



In designing and preparing new lines, Správa železnic has been working closely with the French national railway group SNCF since 2019. The technical solution in the Czech Republic thus takes into account the experience from more than 40 years of operation of the French high-speed LGV and TGV system. The cooperation has been successfully continued since 2022 thanks to an eight-year contract concluded between Správa železnic and SNCF Réseau in the technical areas of design, operation, diagnostics and maintenance as well as in the management of the preparation of large infrastructure projects or their promotion.

OPERATION

High-speed trains will be controlled by the unified European Train Control System (ETCS) Level 2. It consists of an on-board and a trackside part. The on-board part is mounted on vehicles, the trackside part is installed on the railway infrastructure. The connection between the two parts is based on the GSM-R mobile signal, but the design of the Czech high-speed lines does not exclude the possible installation of FRMCS or temporary simultaneous operation of both telecommunication systems.

The high-speed lines will be intensively maintained at night during the operational break. There will be road access to the railway line for road and dual on-

track-off-track (i.e. road and rail) vehicles to perform maintenance and repairs of the infrastructure. Správa železnic is preparing a maintenance base with facilities for workers and machinery for each approximately 100 kilometres of the high-speed line. Regular infrastructure maintenance will be provided from this base.

Trains on a high-speed line generate mainly aerodynamic noise (caused by the vehicle cutting the air). Noise, however, is not a major issue in the design of the line because it is short-term and can be effectively suppressed by the alignment of the line itself in a slight cut or by designed noise reduction measures – green embankments or noise barriers.



Contact

**Správa železnic, státní organizace
High-Speed Lines Construction Management**
V Celnici 1028/10, 110 00 Praha 1
www.spravazeleznic.cz/vrt
facebook.com/SpravazeleznicVRT
vrt@spravazeleznic.cz



Spolufinancováno
Evropskou unií



STÁTNÍ FOND DOPRAVNÍ
INFRASTRUKTURY



SPRÁVA
ŽELEZNIC



SPRÁVA
ŽELEZNIC

High-Speed Lines: Technology for the Railways of the Future

Czech high-speed lines will be compatible with high-speed trains common in Europe. This will be ensured by the EU regulation – Technical Specifications for Interoperability (TSI). Any TSI-compliant trains will be able to run in the Czech Republic - i.e. almost all existing high-speed trains in Europe. The trains for the high-speed lines will be selected by the carriers.

TYPES OF TRAINS

Only passenger trains will run on most of the planned high-speed lines in the Czech Republic, with the exception of the section between Litoměřice, Ústí nad Labem and the Czech border with Germany, where also freight trains will pass through the Central Bohemia Uplands and the Ore Mountains tunnels. All high-speed lines will be open to Cargo Sprinter freight trains carrying lightweight cargo on Euro pallets, mail or parcels.

SPEED

Lightweight high-speed train units with axle loads of less than 18 t will benefit from a maximum operating speed of up to 320 km/h on a high-speed line. However, the design speed is even higher, up to 350 km/h, and it will be possible to introduce it in the future. Increasing speed enhances the attractiveness of the railway. Four categories of trains are envisaged on the high-speed line: regional express at 200 km/h, fast train at around 230 km/h and express train at up to 320 km/h. The Sprinter category connecting major metropolises is expected to reach the same speed.

ALIGNMENT

The planned high-speed lines will be adjusted to the terrain and will run in cuttings, on bridges or embankments, or in exceptional cases in tunnels. Their design can take advantage of line gradients of up to 35 ‰ (assumption of operation of high-speed trains only). Conventional freight trains will not run on most high-speed lines. However, the operation of the high-speed line will relieve the existing railway, which is today very busy with long-distance passenger traffic. The radius of curves on the high-speed line will generally be more than 7 km. The larger the curve, the higher the possible speed on the line.

POWER SUPPLY

The High-speed trains on the new Czech high-speed lines will use for their propulsion the alternating current of the power supply system 2x 25 kV, 50 Hz, which is a globally proven and nowadays standard solution for high-speed lines. With this system, there is no need to locate substations close together, which means savings in this area as well.

PATHS OF PEOPLE AND ANIMALS

There will be no level crossings on high-speed lines, but only off-grade crossings and the line will be completely fenced to ensure the safety of both high-speed operation and people and animals in its neighbourhood. The line overpasses or underpasses roads, other railways, footpaths or wildlife migration corridors.

LINE DESIGN

The high-speed trains will run on ballasted tracks of conventional construction using rails, fasteners, sleepers and gravel. The turnouts on the high-speed line will be of three speed categories allowing trains to run to the branch line at 100 km/h, 160 km/h or 230 km/h. The crown of the high-speed double-track line will be about 11 metres wide – significantly less than for motorways. The rest of the space reserved for the high-speed line will be mostly grassed and set into the surrounding natural environment, with access roads for track and equipment maintenance or sites for technological buildings.

RAMS

High-speed lines are designed and operated as simply, reliably and safely as possible. This is ensured by the experts involved in their preparation and operation using RAMS management. The acronym RAMS describes the essential basic characteristics of a technical system, which is also a high-speed line: reliability, availability, maintainability and safety.

