other states)



Interoperability in Czechia and EU

- ▶ **Single system across the EU network** → equipping vehicles with one on-board that works everywhere, ERTMS MUST BE stable and robust system



Open Interface, cost-effective system

- ▶ Need of compatible and open interlocking interface – delivery times, capacities, cost-effective solutions

ETCS in Czechia – Timeline

2005	ETCS pilot project in Czechia (Velim – Poříčany, 22 km)
2011	Evaluation of ETCS test operation and verification of its implementation in national conditions
2018	Completion of the first section of ETCS L2 on the 1 st transit corridor (Kolín – Česká Třebová – Brno – Břeclav – AT/SK, 252 km)
2020	The NIB recommendation – to implement ETCS on the whole network
2020	First conceptual document – basic technical strategy and schedule for ETCS implementation 2022 – 2040
2021	Government resolution – Plan for safety increase on the Czech railway
2022/23	Správa železnic is a member EUG and EULYNX – Full market opening to competition
2023	The first line with ETCS exclusive operation – Olomouc – Uničov (25 km)
2025	Start of ETCS exclusive operation on the main corridors (620 km)

Technical Pillars of Implementation: One OBU for All

Strategy of ERTMS Implementation in Czechia: 2020 – 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

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

- 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)

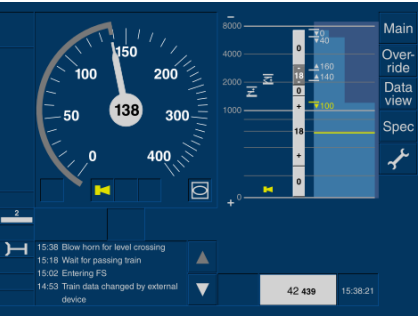
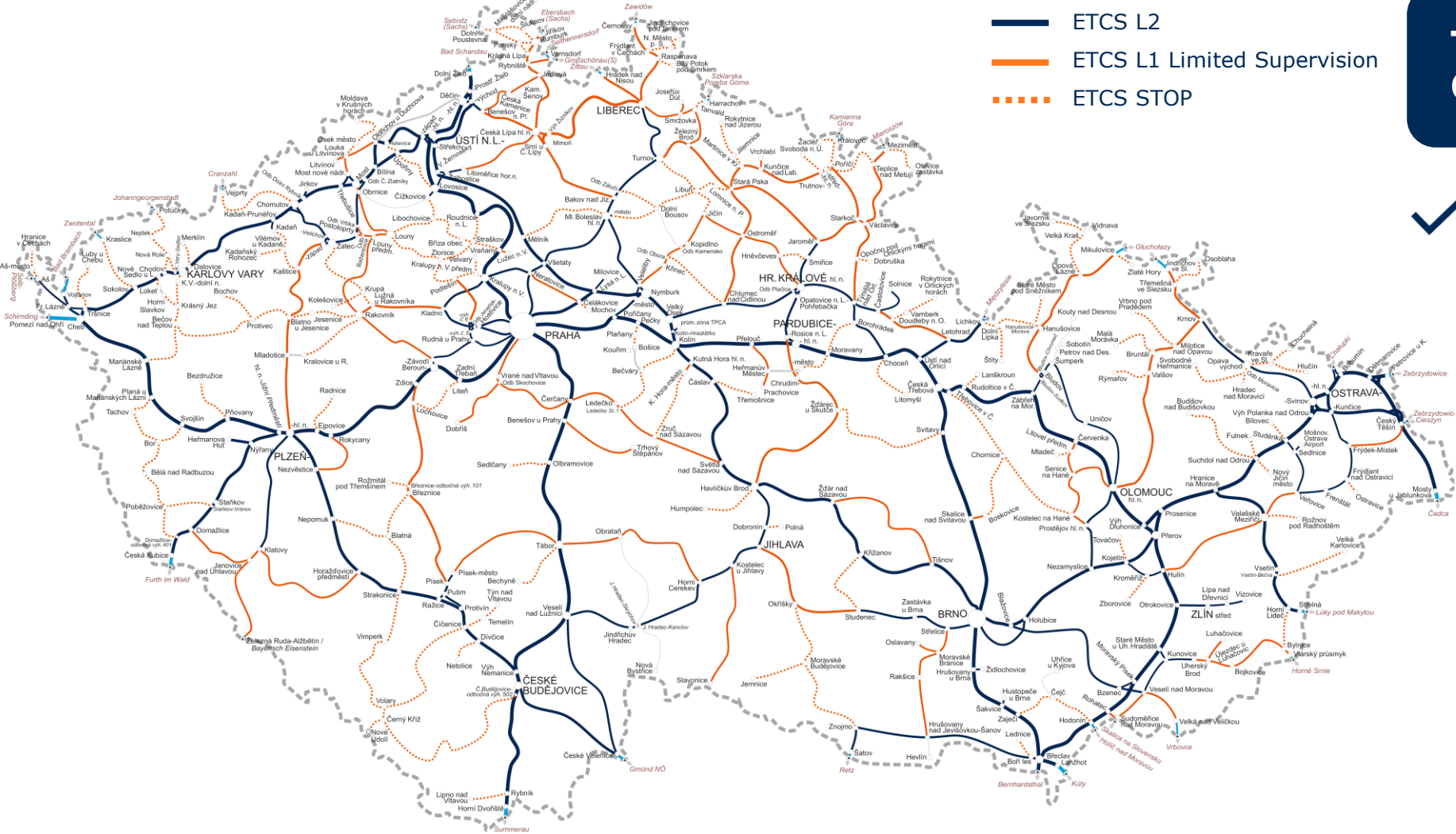
Technical strategy of ETCS Implementation in Czechia

2020 – 2040

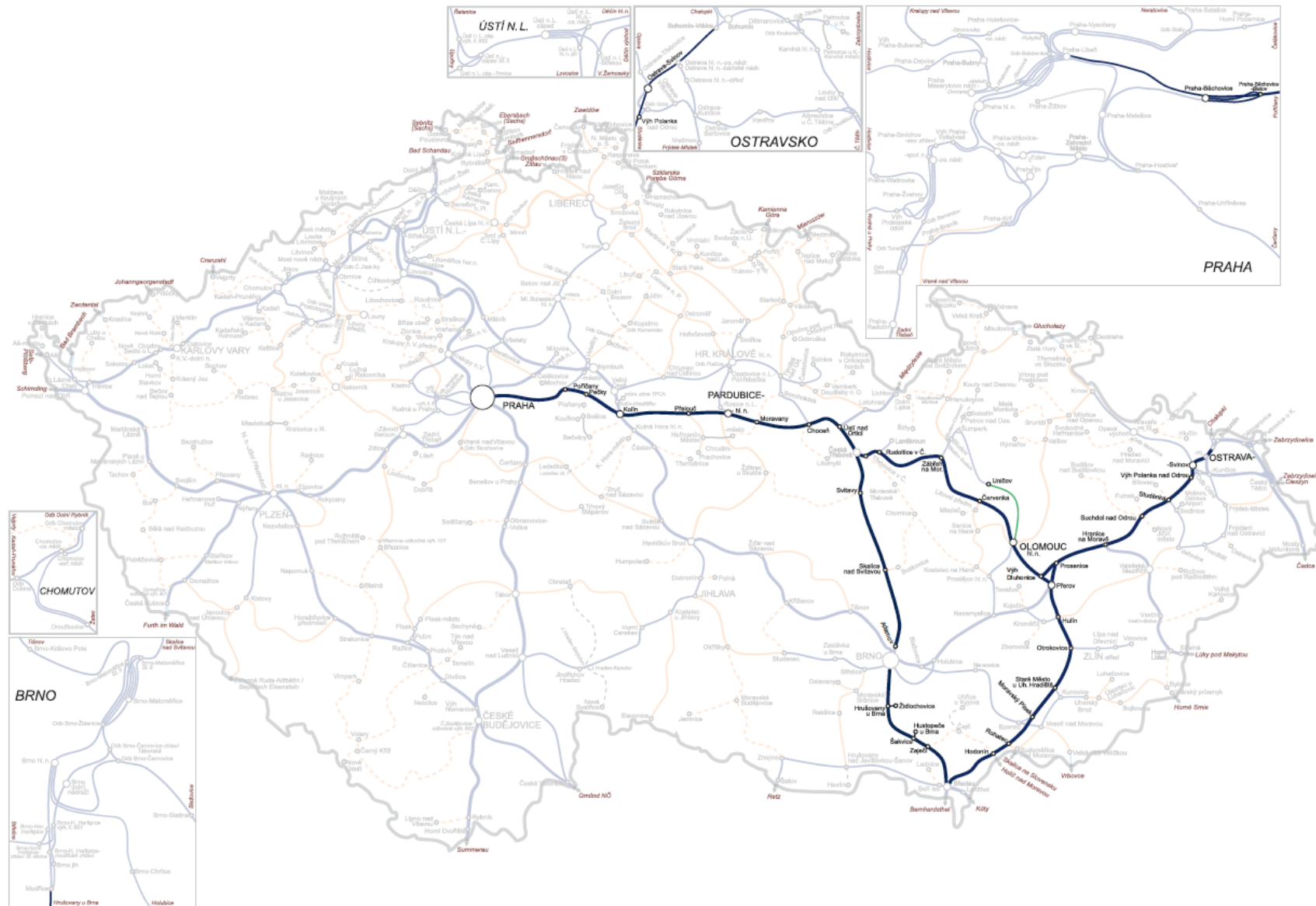
- ETCS L2
- ETCS L1 Limited Supervision
- ETCS STOP

The Government of Czechia and MoT

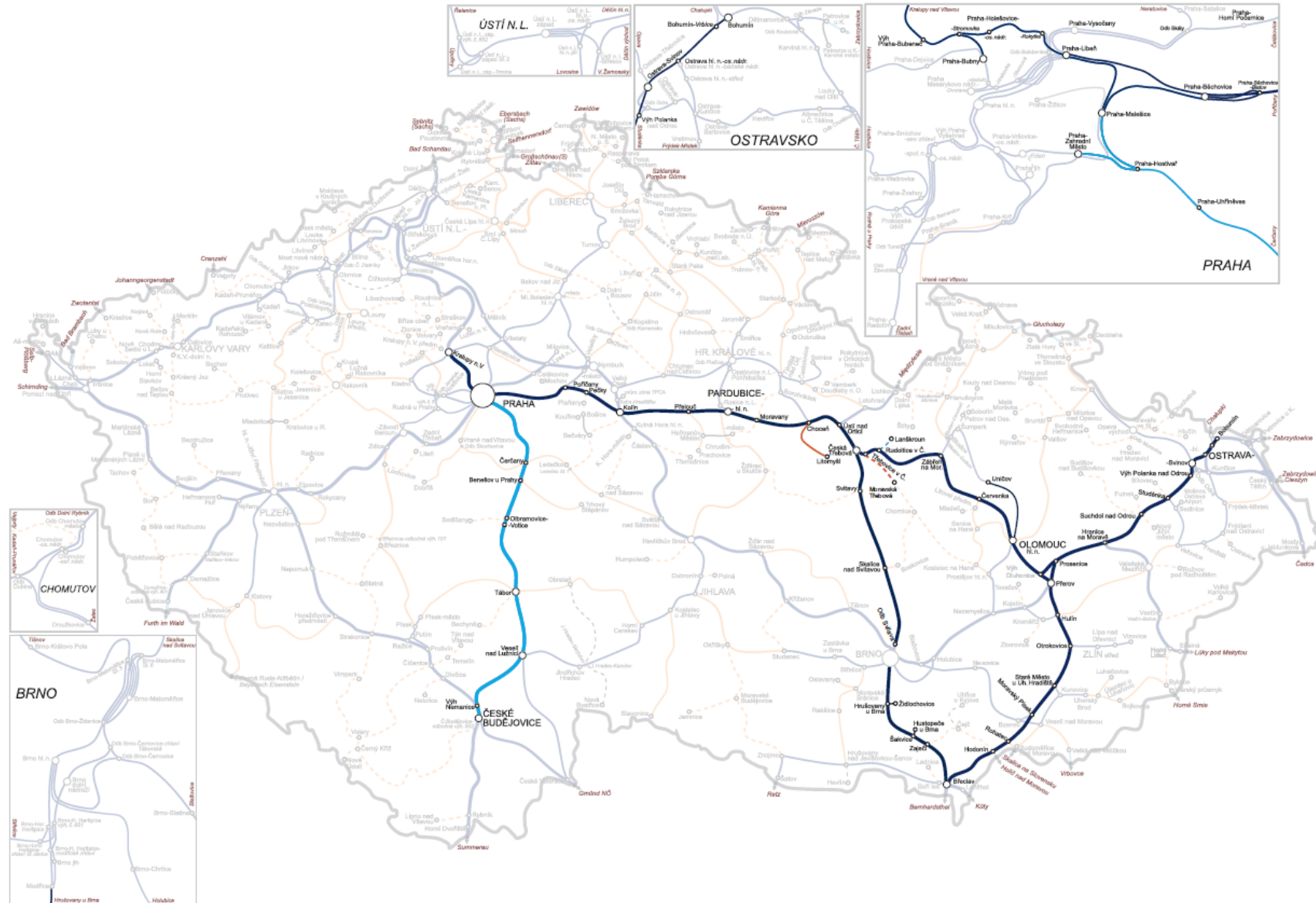
✓ approved the ETCS plan and technical variants for all lines in Czechia



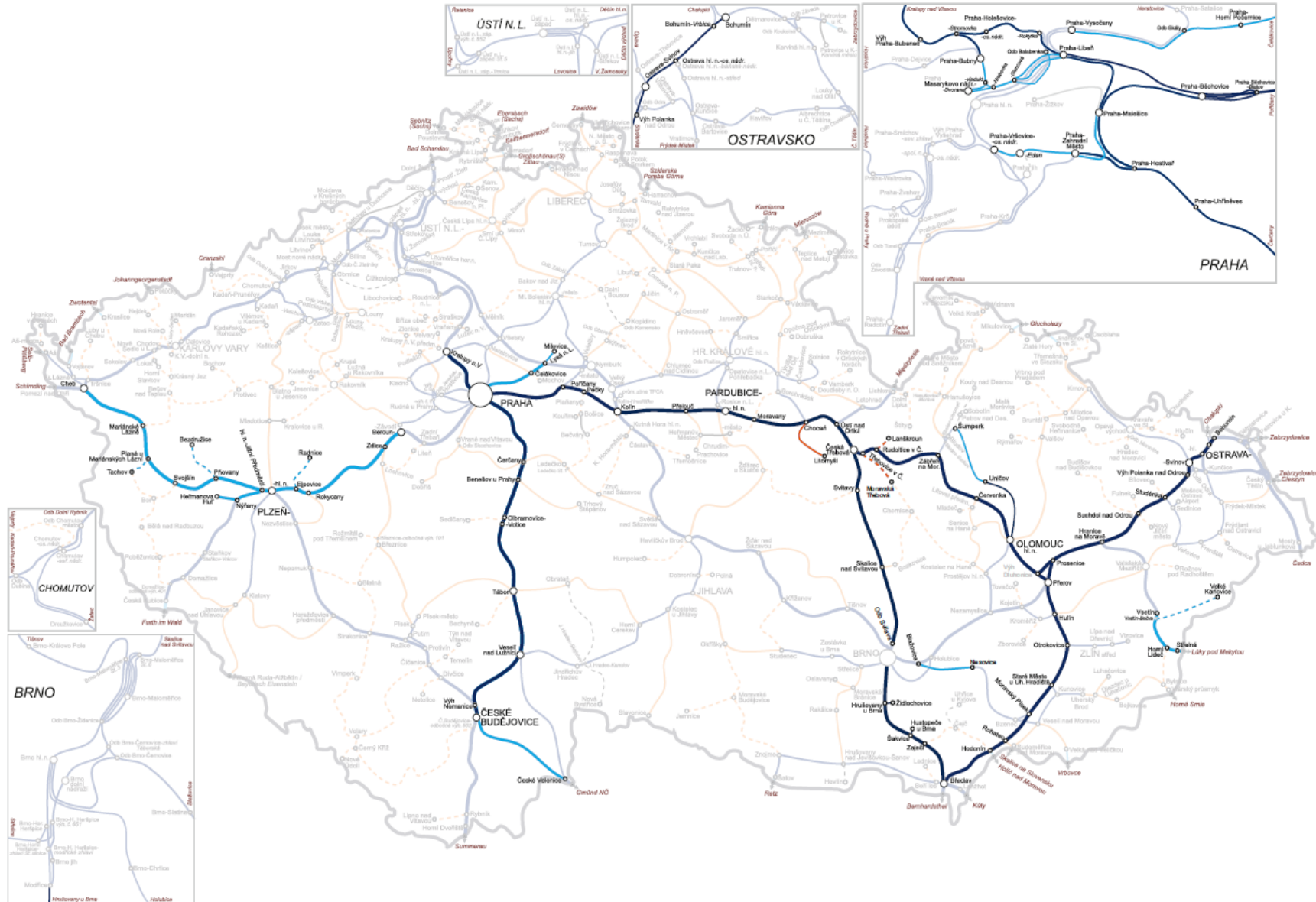
ETCS Exclusive Operation from 2025



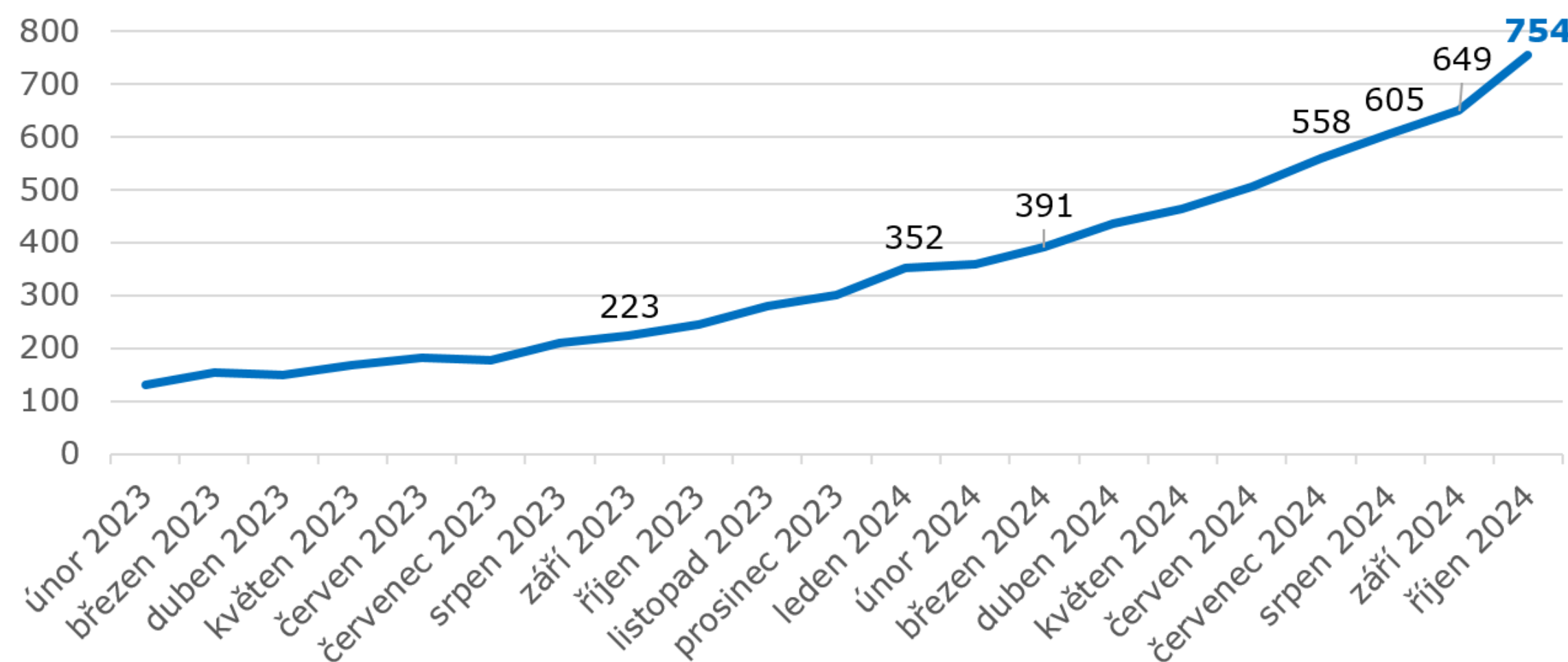
ETCS Exclusive Operation from 2026



ETCS Exclusive Operation from 2027



The Number of Unique ETCS OBUs on the Czech Railway Network



Solution for TEN-T lines: ETCS Only Operation + interlocking optimisation

- **Mixed operation** of vehicles with OBU ETCS and non-ETCS vehicles:

Line Capacity limited

Possible safety risk

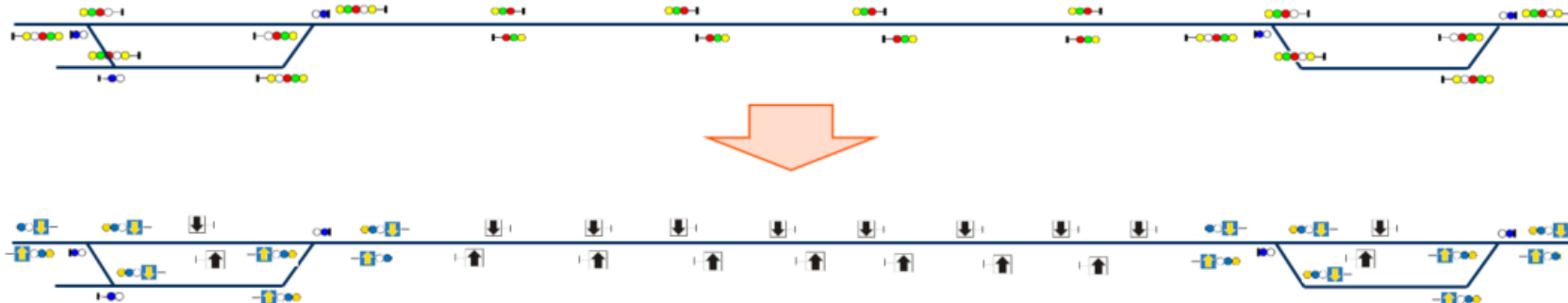
Double CCS maintenance

Not real benefits for RUs using ETCS

ERTMS benefits are not gained

Max. speed 160 km/h is a limit

- **The only way, how to eliminate these negatives, is to ensure ETCS-only operation with conventional interlocking optimization** (incl. Class B decommissioning)
- **All vehicles** on the line shall be equipped **with OBU ETCS**



Solution for Secondary Lines based on ETCS L1



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

Resume – What Do We Expect from CCS TSI Application

- ✓ **Rapid safety increase by ATP application in Czechia needed**
- ✓ **ERTMS/ETCS (L1, L2) is a target, class B shall not be installed any more**
- ✓ Necessary conditions – National level 
 - **Strengthening of market capacities** (suppliers, designers...) compared to the current state
 - **ETCS exclusive operation** - all vehicles equipped with OBU ETCS
 - **Technically and economically suitable solution** also for secondary lines (ETCS L1 LS)
 - How to **open interface between interlocking products incl. ERTMS?**
- ✓ Necessary conditions – European level 
 - **Stability needed** – TSI shall be **stable and shall ensure backwards compatibility** solution
 - **Minimum changes** of an **existing** OBU ETCS (frequency of upgrades 10 - 15 years)
 - **Competition** among ETCS suppliers (trackside as onboard) shall **increase**
 - **Level 1 shall remain** in the CCS TSI also for future – crucial for making last mile interoperable



Thank you for your kind attention

**Intentions of Správa železnic
for the development of ERTMS/ETCS**

Tomáš Konopáč

konopac@spravazeleznic.cz