

16TH INTERNATIONAL CONFERENCE

UNDERGROUND CONSTRUCTION PRAGUE 2026

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Technical & Operational Concept of High-Speed Lines in the Czech Republic

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High-Speed Lines Construction Management
Správa železnic, státní organizace





SPRÁVA
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Vysokorychlostní trať spojuje

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26 May 2026



European Framework – EU TEN-T

Regulation (EU) 2024/1679 – TEN-T policy

Core / Extended Core / Comprehensive Network

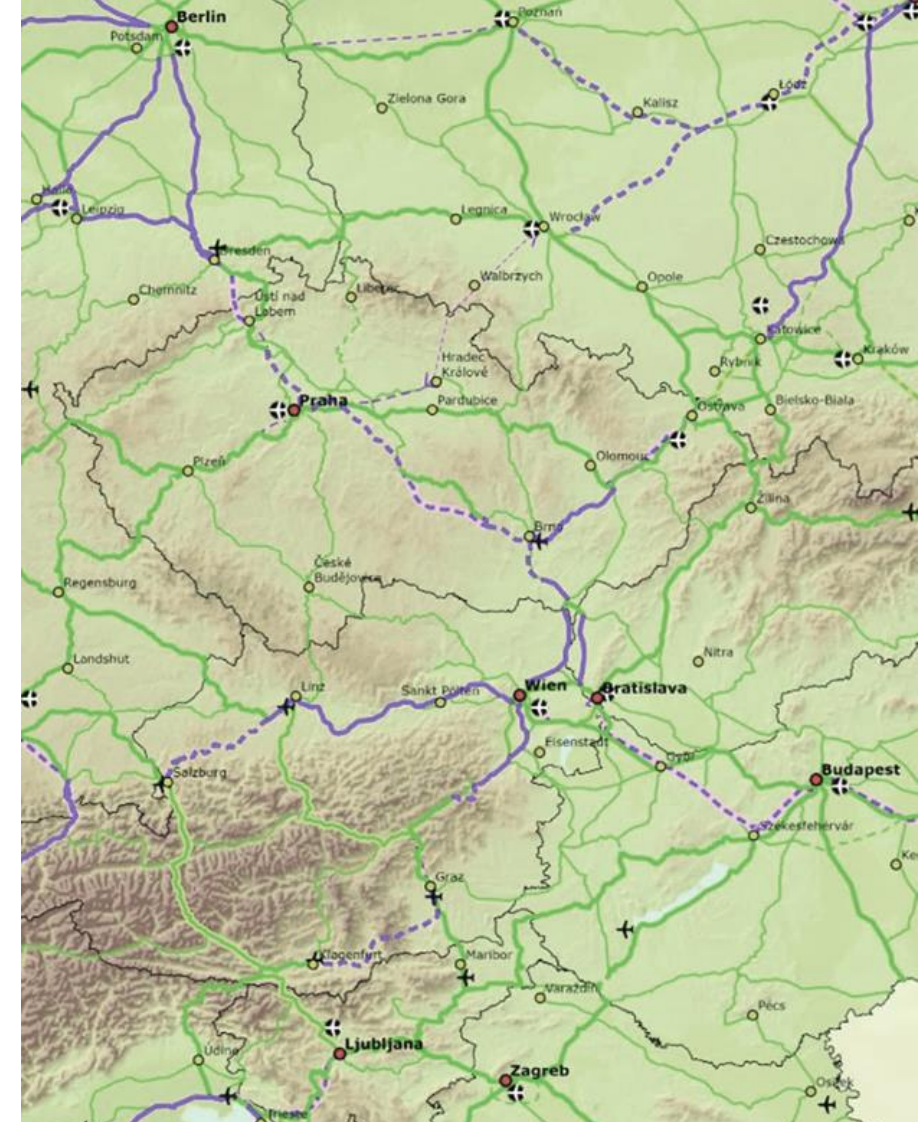
Czech HSL backbone is part of the TEN-T Core and Extended Core Network → eligible for EU co-financing

EU Funding & Policy

- **New EU transport package (11/2025) to accelerate HSR deployment**
- **CEF III (2028–2034, up to €51bn)** prioritises HSR cross-border projects
- **National and Regional Partnership Plans** (CZ share up to €27bn)

Key evaluation criterion:

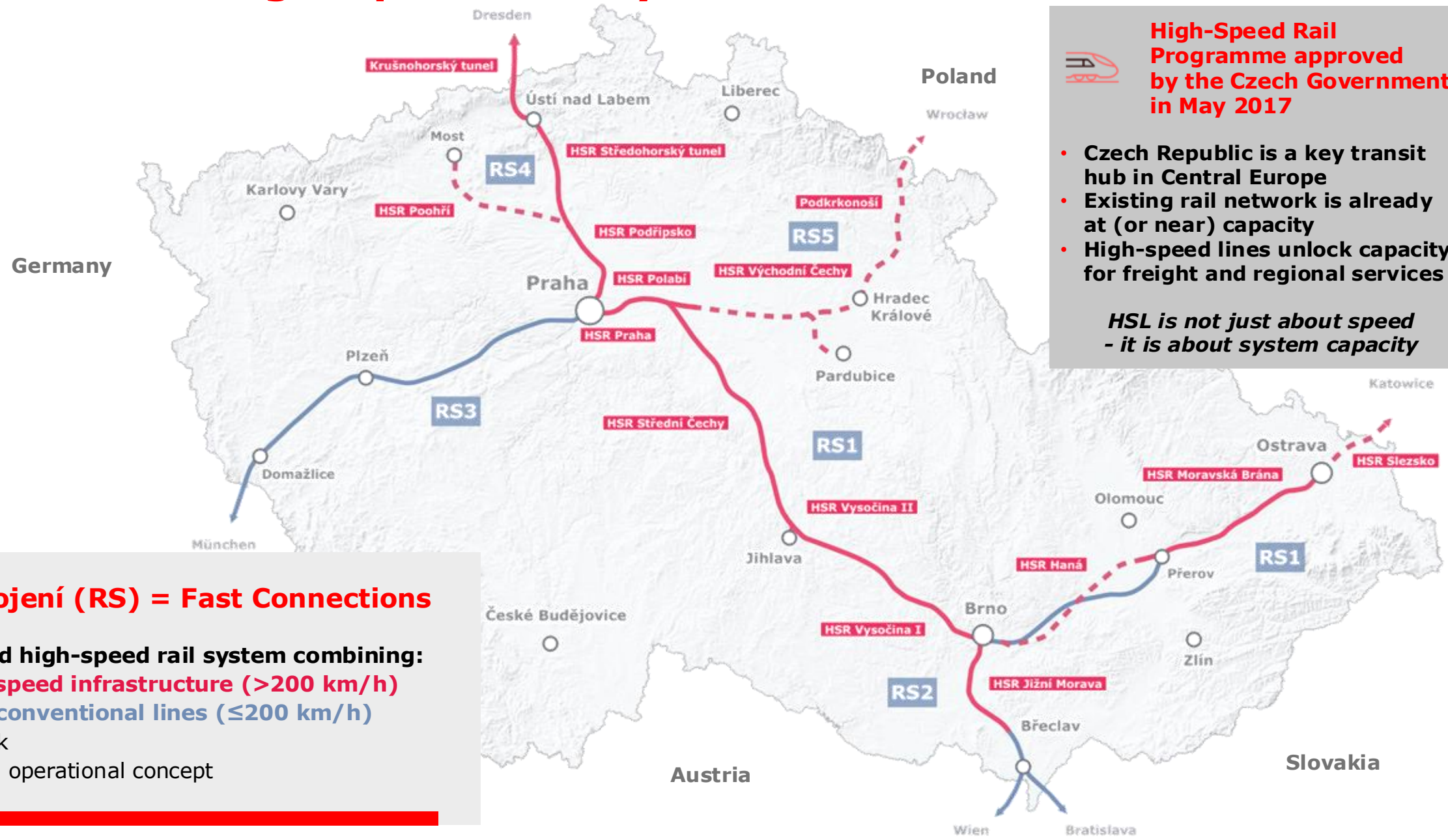
→ **Project maturity** (land acquisition, permits, surveys etc.)



- **Czech HSL connects major TEN-T corridors**
- **Strengthens cross-border links (DE, AT, PL, SK)**
- **Enables seamless high-speed travel across Central Europe**

Without Czech HSL, the European network remains incomplete

Future Czech High-Speed Rail System



High-Speed Rail Programme approved by the Czech Government in May 2017

- Czech Republic is a key transit hub in Central Europe
- Existing rail network is already at (or near) capacity
- High-speed lines unlock capacity for freight and regional services

HSL is not just about speed - it is about system capacity

Rychlá spojení (RS) = Fast Connections

An integrated high-speed rail system combining:

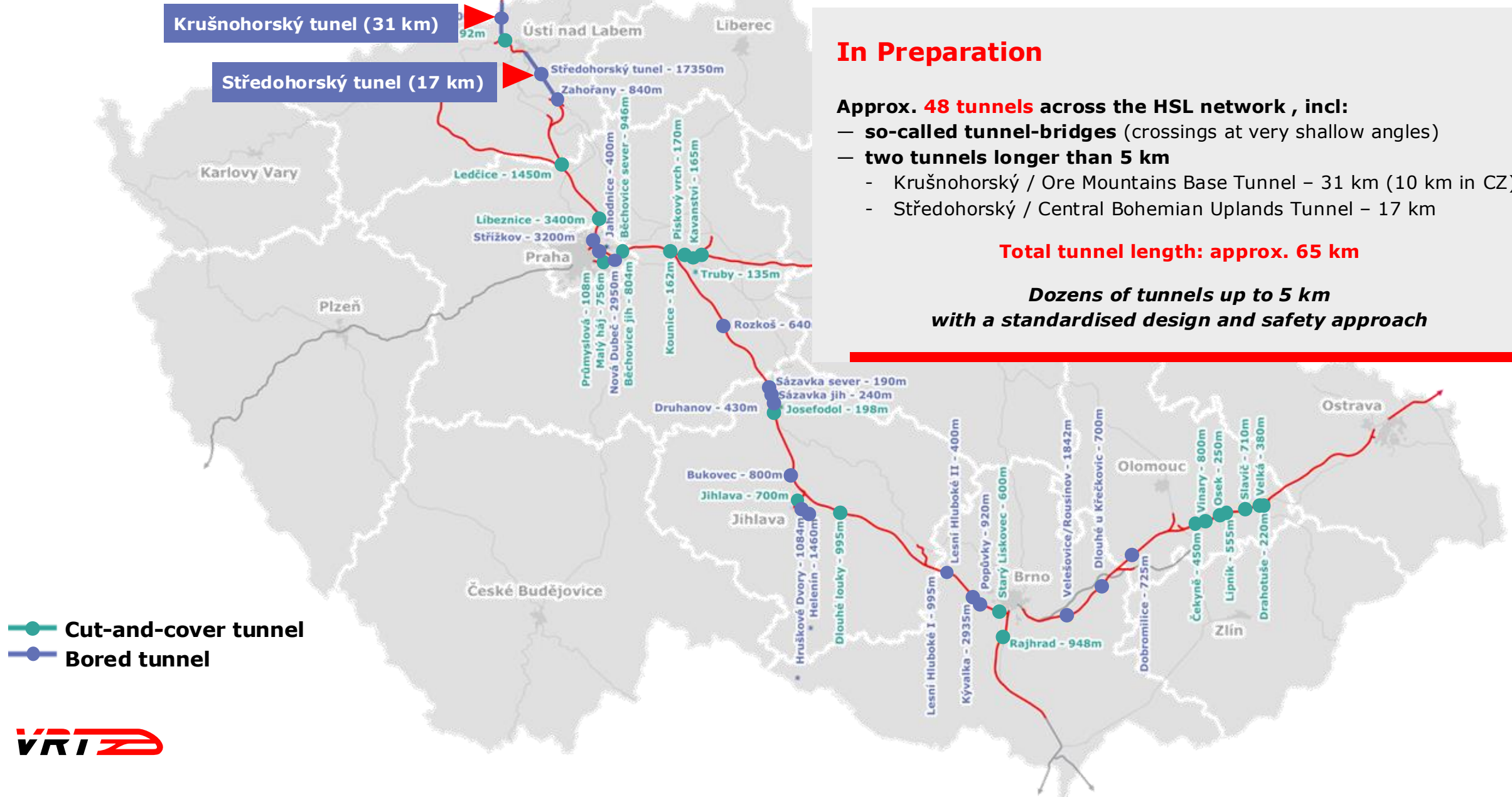
» new high-speed infrastructure (>200 km/h)

» upgraded conventional lines (≤200 km/h)

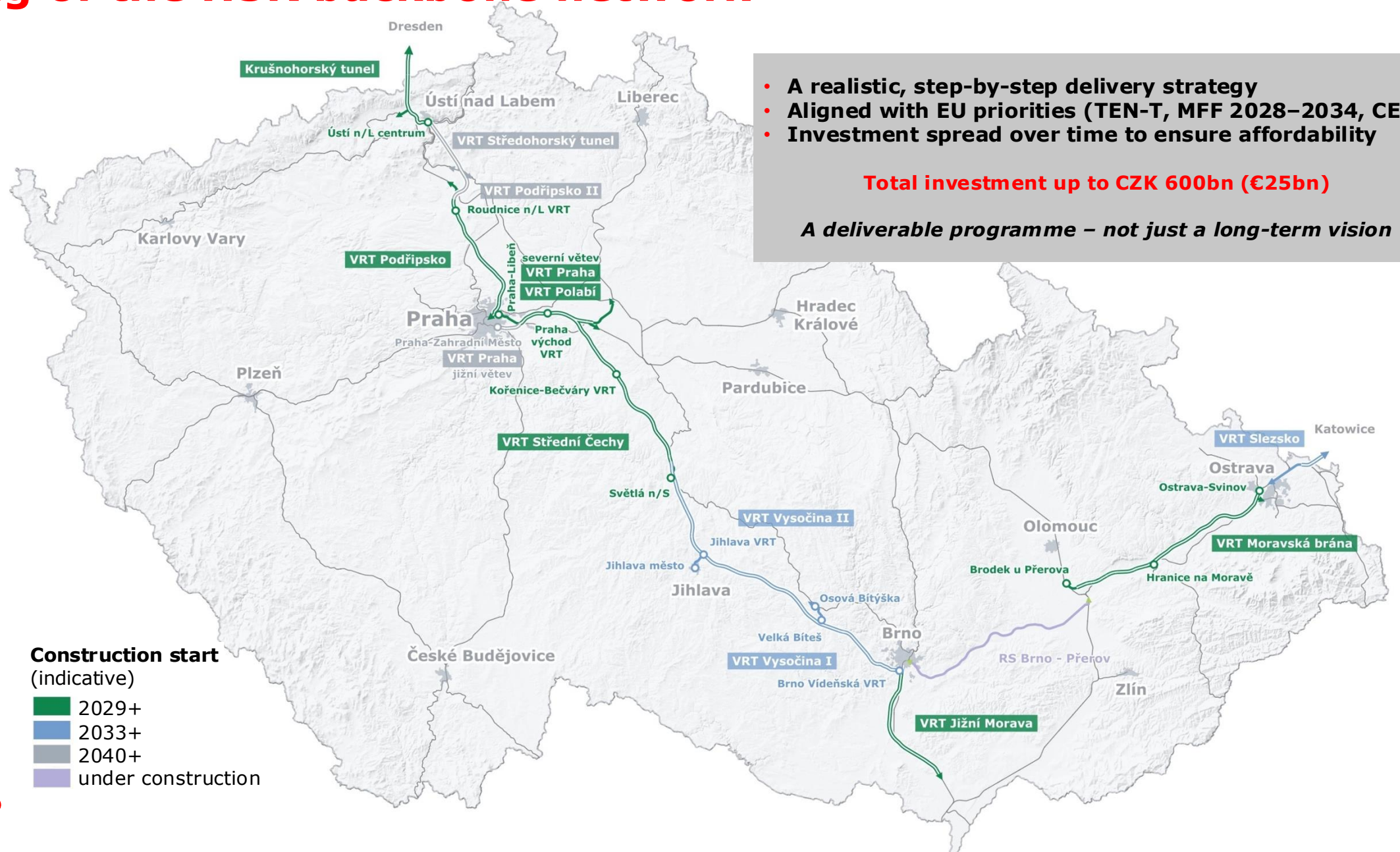
+ rolling stock

+ service and operational concept

New tunnels on HSR backbone network



Phasing of the HSR backbone network



- A realistic, step-by-step delivery strategy
- Aligned with EU priorities (TEN-T, MFF 2028–2034, CEF)
- Investment spread over time to ensure affordability

Total investment up to CZK 600bn (€25bn)

A deliverable programme – not just a long-term vision

From Preparation to Delivery

Feasibility studies completed for all HSL corridors and **positive Cost-Benefit Analysis (CBA)** confirms economic viability.

Key benefits:

- **Release of capacity on the conventional network** (freight & regional transport)
- **Significant reduction in travel times**

Project status:

- **Territorial protection secured on most sections**
- **Over 400 km in detailed design phase**
- **Extensive site investigations ongoing** (geodesy, geotechnics, archaeology etc.)

Key milestones:

- **Moravian Gate HSL & South Moravia HSL – positive EIA**
- **Land acquisition and archeological survey launched**
- **Ostrava-Svinov station modernisation – permit granted**

PPP preparation:

- **Moravian Gate HSL = first HSR PPP project**
- **Advisory team (WB/IFC) in place, tender preparation ongoing**

Funding:

- **Total preparation costs (until 2025): CZK 4.4bn (€180mil.)**
- **CEF funding (2025): ~CZK 500mil. (€20.4mil.)**

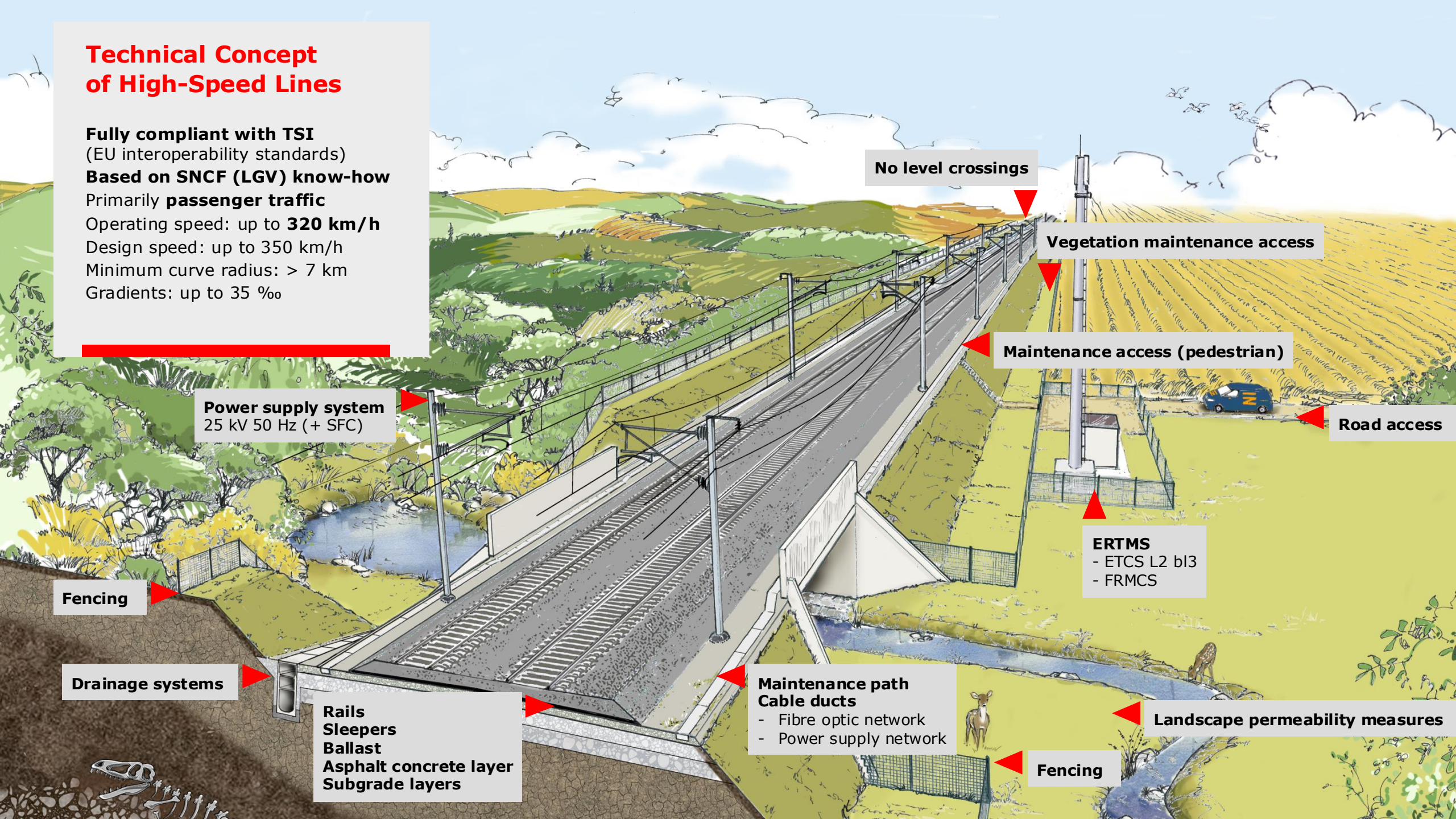
International cooperation:

- **CZ–DE treaty for Krušnohorský Tunnel preparation, construction and operation under preparation**



Technical Concept of High-Speed Lines

Fully compliant with TSI
(EU interoperability standards)
Based on SNCF (LGV) know-how
Primarily **passenger traffic**
Operating speed: up to **320 km/h**
Design speed: up to 350 km/h
Minimum curve radius: > 7 km
Gradients: up to 35 ‰



No level crossings

Vegetation maintenance access

Maintenance access (pedestrian)

Road access

Power supply system
25 kV 50 Hz (+ SFC)

ERTMS
- ETCS L2 b13
- FRMCS

Fencing

Drainage systems

Rails
Sleepers
Ballast
Asphalt concrete layer
Subgrade layers

Maintenance path
Cable ducts
- Fibre optic network
- Power supply network

Landscape permeability measures

Fencing

Fire Safety Principles for High-Speed Lines

Methodology (based on TSI and Czech Fire Rescue Service requirements) defining infrastructure and operational measures to ensure:

- Self-rescue of passengers and staff
- Effective intervention of emergency services

Scope of the methodology:

- Entire HSL network as a system
- Tunnels up to 5 km

Key assumptions:

- Passenger rolling stock = **Fire Category B** (TSI LOC&PAS)
- Operational control via HSL TMS and **ERTMS / ETCS Level 2**
→ **full control over train** stopping and non-stopping scenarios in predefined areas (in emergency situations)

Safety infrastructure for HSL system:

- **Evacuation & rescue points every ≤ 20 km**
- Combined evacuation + emergency access areas



Ore Mountains Base Tunnel (CZ–DE) Krušnohorský tunel

- **Joint project of Správa železnic and DB InfraGO**
- **Length: approximately 31 km (10 km in CZ)**
- **Mixed traffic (passenger + freight)**
- **Capacity for up to 150 freight trains per day**

Project status

- **Included in German Federal Transport Plan** (urgent need)
- **EIA screening completed** (CZ Ministry of Environment)
- **Bilateral treaty under approval**

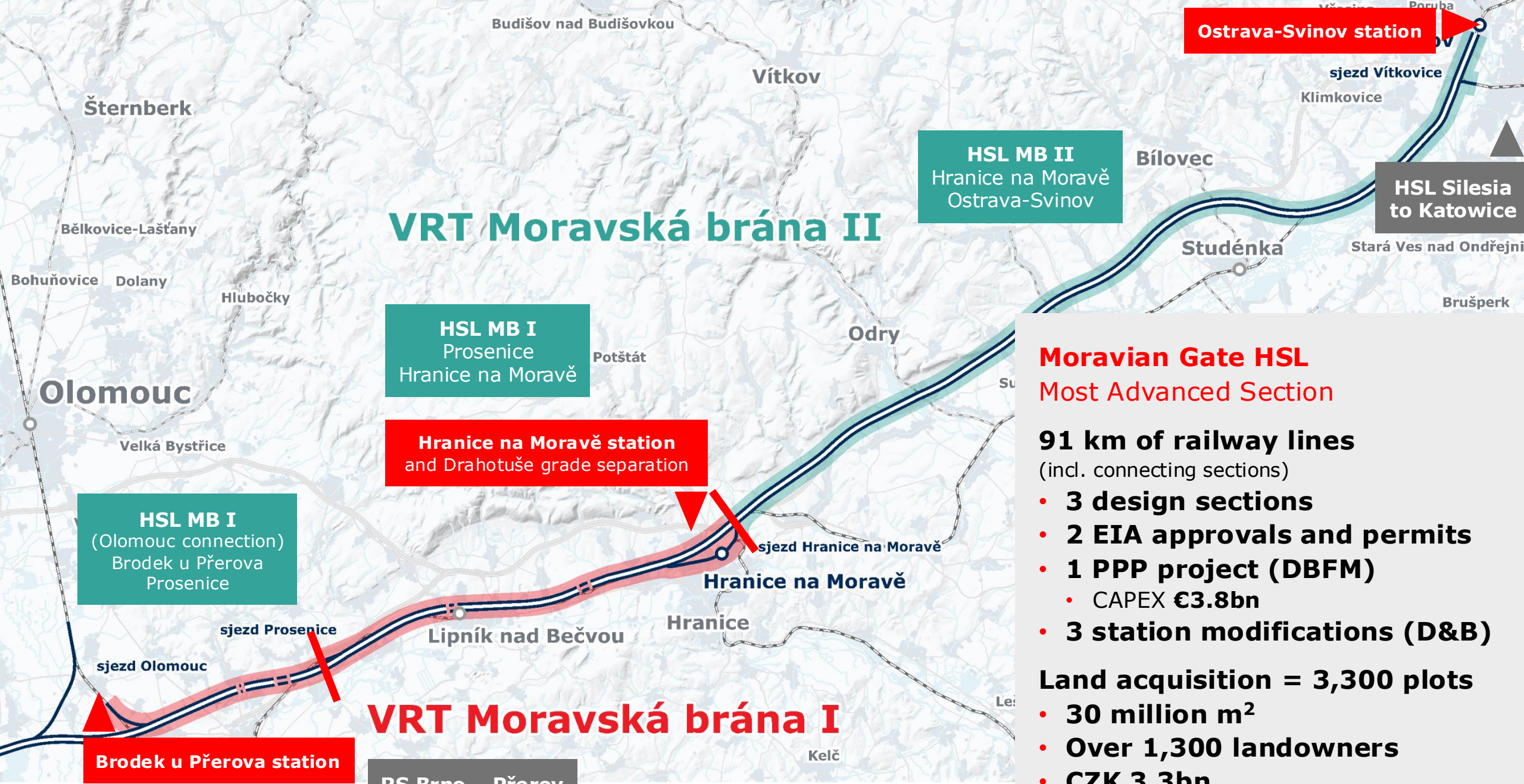
Surveys

- **157 boreholes completed**
- **Maximum depth: 546 m**
- **One of the most extensive geological surveys in the region**

Construction timeline

- **Expected: 2032–2042**





VRT Moravská brána II

HSL MB I
Prosenice
Hranice na Moravě

Hranice na Moravě station
and Drahotuše grade separation

HSL MB II
Hranice na Moravě
Ostrava-Svinov

Ostrava-Svinov station

HSL Silesia
to Katowice

HSL MB I
(Olomouc connection)
Brodek u Přerova
Prosenice

Brodek u Přerova station

VRT Moravská brána I

RS Brno – Přerov

Moravian Gate HSL
Most Advanced Section

91 km of railway lines
(incl. connecting sections)

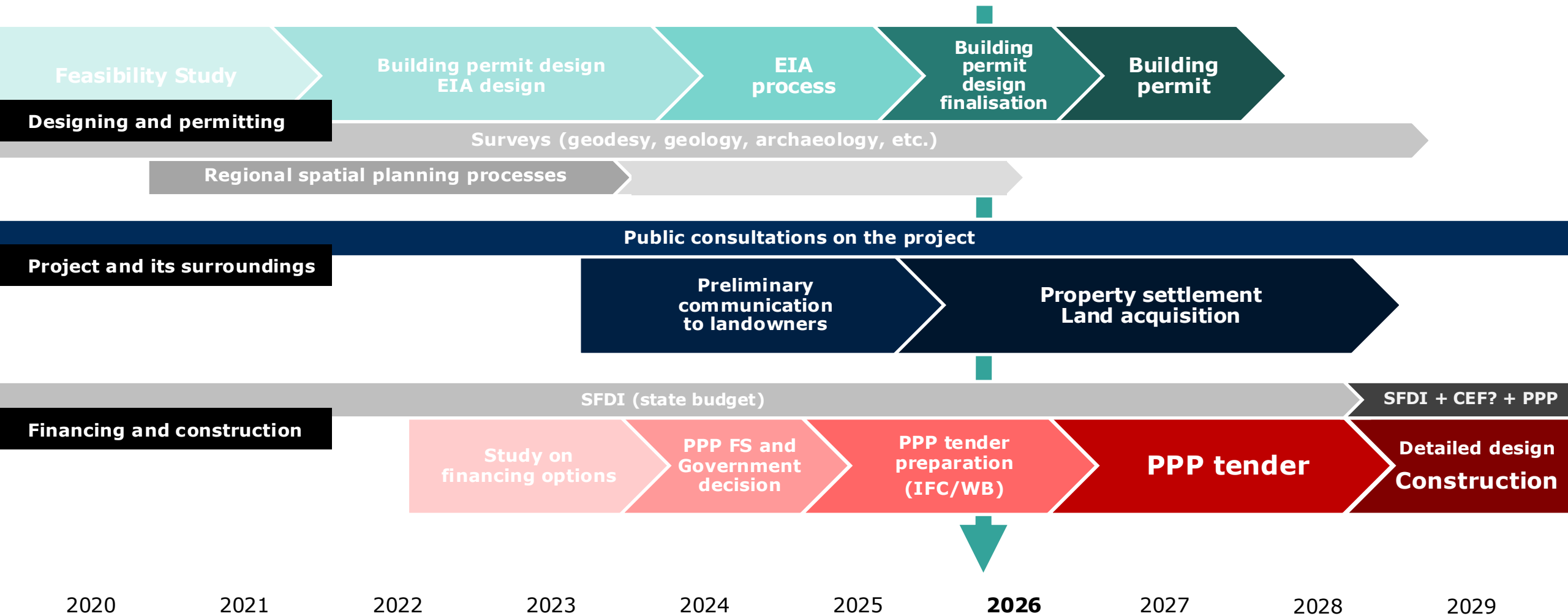
- **3 design sections**
- **2 EIA approvals and permits**
- **1 PPP project (DBFM)**
 - CAPEX €3.8bn
- **3 station modifications (D&B)**

Land acquisition = 3,300 plots

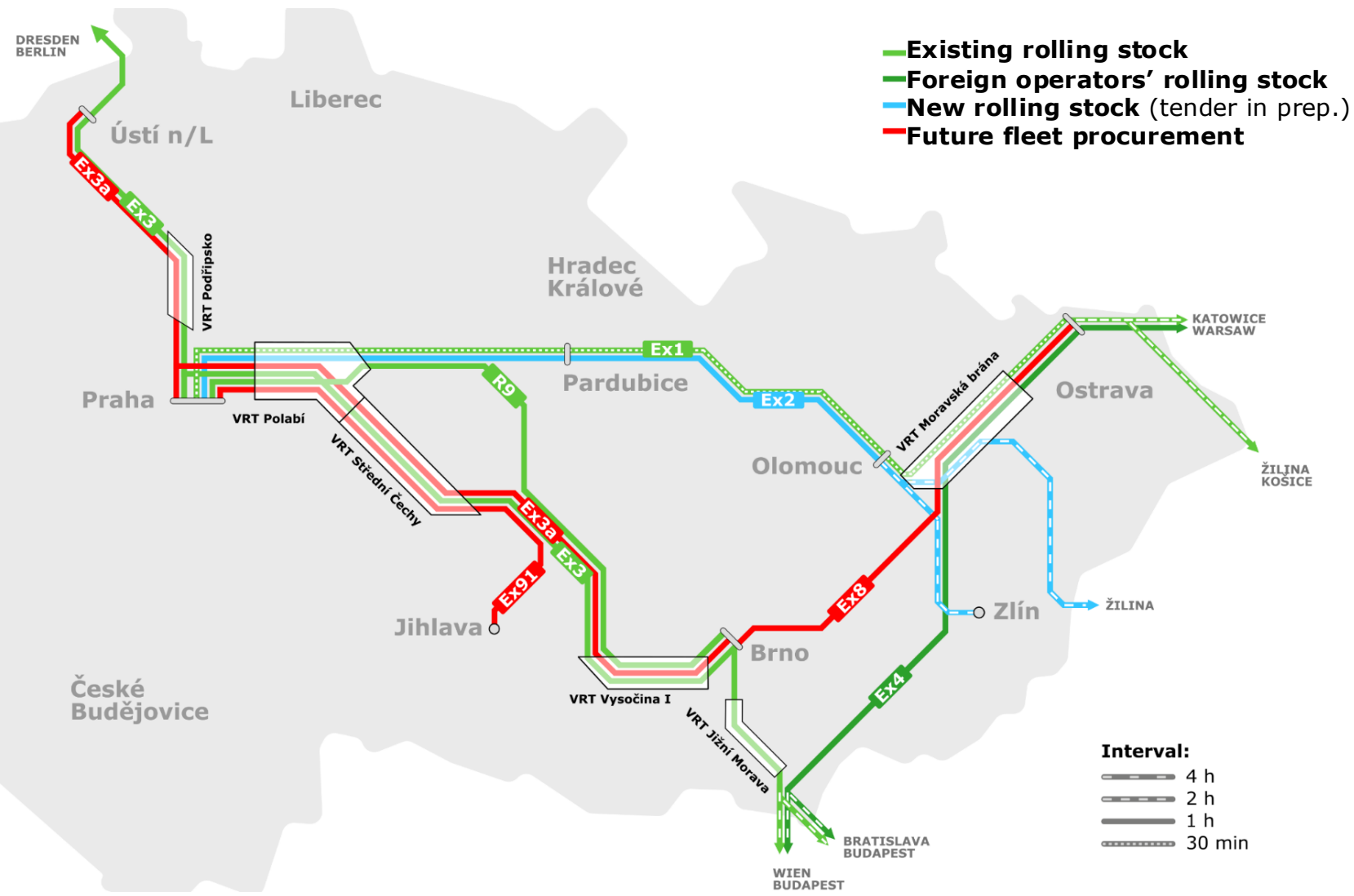
- **30 million m²**
- **Over 1,300 landowners**
- **CZK 3.3bn**



Moravian Gate HSL – Preparation Timeline



Initial Phase of HSL Operations





Spolufinancováno
Evropskou unií



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