

## 1. The Role of the Organisation for Co-Operation between Railways in Rail Freight Transport in the Eurasian Space

Mirosław Antonowicz

pages: 87-95

*Summary.* The Organisation for Co-Operation between Railways (OSJD) is an international organisation established on the basis of an international agreement. The OSJD brings together 30 countries of Asia and Europe. It successively strives to develop and improve rail transport in the Eurasian space through the development and improvement of international transport corridors, as well as unification of transport law. Rail freight transport corridors are an important element of the activities of the Organisation for Co-Operation between Railways. Activities related to the development of transport in the Eurasian space are aimed at the modernisation and development of rail transport by improving the technical and operational parameters of corridors border crossing points, standardisation of terminology used in freight transport and digitalisation of operational and transport processes in order to improve the competitiveness of railways in cargo transport in Asia and Europe. As part of its activities, the OSJD aims to continuously improve rail freight transport by simplifying border procedures and harmonising transport documents. This article aims to present the role of the Organisation in the development of rail freight transport in the Eurasian space in recent years. The scope of this study includes a synthetic analysis of the most important achievements of the organization in recent years in the context of practical application in freight transport.

*Keywords:* rail transport, consignment note, digitalisation, ecology, single window system, transport corridor, Intermodal transport

## 2. Railways in Podlaskie

Marek Graff

pages: 97-112

*Summary.* The railway network in the Podlaskie Voivodeship has undergone refurbishment and modernization in recent years as part of the ongoing major investment program – the construction of the Rail Baltica line/modernization of LK 6, connecting Białystok with Warsaw. Since the vast majority of lines in the region are non-electrified, the funds allocated by PLK are fairly low compared to other voivodeships. One specificity of the Podlasie region is the presence of transshipment stations with a 1520 mm railway gauge, which is due to the proximity to Belarus. The construction of the Rail Baltica line, i.e., the standard gauge line connecting Poland with the Baltic States, is the biggest investment in the voivodeship, which will cut the travel time and enable increased speeds, and also enable upgrades to outdated railway infrastructure: manual signalling at the Białystok station, single-track sections on LK 6, etc. Further, it will make it possible to modernize stations other than Białystok and Elk, e.g., Czyżew, Łapy and Szepietowo. Compared to other Eastern voivodeships, Podlaskie has no city rail development programs, unlike those in Podkarpackie (already operational) and Lubelskie (currently in the planning phase). Private operators providing passenger transport services are virtually non-existent on the local market; however, this is beginning to change as of early 2024..

*Keywords:* Podlasie, Rail Baltica, Białystok, Polish-Belarusian state border

### 3. Modernization of Railways in the Warmińsko-Mazurskie Voivodeship

Marek Graff

pages: 113-132

*Summary.* This article presents the current state of railway infrastructure – a description of modernized and refurbished lines, plans for further refurbishment, and the rolling stock management procedures currently underway. The use of railways in the Warmińsko-Mazurskie Voivodeship in transport of passenger and goods is low, and most initiatives are due to centrally managed railway companies (PKP IC, PKP PLK) rather than the local marshal's office. This is due, on the one hand, to the lack of major industrial plants as customers for the railways and, on the other hand, to the relatively low income of the local population, who rarely use rail services. The most crucial investments made in the region are the modernization of Olsztyn Główny and Elk stations, the construction of a new Olsztyn Główny station, and the modernization and electrification of line LK 38 between Elk and Korsze.

*Keywords:* Olsztyn, Mazury, modernization of railways in Poland

### 4. Transition Curves for High-Speed Railways

Władysław Koc

pages: 133-146

*Summary.* This paper focuses on conditions for the use of transition curves on high-speed railways. The Technical Specifications for Interoperability (TSI), relating to the "Infrastructure" subsystem of the EU railway system, leave a large margin of discretion in this regard (delegating final resolution of a given problem to national regulations). Based on the applicable EU and national rules, acceptable values for the kinematic parameters that should correspond to the design of transition curves have been proposed. A number of cases were considered, setting minimum values for horizontal curve radii and lengths of transition curves, depending on train speed and cant on the curve. The transition curves that would likely be the most representative from the point of view of high-speed railways were selected: the clothoid, the Bloss curve and a new curve with a smoothed curvature at the end section. Guided by previously established principles, the parameters of the test geometric layouts, which were the subject of comparative analysis, were determined. The analysis showed that smooth transition curves (such as the Bloss curve) cause problems with the shape of the track axis at the initial section; this applies to both horizontal ordinates and gradient due to cant ordinates. For this reason, there have been doubts about the applicability of these curves on conventional railways. On high-speed railways, the constraints of shaping the initial section may be multiplied by the much larger radii of horizontal curves and lengths of transition curves adopted. As such, they do not correspond to the conditions found on these railways. These conditions are undoubtedly met by a clothoid transition curve, but the proposed new form of the curve, which provides a smoother transition to a circular curve on its end section, seems more favourable.

*Keywords:* high-speed railways, transition curves, kinematic parameters, comparative analysis of test layouts, selection of the most favourable solution

### 5. Selected Properties of Welded Railway Rail Joints Made of R260 and R350HT Steel

Małgorzata Ostromecka

pages: 147-155

*Summary.* This article presents the results of studies of 60E1 profile welded railway rails joints made of R260 and R350HT steel using flash resistance welding. The study included macro- and microstructural analysis, HV30 hardness distribution in the base material, heat-affected zone, and weld line. The results indicate proper welding, no defects, and compliance of mechanical properties with standard requirements, with higher hardness for joints made of R350HT steel.

*Keywords:* flash welded rail joints, microscopic and macroscopic examination, hardness distribution