

Advanced digital mapping solution for Czech railway infrastructure



Hexagon's Safety, Infrastructure & Geospatial division together with Ness Czech will provide the Czech Railway Administration with a Digital Technical Railway Map (DTRM). This railway-specific GIS solution will give the state organization access to information about its transport and technical infrastructure, allowing for more efficient preparation of investments and repair work. The DTRM

is based on the Technical Map Information System (ISTEM), developed by both Hexagon and Ness Czech to enhance the management of the railway infrastructure.

The Czech Railway Administration, as a railway operator, needs precise information about the railway network and surrounding area. By acquiring accurate and detailed geodetic measurements and digitizing asset and infrastructure information, the Railway Administration can meet its own needs and those of the state, which is developing the Digital Technical Map of the Czech Republic, a national map which should be operational in 2024.

The national map is being built across the country by connecting regional digital maps and others from the Railway Administration and the Directorate of Roads and Highways. The connection is provided by the [Czech Land Surveying and Cadastral Office](#), which has extensive experience in successfully managing cadastral mapping.

Beyond standard digital maps

Director general Jiří Svoboda said the Railway Administration considers the digital mapping project a high priority: "With the DTRM project, we will digitize the unprocessed part of the railway infrastructure, including networks. All data related to technical and transport infrastructure will be made available to regions, municipalities and every builder for the purposes of spatial planning and construction procedures. From this, we will speed up and improve the quality of building permits, especially in connection with the construction of high-speed lines, among other things."

The DTRM project is a complex system that includes a number of components, from the storage of primary data to the management of geospatial data to portal applications. All these processes are covered by the ISTEM system built on Hexagon technologies. Among other improvements, the system will ensure all changes are displayed to all users in real time.

"The customer has high demands and expectations for the project, which go beyond standard digital maps," says Martin Silvička, CEO of [Ness Czech](#). "Customizations, including a new data model, take into account specific requirements. For example, accurate geodetic measurements must be recorded in millimeters. The number of objects and the level of detail in their description is also above standard requirements. Because the infrastructure will be targeted with high precision, and DTRM will take over data from existing Railway Administration systems, the database will contain a huge amount of data."



Regional train in Czech Republic.

Long-term management of geodata

The DTRM project has been underway at the Railway Administration since September 2022. Completion is planned for the end of 2025, with support and development continuing until the end of 2027.

The scope of the project implementation is estimated at 20,000 employee days and includes other suppliers in addition to Ness and Hexagon: TKP Geo, ICZ, HSI, Altepro and Vars. The project consists of infrastructure, software, data, support and development. Data work includes the digitization, consolidation and harmonization of all data currently available to the Railway Administration, covering approximately 9,200 km of tracks, 27,000 km of technical infrastructure and an area of 21,000 ha. The delivery also includes three data centers.

"The DTRM information system will be a comprehensive system for storing, managing and sharing all types of geographic data within the organization. Thanks to this project, the Railway Administration will not only fulfill the legislative requirements in connection with the Digital Technical Map of the Czech Republic, but at the same time it will acquire a GIS platform for the long-term management of geographical data in 2D and 3D, which can become a solid basis for future projects," states Jakub Svatý, country manager of [Hexagon's Safety Infrastructure & Geospatial division](#) in the Czech Republic.

Ness Czech customers in the field of digital technical maps also include the Institute of Planning and Development of the Capital City of Prague, the Central Bohemian Region and the Czech Land Surveying and Cadastral Office. In addition to Czech Railway Administration, Hexagon supports railways and transit systems in Canada, Germany, Italy, Switzerland, the United States and elsewhere with geospatial and safety solutions.

<https://www.gim-international.com/content/news/advanced-digital-mapping-solution-for-czech-railway-infrastructure>
