TRANS TRITIA

D.T2.2.2 Report **3.2020**

Road to Rail Potential shift of transport flows

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Content

1. INTRODUCTION

The study explores the possibilities and technical requirements for moving part of the freight transport volume in the TRITIA region from road to rail, particularly on the routes of the European corridors. The main purpose of D.T2.2.2 is to describe the opportunities for freight transport in the investment, organizational and legislative areas and be input for D.T2.2.4.

1.1. Specification of the area of interest

The area of interest is the TRITIA region, ie economically and thus also the traffic - very exposed area of the border area of the Republic of Poland, the Czech Republic and the Slovak Republic. The region covers an **area of 34,069 km2** and has a population of **7,885,000.**

There are two towns with approx. Inhabitants - **Katowice** 312 thousand and **Ostrava** 294 thousand and 15 other cities with more than 80 thousand - Częstochowa 227 thousand, Sosnowiec 222 thousand, Gliwice 197 thousand, Zabrze 189 thousand, Bytom 185 thousand, Bielsko-Biała 174 thousand, Ruda Śląska 145 thousand , Rybnik 141 thousand, Tychy 130 thousand, Dąbrowa Górnicza 129 thousand, **Opole** 128 thousand, Chorzow 114 thousand, Jaworzno 96 thousand, Jastrzębie-Zdrój 94 thousand, Zilina 83 thousand. (settlements of regions highlighted in bold).

Figure 1 – Region Tritia

1.2. Aim of project

The project aims to improve coordination between freight transport stakeholders with the aim of increasing multimodal environmentally friendly freight solutions. Means include improving information, planning and coordination between regional authorities, transport network managers and freight participants. The project focuses on cross-border, transnational and interregional cooperation in order to strengthen economic and social cohesion in order to achieve the objectives defined in the Europe 2020 strategy or the EU White Paper on Transport. The specific objective is to explore the possibilities, technical requirements and organizational prerequisites for shifting a significant part of the traffic load from the transport of products from road to rail.

2. EUROPEAN CONTEXT

2.1. White paper

The full title of the document is 'Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system' (COM (2011) 144 final).
The objectives formulated in this document are primarily to minimize the environmental impact of transport. In particular, Europe's dependence on oil imports should be reduced, while transport carbon emissions should fall by 50% by 2050 in the context of increasing transport and promoting mobility. In view of the importance of railway transport in achieving these objectives, there is a substantial intention to transfer 30% of road freight transport over 300 km by 2030 to other modes of transport, such as rail or shipping, and by 2050 it should be more than 50 %.

2.2. Transport network TEN-T

Figure 2 – TEN-T network

"Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010 / EU (TEN-T)" contains relevant principles therein contained.
For example, paragraph (31): 'Due to its large scale, the trans-European transport network should provide the basis for the widespread deployment of new technologies and innovations that can, for example, contribute to increasing the overall efficiency of the European transport sector and reduce its carbon footprint. From a purely transport point of view, paragraph (32) can be mentioned: 'The trans-European transport network must ensure effective multimodality in order to allow passengers and goods to make a better and more sustainable choice between modes of transport and to consolidate large volumes transported over long distances.

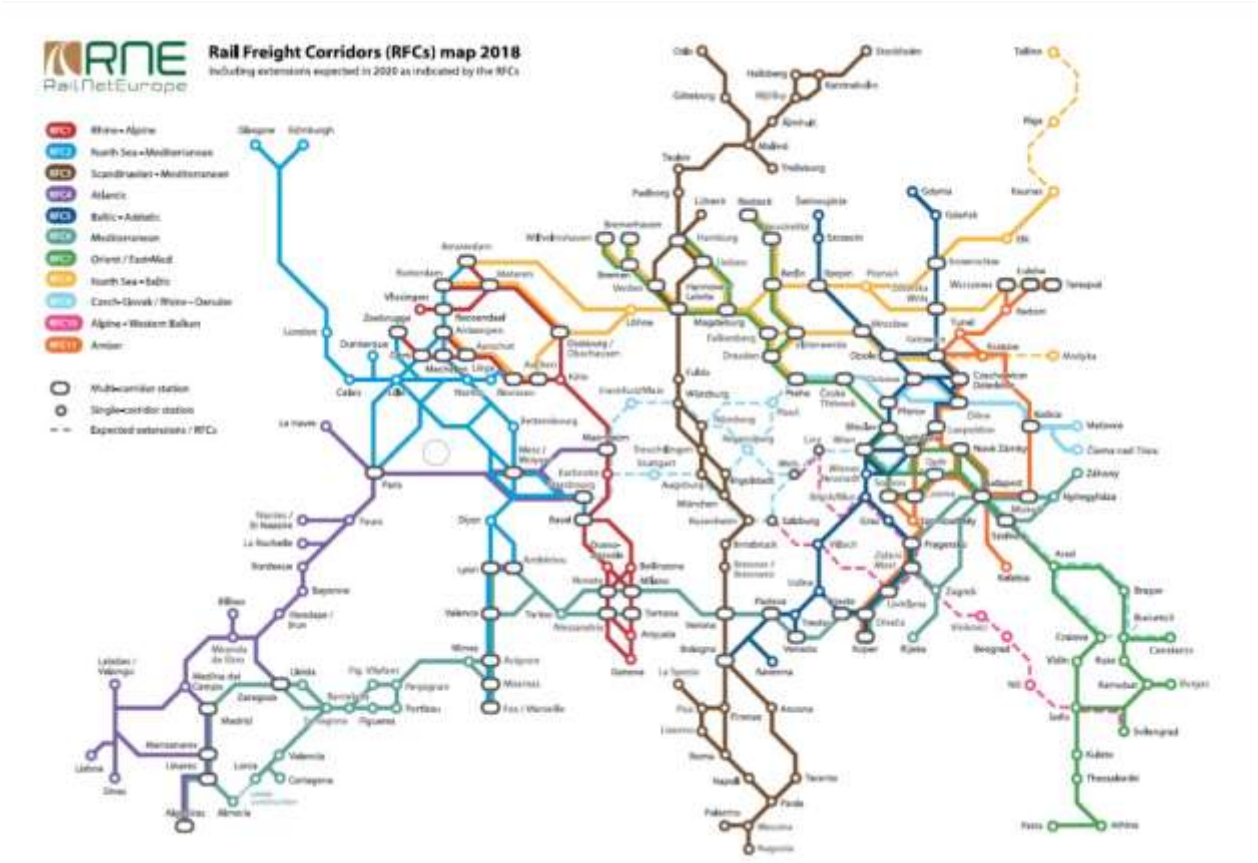
2.3. Railway corridors RFC

The Regulation (EU) No. 913/2010 concerning a European rail network for competitive freight became effective on 9 November 2010. This Regulation required Member States to establish international market-oriented RFCs in order to meet three main challenges:

- strengthening co-operation between IMs on key aspects such as the allocation of paths, deployment of interoperable systems and infrastructure development
- finding the right balance between freight and passenger traffic along the RFCs, giving adequate capacity for freight in line with market needs and ensuring that common punctuality targets for freight trains are met

- promoting intermodality between rail and other transport modes by integrating terminals into the corridor management process

Figure 3 – RFC corridors



2.4. Low-carbon economy

The document entitled “Roadmap for moving to a competitive low carbon economy in 2050, COM (2011) 112 final”, aims to keep climate change below + 2 ° C. It is essentially about reducing greenhouse gas emissions by 80-95% by 2050 compared to 1990. Of course, these plans also apply to transport.

2.5. Smart and sustainable grow

The document entitled "A strategy for smart, sustainable and inclusive growth, COM (2010) 2020 final" contains five main objectives. These define what the EU should achieve by 2020. One of these objectives is climate and energy. Member States are committed to reducing greenhouse gas emissions by 20% by 2020, increasing the share of renewables in the EU energy mix to 20% and achieving the 20% energy efficiency target. Subsequently, the EU summit on 23 and 24 October 2014 brought in the agreement more precise targets for 2030 (30% reduction in CO2 production, 30% renewables, 27% increase in energy efficiency). The EU Winter Energy Package of 30/11/2016 proposes to increase energy efficiency (ie reduce energy consumption) by 30% by 2030. This objective is unlikely to be achieved without substantial changes in transport - that is, greater use of less energy-intensive water and rail transport.

3. NATIONAL CONTEXT

Of course, all participating countries also have their national documents, which respond both to the current and promising state of the railways and to the relevant European documents.

3.1. Czech republic

3.1.1. Government Resolution No. 978/2015

Report of the Ministry of Transport on Government Implementation 978/2015
Part 7. Tasks of the Minister of Transport
- a) enable, by 31 December 2023 from the Operational Program Transport, support for the construction of pumping and charging infrastructure for alternative drives in transport,
- b) ensure completion of the backbone network of road capacity capacities for motor transport by 31 December 2030,
- c) to allow by 31 December 2020 from the Operational Program Transport to support the construction of bypasses of towns and municipalities referred to in Article 18 of the Program and in air quality improvement programs for individual zones and agglomerations,
- d) to submit to the Government by 30 June 2016 information on how to ensure the transfer of at least 30% of freight traffic over 300 km from roads to rail,
- e) issue, in cooperation with the Minister of the Environment, an amendment to Decree No. 527/2006 Coll., on the use of toll roads and amending Decree of the Ministry of Transport and Communications No. 104/1997 Coll. Roads, as amended, reassessing the charging of roads bypassing cities with effect from 1 January 2017,
- f) to elaborate, in cooperation with the Ministers of the Interior and the Environment and the Government, by 30 June 2016 to submit a draft amendment to Act No. 56/2001 Coll., on Conditions of Vehicle Operation on Roads reduction of emissions in road vehicles, including the introduction of sanctions for the removal of such installations, with the proposed effect from 1 July 2017,
- g) to elaborate, in cooperation with the Minister of the Environment and the Government, by 30 June 2016, submit a draft amendment to Act No. 56/2001 Coll., on Conditions of Vehicle Operation on Roads,

3.1.2. Transport Policy of the Czech Republic for 2014-2020 with a view to 2050

The approved transport policy (Government Resolution No. 449 of 12 June 2013) accepts all decisive documents and intentions of European documents. Therefore, all the considerations and calculations contained in the chapter on relevant European documents are fully compatible with the Transport Policy of the Czech Republic.
The following is worth mentioning:

- Regulation of night road haulage
- Support for inland waterway transport under the Naiades and Naiades II programs
- Ensure the functioning of rail freight corridors - modernize by 2030
- Ensure the viability of large railway junctions

- Expansion of regular multimodal freight lines
- Internalize external costs as a source of funding for transport infrastructure

3.1.3. Phase 2 transport sector strategies

Phase 2 transport sector strategies were approved by the Czech Government Resolution No. 850 on 13 November 2013. The strategies deal with future development scenarios, transport forecasts, identification of measures for the development of transport infrastructure, financial possibilities and implementation of transport sector strategies.

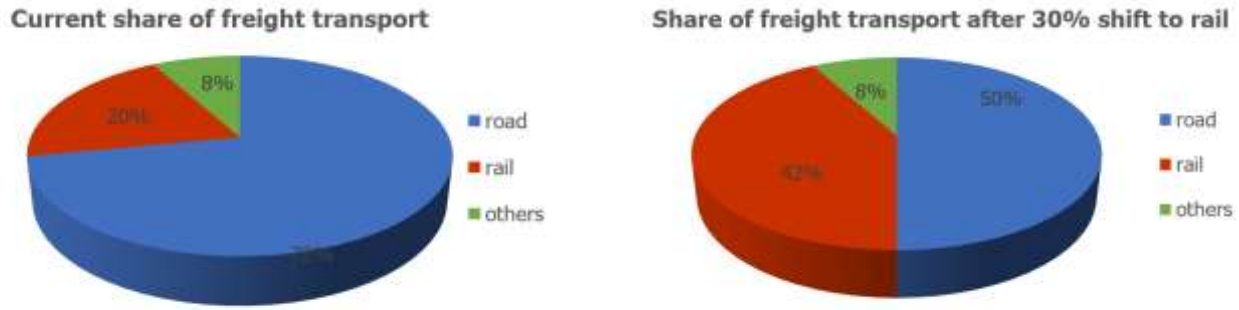
This strategy identified bottlenecks in the TEN-T network - the Ostrava hl.n. - insufficient parameters of line 301A Dětmarovice - Mosty u Jablunkova. Furthermore, bottlenecks on the railway infrastructure in terms of insufficient capacity - within the TRITIA region sections on line 305B Bohumín - Ostrava hl. n., Ostrava hl.n. - O.Svinov, line 321 Odb.Odra - Ostrava Svinov, line 301F Ostrava-Svinov - Opava east, line 302B Č. Těšín - Frýdek Místek, line 302A line O.Kunčice - Frýdek Místek, line 310A line Opava East - Krnov - Valšov and on the line 301G railway station Ostrava střed.
The modernization of the Olomouc - Opava - Ostrava line has been included in the list of measures on the railway infrastructure.
Within the RS / VRT routes, the strategy included improving the quality of interconnections in the Přerov - Ostrava - CZ / PL state borders.

3.1.4. Freight transport concept for 2017-2023 with a view to 2030

This document was adopted by the Government of the Czech Republic in its Resolution No. 57 of 25 January 2017. The text analyzes in detail the freight transport market, the prerequisites for its further development and the implementation of the relevant European documents. It also defines suitable regions for the placement of terminals for continental combined transport and the position of neutral (public) multimodal transport terminals. In terms of the structure of meeting freight transport needs, it also analyzes the preconditions for the White Paper target of shifting 30% of the current road freight transport over 300 km in the EU to rail or waterborne transport. It is noted that the Czech government also signed up to Resolution No. 978/2015 to move 30% of road freight transport over 300 km to rail or water transport by 2030.
Selected measures:

- ensuring interoperability, harmonizing charging
- support for routes for oversized transport
- support for multimodal and combined transport
- greater use of rail and water transport over longer distances
- internalization of externalities
- liquefied gas in road and water transport
- support for public combined transport terminals

Figure 4 – Assumed percentage of traffic distribution according to the Resolution of the Government of the Czech Republic 978/2015 status quo and after 30% transfer from road to other modes



3.2. Poland

3.2.1. National Development Strategy

On February 14, 2017, the Council of Ministers adopted a new medium-term development strategy for the country of SRD (called the Strategy for Responsible Development until 2020 (with a perspective to 2030)), which is a key document in the area of medium and long-term economic policy of the state. The objectives, directions of intervention, strategic actions and projects indicated in the SRD should be reflected in the strategic documents. In this sense, the SRD is the basis for the preparation of new sectoral strategies, including transport strategy.

In accordance with art. 9 of the Act on the principles of conducting development policy, the SRD is a document specifying the basic conditions, objectives and directions of the country's development in the social, economic, regional and spatial dimension, covering the period up to 2020, with a perspective up to 2030, implemented by development strategies (including Development Strategy) Transport 2030) and through programs, taking into account the EU programming period. The development of transport is the basis of an effectively functioning economy, directly affecting the implementation of the main objective of the SRD, i.e. creating conditions for the growth of income of Polish residents while increasing social, economic, environmental and territorial cohesion, as well as three specific objectives:

- sustainable economic growth based increasingly on knowledge, data and organizational excellence;
- socially sensitive and territorially sustainable development;
- an effective state and institutions for growth and social and economic inclusion;

To achieve the above SRD objectives will be supported by the implementation of intervention directions and measures indicated in SRT2030, which are a detailed specification of SRD records in the area of transport. The strategy is consistent with the medium-term SRD, including the target set for the transport sector, i.e. increasing transport accessibility and improving the conditions of providing services related to the transport of goods and passengers. SRT2030 also takes into account the directions of intervention specified in the SRD, i.e.: Monitor Polski - 11 - Pos. 1054 13

- improving and developing an integrated, interrelated transport network serving a competitive economy;

- changes in individual and collective mobility;
- improving the efficiency of using public funds for transport projects;

In addition, SRT2030 contains strategic projects in the area of transport specified in the SRD, which have been assigned to the appropriate directions of intervention. In addition to the implementation of the objectives of the SRD, SRT2030 takes into account the objectives and priority actions identified in strategic national and EU documents, including in the Strategy for Smart and Sustainable Inclusive Europe 2020, as well as in the National Reform Program (NRP) for the implementation of the Europe 2020 Strategy and in the White Paper. Plan to create a single European transport area - strive for a competitive and resource-efficient transport system. "

3.2.2. Strategy for Sustainable Development of Transport until 2030 (SRT2030)

SRT2030 is a planning document which, in accordance with the Act of 6 December 2006 on the principles of conducting development policy (Journal of Laws of 2019, item 1295), hereinafter referred to as the "Act on the principles of conducting development policy", is an integral element of management system for national strategic documents. The essence of SRT2030 is to indicate the goal and outline directions for the development of transport, so that by 2030 it will be possible to achieve the goals set in the Strategy for Responsible Development by 2020 (with a perspective to 2030 (hereinafter referred to as SRD)).
The provisions of SRT2030 are consistent with the 'Agenda for Sustainable Development - 2030' adopted by the General Assembly of the United Nations (UN) in 2015 and its 17 Sustainable Development Goals (SDGs). At the same time, SRT2030 maintains coherence and complementarity with the objectives and priority actions indicated in the remaining eight integrated development strategies of the country. It assumes the continuation of intentions indicated in current national planning documents of the transport sector, it also takes into account trends and directions of changes indicated in sectoral and horizontal EU documents. It also introduces new solutions necessary to meet the requirements of the transport sector in the first half of the 21st century. Due to the fact that a significant part of the goals of transport development will be achieved in a time horizon longer than by 2020, this document goes beyond 2020 and thus presents the most important actions necessary to take in the perspective of 2030. These mainly include capital-intensive ones and time-consuming investments in transport infrastructure, transformation of management systems and introduction of innovative ("smart") solutions that facilitate the functioning of infrastructure within the entire transport system and in the intermodal dimension. The implementation of SRT2030 will affect a number of existing development policy documents at national, regional and local level relating to transport. In this case it may be necessary to adapt the abovementioned documents to SRT2030. In the implementation horizon of SRT2030, actions will be taken to use the model-analytical approach in the area of programming the strategic transport policy of the state to a broader extent than before. To this end, a multi-branch traffic model will be developed, which will be one of the important elements of this process[1].

[1] Depending on the adopted implementation variant of the enabling conditions for the perspective2021-2027 it will be possible for the minister competent for transport to prepare a presentation document results of the demand analysis.

Implementation of the main objective in the perspective up to 2030 involves the implementation of six directions of intervention appropriate for each of the modes of transport:

- intervention direction 1: **construction of an integrated, interrelated transport network serving a competitive economy**;
- intervention direction 2: **improving the organization and management of the transport system**;
- intervention direction 3: **changes in individual and collective mobility**;
- intervention direction 4: **improving the safety of traffic participants and of goods transported**;
- intervention direction 5: **limiting the negative impact of transport on the environment**;
- intervention direction 6: **improving the efficiency of using public funds for transport projects**.

3.2.3. National Railway Program until 2023 - updated by resolution No. 186/2017 of the Council of Ministers of December 4, 2017.

The National Railway Program until 2023 (NCP) is a multi-annual program covering investments on railway lines, which are co-financed by the minister competent for transport.
This document implements the strategies adopted by the Council of Ministers, including "National Development Strategy 2020" and "Transport Development Strategy until 2020 with a perspective up to 2030".
The National Railway Program is valid until 2023, i.e. until the option of financing projects under the European Union's financial perspective for 2014-2020 ends. The document defines the amount and sources of financing (including EU funds and national funds), and also provides the basis for ensuring investment financing in accordance with the Public Finance Act.

3.2.4. Program "Assistance in financing the costs of railway infrastructure management, including its maintenance and renovation until 2023"

The "Assistance in financing the costs of railway infrastructure management, including its maintenance and renovation up to 2023" program, approved on 16 January 2018 by Resolution No. 7/2018 by the Council of Ministers, sets out the financial framework and conditions for implementing the state's plans in the field of railway infrastructure management.
The main goal of the program is to strengthen the role of rail transport in the integrated transport system of the country by reversing the downward trend of the share of rail transport in transport and to provide the necessary funds for maintenance and repair work on the existing rail network. These works will allow maintaining technical parameters of modernized railway lines and systematic improvement of the situation on other lines.
The program is financed from the state budget and the Railway Fund. Approximately 23.8 billion PLN, including approximately PLN 21 billion from the state budget, will be allocated for its implementation in 2019-2023 from public funds.

3.2.5. The Local + Regional Railway Infrastructure Replenishment Program by 2028

On December 3, 2019, the Council of Ministers adopted a resolution on establishing a Program to Supplement the Local and Regional Railway Infrastructure Rail + by 2028. The Railway + program will contribute to the elimination of transport exclusion thanks to the possibility of supplementing the railway network with new connections, which will primarily provide passengers with access to inter-voivodship communication. This will mainly apply to cities with population over 10,000. residents who currently do not have access to passenger or freight railways. The implementation of the program will facilitate access to passenger railways, improve business conditions and road safety (part of freight transport will be taken over by rail transport). The program is addressed to local government units.
Nearly PLN 6.6 billion will be allocated to its implementation in the years 2019-2028.

- approx. PLN 5.6 billion will come from the capital injection of the company PKP Polskie Linie Kolejowe SA;
- approx. PLN 1 billion is to be the own contribution of local government units (e.g. bonds, loans).

The program consists of three components:

- investment
- organization of passenger transport,
- protection of railway infrastructure against decommissioning.

The investment component is basic, the other two are complementary.
Co-financing of the investment component will take place from the recapitalization of the company PKP Polskie Linie Kolejowe SA. The implementation of this component is part of the construction and modernization of railway lines.
Investment tasks will be able to be financed in 85 percent. from the program, and in 15% from local government funds.

3.2.6. Development Strategy of the Silesian Voivodeship Transport System

To ensure compliance with the National Transport Development Strategy until 2020 (with a perspective to 2030) and with the National Spatial Development Concept 2030 and the National Regional Development Strategy for 2010-2020, as well as with the EU White Paper, the Strategy for the Development of the Transport System of the Śląskie Voivodeship has long-term nature and sets goals and activities until 2030, taking into account the operating conditions and development forecasts for various branches of transport and public transport. To ensure compliance with the time horizon of the National Development Strategy 2020, i.e. until 2020, it is assumed that the objectives adopted in the Strategy are the same for both time horizons, i.e. 2020 and 2030. As regards the implementation of the strategy, the projects have been divided into two stages, i.e. until 2020 and until 2030.
The Board of the Śląskie Voivodeship in accordance with art. 39 of the Act on providing information on the environment and its protection, public participation in environmental protection and on environmental impact assessments of October 3, 2008 (consolidated text: Journal of Laws of 2017, item 1405, as amended) announced that by Resolution No.

1880/278 / V / 2018 of the Management Board of the Śląskie Voivodeship of 16.08.2018, the Strategy for the Development of the Transport System of the Silesian Voivodeship was started. The update of the Development Strategy for the Transport System of the Śląskie Voivodeship aims, among others, at adaptation of the provisions of the current document to newly adopted and currently prepared documents at the governmental level, including the Strategy for Responsible Development (SRD) and adaptation to the changing needs and identification of new transport solutions for the Śląskie Voivodeship.

3.2.7. Railway development plan in the Śląskie Voivodeship. Implementation document to the Strategy for the Development of the Silesian Voivodeship Transport System

The railway development plan in the Śląskie Voivodeship is an implementation document for the Strategy for the Development of the Silesian Voivodeship Transport System. The plan defines operational goals to be implemented in the area of rail transport using the resources of the Regional Operational Program of the Śląskie Voivodeship for the years 2014-2020 (RPO WSL). Then, it defines a set of project selection criteria that were used to compile the investment ranking, as well as basic information about planned investments and project implementation schedule. The necessity to implement the Plan results from the provisions of art. 19 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council.

3.3. Slovakia

3.3.1. Strategic Transport Development Plan of the Slovak Republic up to 2030 – Phase II

This document was published on December 2016 and is one of the most recent strategic publications related to the transport as whole.

General Objectives for Freight Rail Transport (primarily for Čadca - Žilina - Košice):

- Strengthen the role of rail as a carrier mode in the public transport system where warranted
- Increase the share of rail freight transport in total transport performance
- Improve the safety, efficiency and sustainability of transport operations by strengthening new technologies
- systematically reduce the negative socio-economic and environmental impacts of transport
- To systematically increase the safety and security parameters of point and line elements of the transport system

Measures to promote rail freight transport:

- Completion of modernization of the main TEN-T lines, which are in a high stage of preparation: Púchov - Žilina, Žilina - Čadca - st. border
- Modernization of back track Žilina - Košice - Čierna nad Tisou

- Modernization of the TEN-T line: Púchov - Horní Lideč
- Periodic preparation of transport infrastructure maintenance plans

Measures to promote intermodal transport:

- Improving the conditions for combined transport and the operation of coherent freight trains and promoting the interoperability of freight vehicles (organizational, infrastructure and vehicles),
- Periodic preparation of transport infrastructure maintenance plans.

3.3.2. Pilot Interreg project Chem Multimodal of Duslo, a.s. Šaľa

The scope of the project is to evaluate and establish pilot project for connection of the Duslo plant in Šaľa with the customers around the Europe, throught the logistic chain of multimodal transportation.
Duslo, a.s. is one of the most important chemical industry companies in Slovakia. Throughout its history, it has grown into a well-established producer of fertilizers with European significance and a global supplier of rubber chemicals. Duslo, a.s. is a part of the AGROFERT group, international holding of companies that operate in chemical, agricultural, food production, forestry, lumber, land and transport technology, renewable resources and media sectors.

Table 1 - The main lines considered in the project

From	Transshipment	Destination	Mods (km)	Mounthly quantitiy (t)
Duslo	-	Lyon - France	Rail – 1 327 km	5 000 t
Duslo	Dunajská Streda	Rotterdam – Holland	Rail – 1 284 km Road – 37 km	500 t
Duslo	-	Barcelon - Spain	Rail – 1 963 km	1 500 t
Duslo	Dunajská Streda Rotterdam Kingston	Yorkshire - England	Road – 152 km Rail – 1 284 km Sea – 338 km	2 400 t
Duslo	Dunajská Streda Rotterdam	Caldas de Reis – Spain	Road – 37 km Rail – 1 284 km Sea – 1 800 km	780 t
Duslo	Dunajská Streda Rotterdam	Gafanha da Nazare – Portugal	Road – 37 km Rail – 1 284 km Sea – 1 900 km	1 300 t

As shown on table above, two of the planned routes will be carryed out as clasic freight railway transport in freight wagons. The four other routes will be executed by containers with on route transshipment in strategic points for optimaliztion of the route. The project is now in pre pilot phase (as of December 2018) and it is expected to be putted into operation in the near future.

3.3.3. Support of intermodal transportation

The main tools for the support of combined transport in the SR, especially in terms of infrastructure building, are the operational programs of the ICE SR, ie. **Operational Program Transport 2007 - 2013** (in which an intermodal terminal was built in Žilina - Teplička) and the current Operational Program Integrated Infrastructure. **The OPII 2014-2020 under Priority Axis 1** (Railway Infrastructure (TEN-T core) and Mobile Renewal) mentions the construction of intermodal terminals as one of the objectives, provided that appropriate market conditions are created. At this point, it is stated that, in addition to the modernization of railway lines, an additional opportunity for the development of railway infrastructure is also to increase its capacity utilization and the development of combined transport. This requires building intermodal terminals to cover the increasing volumes in this transport system and ensuring readiness for eventual growth in continental transport, with the prospect of extending Asia's direct link with the EU. The long-term goal of ICE SR is to build a basic network of public intermodal transport terminals to improve access to quality terminal and logistics services. Based on the EC Decision (EC Decision (2013) 4423 of 17 July 2013 on State aid SA.34369 –2013 / C Construction and operation of public intermodal transport terminals), the issue of building public terminals in the Slovak Republic can be reopened after a year. 2018, when the Ministry of Transport will prepare a new analysis of the possibilities of construction of public intermodal transport terminals. In the future, the granting of public financial assistance for the construction of additional terminals will be subject to a new Commission decision on State aid.

Support for combined transport for the years 2020 -2024.
A strategic document of the Ministry of Industry and Trade of the Slovak Republic focusing on the support of intermodal transport is currently under preparation. This support will not affect the construction of new infrastructure (construction or extension of terminals, extension of railway infrastructure and the like).
Two areas to be supported financially over the period 2020-2024:

- Co-financing the costs of setting up and operating new scheduled services between terminals in the framework of continental transport (except for shipping containers).
- Co-financing the purchase of technical equipment for intermodal transport terminals.

The document is in preparation and is being prepared in cooperation with terminal operators in Slovakia. This interconnection will ensure the real usability of funds for the development of combined transport while maintaining the market principles of business in this sector. The final text and complete details will be known upon completion and publication of the document.

In addition to **these instruments**, the state has long supported the combined transport sector through rapid action and strategies:

- In 1994, the Government of the Slovak Republic signed an approach to the AGTC (European Agreement on Major International Combined Transport Routes and Related Objects) agreement, according to which the time limit of 30 minutes of train stay should be respected when crossing state borders,

- Since 1996, the Program of Support for the Development of Combined Transport in the Slovak Republic has been implemented with the validity until the year. 2010. It was a program for small and medium-sized enterprises in the field of combined transport,
- At the initiative of the Combined Transport Department, the Combined Transport Section was created at the Freight Transport Division of the Railway Company a.s. (ZSSK) in 1998,
- On 17.1.2001 the Government of the Slovak Republic approved by Resolution no. 37/2001 "Concept for the development of combined transport with a view to 2010",
- On January 23, 2001 the Agreement between the Slovak Republic and ŽSR on the support of combined transport operation in the RoLa system was signed for 2001-2005,
- The Ministry of Transport, in cooperation with the Ministry of Finance of the Slovak Republic and the Customs Directorate in Bratislava, resolved the customs clearance of integrated KD trains at the combined transport terminals. In cooperation with ŽSR, MÁV, ČD and DB, the issue of handover of combined transport trains across borders was solved in confidence.,
- Motor vehicles that perform combined transport with a total weight of over 7.5 t and trucks with a trailer do not have a traffic restriction on 7 days of working off periods. This is specified in more detail in the Act of the National Council of the Slovak Republic No. 315/1996 Z.z. as amended by later regulations on road traffic (Section 36 (3) (d)))),
- Advantages of tax reduction for vehicles used in combined transport according to the conditions of §7 of the Act of the National Council of the Slovak Republic no. 361/2014 Z.z. on motor vehicle tax,
- In the framework of international cooperation, intergovernmental bilateral agreements on combined transport are signed with the Czech Republic, Hungary, Austria, Slovenia, Croatia, Bulgaria, Poland, Latvia, the Netherlands, Romania, Estonia, Ukraine, Macedonia and Serbia,
- On the initiative of combined transport operators, the Association of Forwarders of Slovakia and the Association of Employers of Transport, Posts and Telecommunications of the Slovak Republic, the Association of Combined Transport was established. The Combined Transport Council was established at the Association of Employers of Transport, Posts and Telecommunications of the Slovak Republic (today the Union of Transport, Posts and Telecommunications of the Slovak Republic). The basic objective of the Council is to assist in the development of the CP. The Council is represented by selected central state administration bodies, University of Žilina, ZSSK Cargo, a.s., SPaP a.s., operators of KD, ČESMAD Slovakia, Union of Forwarders of Slovakia,
- Awareness of the importance of combined transport is carried out in professional journals as well as in electronic media. Since 1996, an international conference called EUROKOMBI has been organized and is currently replaced by the international scientific conference Horizons of Railway Transport, organized by the University of Žilina,

- In cooperation with the Ministry of Finance of the Slovak Republic, Principles were issued for the provision of special-purpose subsidies from the state budget for technical equipment of combined transport. The policy was approved by PVM on 2.10.2001. The subsidy was provided for the purchase of new large containers, swap bodies, road carriers, reloading mechanisms for working with NJ KD at combined transport terminals and their loading / unloading points. The amount of the subsidy was determined from their acquisition price by a share of 30 - 50%. The condition for granting the subsidy was to prove the price of procured funds, to block the agreed amount of money, to conclude an insurance contract for property, to use min. 5 years for KD and conclusion of Contract with MDPT SR. The program of special-purpose subsidies from the state budget began to be implemented as of 1 January 2003. The instrument was canceled by the combined transport development scheme on 23.3.2004,
- An update of the concept of combined transport development was adopted at the meeting of the management of the Ministry on 15 July 2003,
- Resolution of the Government of the Slovak Republic No. 215/2004 approved the use of the Combined Transport Development Scheme in the Slovak Republic in the provision of state aid under the Program for the Support of Combined Transport Development in the Slovak Republic. The scheme of combined transport development in the SR was published in the Commercial Bulletin no. 57/2004 on 23.3.2004. The scheme was canceled on 15.6.2007,
- Ministry of Transport, Posts and Telecommunications of the Slovak Republic pursuant to § 8 par. 2 of Act no. 523/2004 Coll. on budgetary rules of public administration and on amendments to certain acts, as amended by Act No. 584/2005 Z.z. Decree no. 491 / M-2006 of the Ministry of Transport, Posts and Telecommunications of the Slovak Republic of 15 February 2006 on the provision of subsidies in the field of combined transport,
- Within the EU programming period 2007 - 2013, the Ministry of Transport, Posts and Telecommunications of the SR prepared the Operational Program Transport (OPD), which was approved by the Government Resolution no. 1007 of 6 December 2006. This Operational Program ensured the absorption of funds for transport projects in 2007-2013 from the Cohesion Fund and the European Regional Development Fund. The starting document of the Slovak Republic for the development of OPT was “Transport Policy of the Slovak Republic until 2015”, which was approved by the Government Resolution no. 445/2005. Other documents and their strategies defining the priorities and objectives of the transport policy were also taken into account in the development of OPT. In fulfilling all priorities and objectives through OPT, the global objective of OPT was respected, which was to support sustainable mobility through the development of transport infrastructure and the development of public passenger transport. The specific objectives of OPT were modernization and development of railway infrastructure, modernization and development of road infrastructure, modernization and development of intermodal transport infrastructure and development of public passenger transport. In the framework of Priority Axis 3 - Intermodal transport infrastructure, the intermodal terminal Žilina - Teplička was built

3.3.4. Operational Program 2021-2027

The process of proposing priorities under the new programming period is ongoing, so it is not yet clear the precise focus and allocation of financial resources in the new period. Regarding rail transport, the aim is to continue the modernization of the corridor on the Žilina - Košice line. Regarding ŽSK, this activity will mainly affect the section Vrútky - the border of the Prešov region, as the section Varín - Vrútky was reconstructed a few years ago and reaches the required technical parameters. Čadca - Čadca state border section will be modernized from other funds, specifically foreseen funding from CEF (currently preparing an application for a non-repayable financial contribution).

3.3.5. Capacity allocation for international trains

Capacity allocation has its sequence of steps to efficiently use infrastructure with non-discriminatory access to individual carriers.

Ways of applying for international train paths:

1. Train routes to the new GVD and to the change of the valid GVD may be ordered via the European Electronic Network Coordination System (RNE PCS) in writing (by e-mail).
2. To be ordered ad-hoc:
    - through the European coordination system RNE PCS,
    - for trains without special timetable via IS PIS (Operational Information System) (OSS Ordering Application),
    - for trains with special timetable by PIS VDS PT (PIS path planning),
    - The general principles apply when approving the allocation of a train path:
    - International routes must be harmonized and agreed by all infrastructure managers and train applicants. If international routes are not harmonized and agreed, these routes are considered materially incorrect and will not be implemented within the framework of the GVD.
    - In the event of changes in international routes, a new harmonization of the route is again necessary.
    - The applicant must activate this route through the 'Simplified Order' application (IS PIS) in the case of a 'train on demand' journey. Any changes to the activation date and parameters must be agreed by all stakeholders.
    - If the applicant to whom the train path has been assigned does not have a valid / concluded LRU (Access to Railway Infrastructure) Agreement with the relevant Infrastructure Manager, he / she is required to notify the Railway Undertaking in writing before driving within 30 days. LO Agreement) through which to use this train route.

- If the application for the allocation of the train path does not have all the requisites, the application will be rejected by the MI in writing (by e-mail). If the applicant modifies the application so that it complies with the prescribed particulars and is factually legal, then the application shall be deemed to have been duly submitted.

The application for the allocation of the infrastructure capacity to be incorporated into the GVD shall be submitted by the applicant according to the deadlines set out in the following table.

Table 2 - Deadlines for submitting applications for infrastructure capacity to GVD

GVD for year 2020/2021			
	Name of the activity	Deadlines	Responsible
Requirements for GVD in time	Order of train paths	Second decade of April 2020	ŽP
	Processing and issuance of the CP proposal in passenger transport	Second decade of May 2020	ŽSR
	Issuance of interstate securities in passenger transport	Second decade of May 2020	ŽSR
	Issue of draft CP in freight transport	June 2020	ŽSR
	Comments from railway undertakings in the ND	By the end of the first decade of July 2020	ŽP
	Comments from railway undertakings in OD	By the end of the first decade of July 2020	ŽP
Delayed requirements	Receiving applications	Day after deadline for ordering train paths - April 2020	ŽP
	End of application receipt	By October 2020	ŽP
Start of validity GVD		13.12.2020	
End of validity GVD		XX.12.2021	

Planned changes to the current / valid GVD can be made for train paths ad-hoc:

- Not later than 30 days before the train departs from the starting point for the Rail Freight Corridors (RFC) routes. ŽSR may apply an exception for individual RFCs, which will subsequently be published on the individual RFC's website.
- Not later than 6 hours before the train leaves the initial station for pre-engineered routes and routes that can be assembled from pre-engineered routes.
- The change may be made no later than 5 working days before the scheduled departure of the train from the starting station for train paths requiring the design of a separate timetable, for train test runs and TBS (Technical safety test))
- Not later than 3 working days before the day of the scheduled journey to / from the service, excluding the transport service.

Change of assigned path parameters (emergency stop of passenger trains):

- The change may be made no later than 3/6 hours before the scheduled departure time of the train from the starting station. (eg empty wagons without passengers, power wagons).

- The change may be made no later than 3/6 hours before the scheduled departure time of the train from the starting station. (eg empty wagons without passengers, power wagons.

Validity of ordered train paths:

- A train that has not made a scheduled departure on the railway network under the management of ŽSR within 24h, and at the same time the RU did not request the cancellation of the train from the starting point of transport is automatically canceled in the PIS system.
- In case the train is stationary at a crossing point for more than 48 hours, the PIS automatically terminates it. The train may be parked at a crossing point.

4. MAIN RAILWAY LINES IN THE EGTC TRITIA

4.1. Czech republic

4.1.1. Historical context

Railway in the Moravian-Silesian Region has a long tradition. Already in the first half of the 19th century, the line "Northern Railway of Emperor Ferdinand" was established from Vienna to Bohumín. This track was used from the beginning to transport goods between industrial centers in Central Europe. Gradually, further connections of international and regional importance emerged.
The construction of railway corridors was considered in the 1990s as a priority action of the transport policy of the Czech Republic. Efforts have been made to improve decades of unsustainable rail transport on the main routes to a modern, time and cost-competitive way of driving. Within the construction of corridors there are two types of construction:

- modernization, ie major reconstruction of the line including a change in its routing in the field,
- Optimization, ie rebuilding without changing track routing in the field.

At the beginning of the 21st century, delays in the construction of corridors began to increase, initially planned costs increased, and construction priorities were gradually shifted to motorway constructions in which an increasing share of SFDI was invested. Efforts to save money have resulted in several originally planned upgrades turned into locations with more rugged terrain to optimize in terms of time and money, some projects have not been realized to date and some are due to poor design or execution planned for rebuilding.

4.1.2. Present state and perspective

TŽK
Abreviation TŽK (Transit Railway Corridor) stands for the main, modernized 19th-century railway line with a maximum speed of 160 km / h intended primarily for suburban, long-distance and transit passenger and freight transport.

Two European corridors cross the monitored territory of TRITIA:

II. transit corridor : Petrovice u Karviné state border – Ostrava main station – Přerov – Břeclav state border, which started to be built in September 1997, was completed in June 2004 excluding sections in Ostrava.

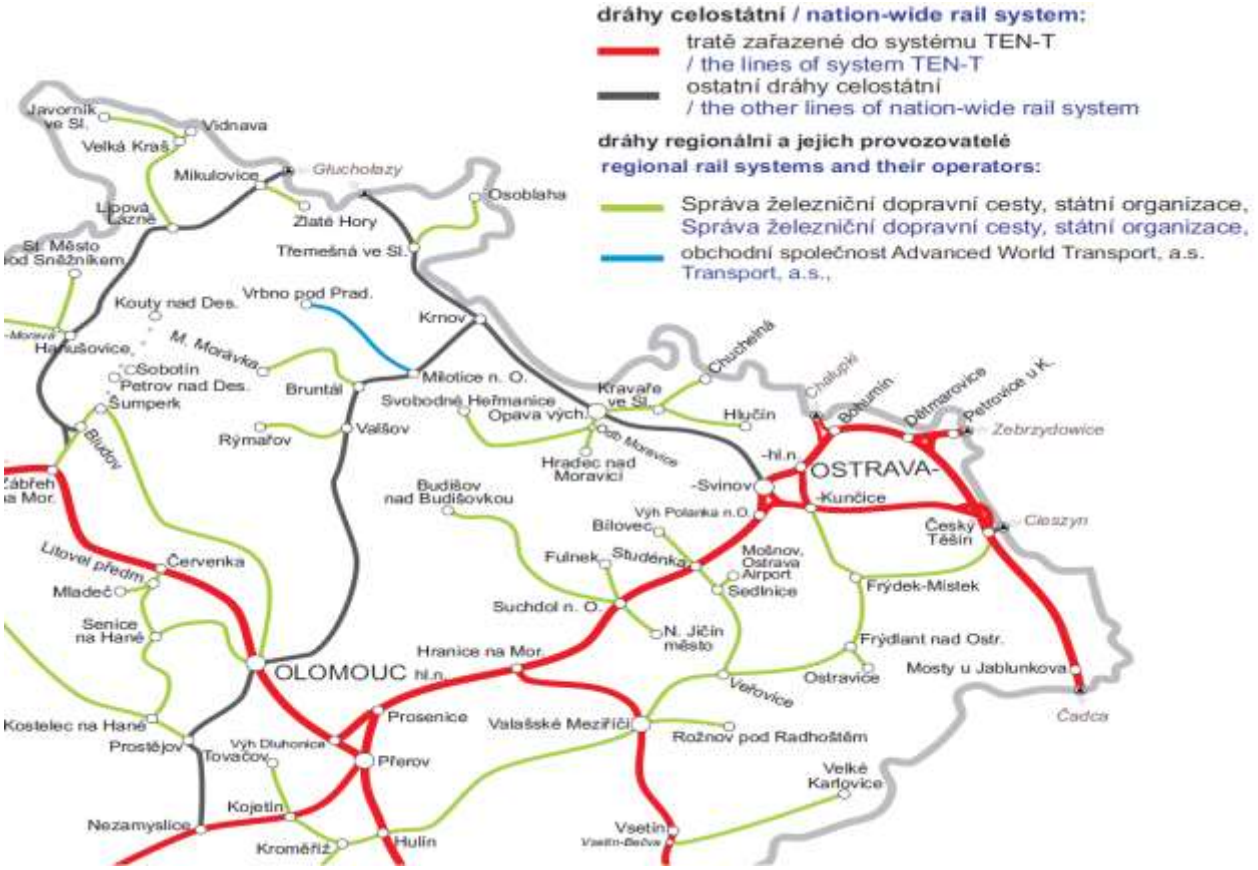
III. transit corridor : Mosty u Jablunkova state border - Ostrava Main Station - Přerov - Prague - Pilsen - Cheb state border have been completed except for concurrence with other corridors and undermined sections

In the Czech Republic, most speed rail corridors are built or planned for the following parameters:

- electrified 1-3 track line,
- modern electronic line signaling equipment with automatic block, enabling the use of remote traffic control, newly transferred to ETCS,
- maximum line speed of 160 km / h (cannot be reached over the entire length),
- Peronized stations with elevated gradients,
- minimum number of level crossings with roads (level crossings).

Meeting or approaching these parameters requires many track relocations - widening the radii of directional (and height) curves or new tunnels.
Large railway junctions are not included in the corridor construction. Their costly rebuilding is being prepared and implemented separately with a time delay.
Although the corridors in some sections did not allow for a significant increase in the speed of transport, they improved the construction condition of the lines, increased the number of noise barriers and in some cases contributed to increasing the capacity and safety of the lines. In addition, thanks to the operation of the tilting units of the 680 series (Pendolino), it is possible to increase the line speed even in slower sections with smaller radii of curves, so in the current timetable the travel time between Prague and Ostrava is 2 hours and 53 minutes. (By comparison, the travel time of the express bus Prague-Ostrava 5 hours and 30 minutes.)
As part of the completion of the individual parts of the corridors, other constructions are also planned, such as the “Modernization of the Ostrava Railway Junction” and others.

Figure 5 – Railway lines of the Moravian Silesian region by importance



4.2. Poland

4.2.1. Historical context

Historical conditions of selected railway lines:

Cieszyn - Czech Cieszyn

Railway line No. 190 Bielsko-Biała Główna - Cieszyn - railway line in the southern part of the Śląskie Voivodeship. The entire length of the line is single track and electrified. The railway line was opened on June 1, 1888 as part of the Austrian Railway of Silesian and Galician Towns. After the division of Cieszyn Silesia between Poland and Czechoslovakia, a border post was created on the Olza railway bridge in Cieszyn. The former Austrian railway was divided into Polish and Czechoslovakian lines, then the Bielsko-Biała - Cieszyn railway line was created. After World War II, passenger train traffic was restored on October 19, 1945. The electrification of the Skoczów - Goleszów section was completed on December 23, 1974, the Bielsko-Biała Główna - Skoczów section on December 29, 1982, although elective traction courses were not introduced until February 1, 1983. The section from the Goleszów - Cieszyn line was electrified on May 28, 1983. Passenger trains on the section Cieszyn - Český Těšín ran until October 6, 1951. However, the section was electrified in 1994, the inauguration of the Bielsko-Biała - Czech Cieszyn rail connection took place on February 28, 1995. In April 2013, the Śląskie Voivodeship published a document containing a project to revitalize railway line No. 190 on the Skoczów-Goleszów section as part of the Regional Operational Program. In November 2015, the railway revitalization project was extended by an additional section from Goleszów to Cieszyn.

Zebrzydowice - Petrowice

The border crossing point for passenger traffic took place in Petrovice near Karviné and on the section Katowice - Ostrava. On the other hand, freight traffic took place in both border towns. The border crossing was open 24 hours a day. Passenger and freight traffic as well as small border traffic were allowed. It was served by the border control post of the Border Guard in Zebrzydowice. The border crossing was located on the route of railway line No. 93.

On December 21, 2007, the transition was closed under the Schengen Agreement.

During the period of Czechoslovakia, Polish-Czechoslovakian border crossings operated here:

local border traffic Zebrzydowice-Petrovice - I category. It was open every day during the passage of passenger trains. Movement of persons and means of transport on the basis of passes was allowed for all reasons provided for in the Convention. Customs control was carried out by customs authorities.

Zebrzydowice railways. It was open every day around the clock. Passenger and freight traffic were allowed. It was served by the Zebrzydowice border control facility.

Chałupki - Bohumin

The station in Chałupki is an important railway junction connecting two railway lines of national importance: railway line No. 151 and railway line 158 with one of the largest railway junctions in the Czech Republic - Bohumín. This enables a railway connection of a significant part of Poland with the Czech Republic and indirectly also with Slovakia, Hungary and Austria.

The **Rybnik Towarowy - Chałupki** railway line runs through a highly urbanized and densely populated area of Silesia. From the Bohumin station you can quickly get to

Ostrava, which has fast train connections to all major cities of southern and western Europe in passenger traffic, and in freight traffic from Chałupki station the international route E65 guarantees rail connections to the south of Europe (Vienna - Villach) and the Balkans. The problem of this route is solved by the modernization of the 12 km monorail line on the section Wodzisław Śląski - Chałupki, which amounts to about PLN 45 million. In 2008-2009, track 1 was repaired on the Rybnik - Wodzisław Śląski section, as a result of which the speed was increased to 60 km / h. However, due to the lack of financial resources, works were not continued on the further section to the Chałupki station.
The railway line No. 158 starts from the station Rybnik Towarowy in the district of Niedobczyce, where it is a branch of the railway line No. 140. Between stations Rybnik Towarowy and Wodzisław Śląski the line intertwines with lines No. 862, 877 and 876, which connect the above stations via the siding at KWK Marcel. South of the Wodzisław Śląski station, the line runs parallel to the closed lines No. 159 (to Orzesz) and No. 875 (to the siding at KWK 1 Maja). At the Olza station, it connects to the closed line No. 176 to Racibórz Markowice. From the Rudyszwałd stop it runs together with the railway line No. 151 up to the final station Chałupki.
In 1846, the first section of the Wilhelm Railway ((German) Wilhelmsbahn, currently railway line No. 151) connecting Racibórz with Koźle was opened. In Koźle, the line connected with the Upper Silesian Railway ((German) Oberschlesische Eisenbahn) connecting Upper Silesia with Wrocław. In 1847, Wilhelm's Railway was extended to Bohumin [5]. In the years 1855–1858 further sections of the Wilhelm Railway connecting Racibórz with Katowice through Rybnik (currently railway line No. 140) were opened.
On June 30, 2014 PKP PLK signed an agreement with the Center for EU Transport Projects for co-financing the revitalization of line No. 158 together with the section of line No. 140 Rybnik Towarowy - Rybnik under the Cohesion Fund. On July 30, the company signed a second contract with a consortium of Rubau Polska, Construcciones Rubau and Rover Alcisa to carry out the work.
At the end of October 2014, the single-track section of Wodzisław Śląski - Chałupki was closed to traffic and the dismantling of individual elements of the railway infrastructure began on it. From March 15 to October 31, 2015, due to the works at the Wodzisław Śląski station, entry to it was not possible from Rybnik.
As part of the renovation, 30 km of railway lines were revitalized and control room buildings were renovated. As a result of the renovation, the maximum speed on the line increased to 80 km/h. The track system of the Wodzisław Śląski station (6 of 14 tracks were renovated) and Olza station (3 of 6 tracks were renovated) were rebuilt. On January 8, 2016, the section Wodzisław Śląski - Chałupki was put into service [. In July, the renovation of tracks No. 4 and 6 at the Wodzisław Śląski station and No. 2 and 4 at the Olza station began under the program "Improving safety and eliminating operational hazards on the railway network".
On June 7, 2018, the presidents of Rybnik and Wodzisław Śląski and the marshal of the Śląskie Voivodeship signed an agreement regarding the increase in the frequency of connections on the Rybnik - Wodzisław Śląski section for 4.5 years. On June 10 the number of passenger connections on the Rybnik - Wodzisław section increased from 9 to 27 pairs.

Zwardoń - Skalité

The railway network of the Polish - Slovak part of the Beskids region consists of lines 126, 127 and 129. The most important is route 127 ((Žilina - Čadca - Mosty u Jablůnkova) which together with route 129 (Čadca - Skalité) forms part of the Gdańsk - Warsaw - Brno / Bratislava - Vienna railway route.

The largest investment in Poland was the investment in railway line 139 on the Milówka - Zwardoń section.
The first section of this railway line, from Katowice to Ligota, was opened on December 1, 1852. It then became part of the railway lines managed by Górnośląska Railway. The section from Dziedzice to Bielsko was opened on December 17, 1855 as part of the Northern Railway. On November 15, 1868, the section from Tychy to Dziedzice was opened, on August 18, 1878, the Bielsko - Żywiec section, and on November 3, 1884, the Żywiec - Zwardoń section. The youngest part of the railway line is the Katowice Ligota - Tychy section, which was opened on November 2, 1912. In 1963, the railway line was rebuilt to the double-track line on the Katowice - Bielsko-Biała Główna section, and in 1990 the Bielsko-Biała Lipnik - Wilkowice Bystra section. In 1961 the Katowice - Katowice Ligota section was electrified, in 1963 the Katowice Ligota - Bielsko-Biała Główna section was electrified, then in 1970 the section from Bielsko-Biała Główna station to Żywiec station was electrified, and in 1986 the section Żywiec - Zwardoń. The last section to be electrified in 2002 was the Zwardoń - Skalité-Serafínov section.
In December 2007, long-distance trains were suspended on the Bielsko-Biała - Zwardoń section. On June 6 2017, PKP Polskie Linie Kolejowe signed a contract with the consortium of Intop Warsaw and Przedsiębiorstwo Remontowo Budowlane "Tor" for the revitalization of route No. 139 on the Bielsko-Biała Lipnik - Wilkowice Bystra section. On June 11, 2017, long distance trains were restored on the Bielsko-Biała - Zwardoń section. On May 29, 2018, PKP Polskie Linie Kolejowe signed a contract with CTL Service for the revitalization of the Żywiec - Węgierska Górka section. The contract includes, among others: reconstruction of platforms at Radziechowy Wieprz, Cięcina Dolna and Cięcina stops, replacement of pavement on 10 rail-road crossings, replacement of approx. 8 km of tracks and 9 km of overhead contact line and renovation of 21 engineering facilities (including 7 bridges).

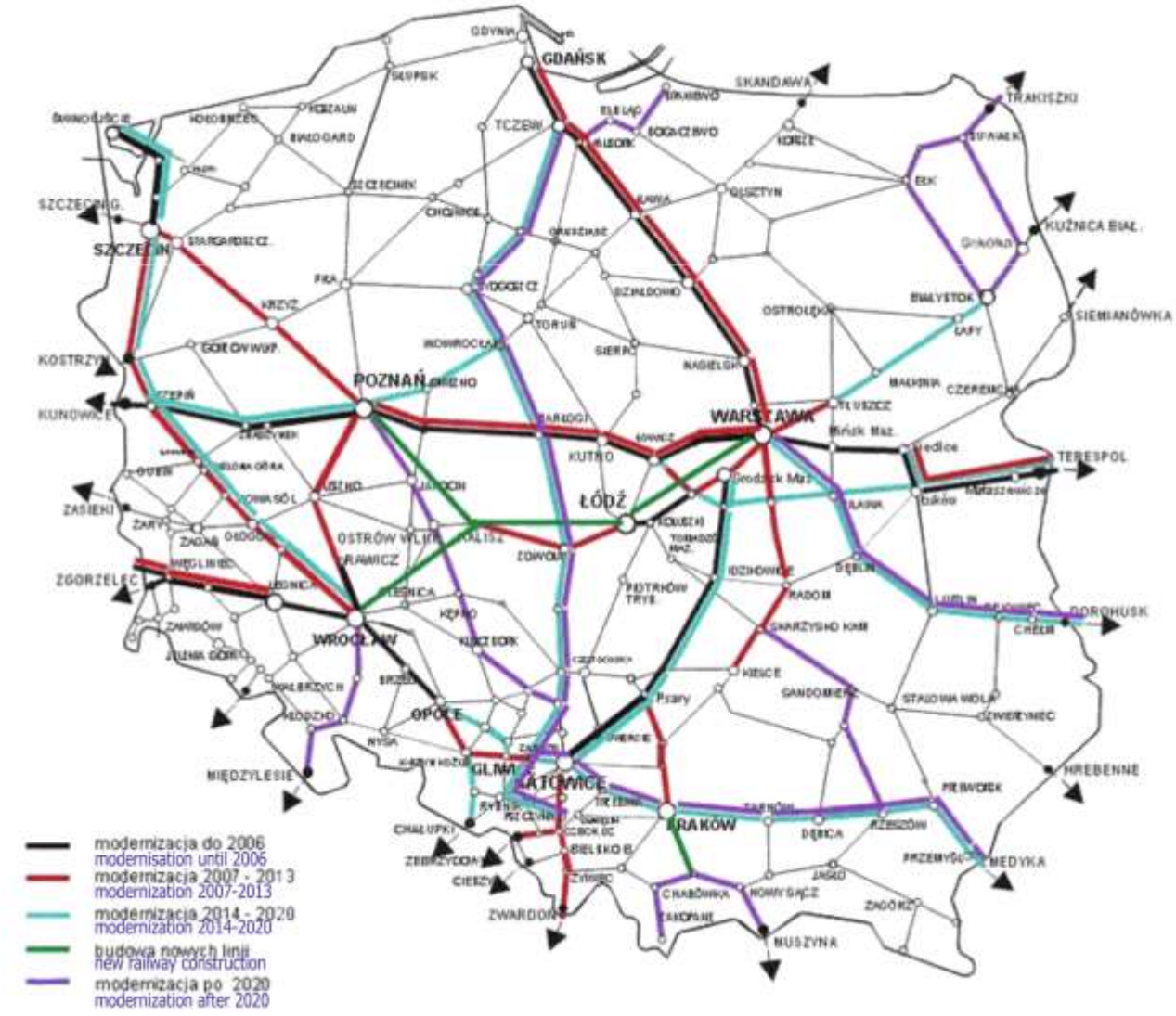
4.2.2. Present state and perspective

Most freight trains that run in international relations from Poland cross the Polish-Czech border. Such information is provided by the Office of Rail Transport. Data provided by the Office relate to information from carriers collected for 2018, exclusively from Polish carriers. They show that by far the largest movement of freight trains takes place via the Zebrzydowice - Petrovice rail border crossing. Last year, 14,000 414 trains passed through them. The second in terms of transport is the neighboring Chałupki - Bohumin crossing, where 12,000 288 freight trains launched by domestic cargo carriers have been cleared in both directions. It is worth noting that the railway line on the Polish and Czech border is electrified in both cases, there is no need to change the traction on them (the same voltage on both sides of the border), and trains can be run here at a speed of 90 to 120 kilometers per hour.

Strategic projects in the field of rail transport
National Railway Program - providing connection by 2023 of voivodeship centers with modernized railway lines, at least up to the average speed of 100 km / h passenger trains, and the implementation of the European Rail Traffic Management System (ERTMS) on the most important railway routes.
The multi-annual program - in the scope of financing the costs of managing railway infrastructure, including its maintenance and renovation - contributing to the improvement of transport accessibility and communication coherence of individual regions of the country.

Modernization of the rolling stock park (passenger and freight) - improving the conditions for the provision of services related to the transport of goods and passengers.
Development of intermodal transport - definition of activities, including necessary investments in transport infrastructure, ensuring increase in intermodal transport.
In 2016-2023, it is planned to increase expenditure on the development and modernization of railway infrastructure to PLN 31 billion - of which PLN 22 billion will come from EU funds.
PKP PLK assumes the continuation of modernization and revitalization of the existing railway network, including high-speed rail between major cities. The assumed travel speeds are 160 km/h for passenger connections, and 120 km/h for freight connections.

Figure 6 - Map of railway infrastructure in Poland



Source: PKP, 2016

According to data from the Office of Rail Transport, the total mass of goods transported in 2017 was 17.6 million tons higher than in 2016 (an increase of 7.9% y / y). The increase occurred in all segments of transported goods, except for solid fuels.
The mass of freight transported in intermodal transport in 2017 increased by almost 15% (1.9 million tons) and amounted to 14.7 million tons.
Most freight trains that run in international relations from Poland cross the Polish-Czech border. Such information is provided by the Office of Rail Transport. Statistics of passenger trains between countries also look good.
Data provided by the Office relate to information from carriers collected for 2018, exclusively from Polish carriers. They show that by far the largest movement of freight trains takes place via the Zebrzydowice - Petrovice rail border crossing. Last year, 14,000 414 trains passed through them. The second in terms of transport is the neighboring Chałupki - Bohumin crossing, where 12,000 288 freight trains launched by domestic cargo carriers have been cleared in both directions. It is worth noting that the railway line on the Polish and Czech border is electrified in both cases, there is no need to change the traction on them (the same voltage on both sides of the border), and trains can be run here at a speed of 90 to 120 kilometers per hour.
5 pairs of passanger train a day run by PKP Intercity together with foreign partners cross the border Zebrzydowice - Petrovice in the summer season. But already through the neighboring, Chałupki - Bohumin, as many as 11 pairs, including trains of Silesian Railways. There is also considerable traffic in other places on the Polish-Czech border, e.g. between Szklarska Poręba and Harrachov (9 pairs of trains) or between Cieszyn and Český Těšín (9 pairs of Czech Railways trains to and from Frydek Mistek). Four pairs of passenger trains cross the Głuchołazy - Albrechtice border crossing per day.

Table 3 - Characteristics of TRITIA cross-border traffic sections - rail (Poland-Czech Republic)

Cross-border	Technical and operational data	PLK	SŽDC
Chałupki - Bohumin	Technical speed	90 km/h	100km/h
	Braking distance	1000m	
	Decisive longitudinal slope	7	
	Max. Length of passenger / freight trains	400m/650m	
	Max axle load	221kN(22,5t	
	Max axle load on running meters	78kN/mb (8t/mb)	
	Track class	D4	
	Rolling stock gauge	PN-70/K-02056	
	Traction network	3kV	

Cross-border	Technical and operational data	PLK	SŽDC
Zebrzydowice – Petrowice u Karvine	Technical speed	120km/h	
	Braking distance	1000m	
	Decisive longitudinal slope	4,0	
	Max. Length of passenger / freight trains	400m/650m	
	Max axle load	221kN(22,5t	
	Max axle load on running	71kN/mb (7,2t/mb)	

	meters	
	Track class	D4
	Rolling stock gauge	PN-70/K-02056
	Traction network	3kV

Cross-border	Technical and operational data	PLK	SŽDC
Cieszyn – Český Těšín	Technical speed	40 km/h	
	Braking distance	400m	
	Decisive longitudinal slope	8	
	Max. Length of passenger / freight trains	120m/220m	
	Max axle load	196kN(20,0t)	
	Max axle load on running meters	71kN/mb (7,2t/mb)	
	Track class	C3	
	Rolling stock gauge	PN-70/K-02056	
	Traction network	3kV	

Cross-border	Technical and operational data	PLK	SŽDC
Głuchołazy – Jindřichov ve Slezsku	Technical speed	40 km/h	60km/h
	Braking distance	700m	
	Decisive longitudinal slope	11	
	Max. Length of passenger / freight trains	118m/390m	
	Max axle load	196kN(20t)	
	Max axle load on running meters	71kN/mb (7,2t/mb)	
	Track class	C3	
	Rolling stock gauge	PN-70/K-02056	
	Traction network	Linia niezelektryfikowana	

Cross-border	Technical and operational data	PLK	SŽDC
Zebrzydowice – Český Těšín	Technical speed	40 km/h	
	Braking distance	400m	
	Decisive longitudinal slope	8	
	Max. Length of passenger / freight trains	120m/600m	
	Max axle load	196kN(20t)	
	Max axle load on running meters	18kN/mb (7,2t/mb)	
	Track class	C3	
	Rolling stock gauge	PN-70/K-02056	
	Traction network	3kV	

For local railway crossings between the Republic of Poland and the Czech Republic, new Local Border Agreements are in force, concluded on the basis of the "Cooperation Agreement in the field of railway infrastructure management for running rail traffic across the state border between the Republic of Poland and the Czech Republic".

Table 4 - Characteristics of TRITIA cross-border traffic sections - rail (Poland-Slovakia)

Cross-border	Technical and operational data	PLK	ŽSR
Zwardoń - Skalité	Technical speed	70 km/h	
	Braking distance	700m	
	Decisive longitudinal slope	26	
	Max. Length of passenger / freight trains	150m/350m	
	Max axle load	221kN(22,5t	
	Max axle load on running meters	78kN/mb (8t/mb)	
	Track class	D4	
	Rolling stock gauge	PN-70/K-02056	
	Traction network	3kV	

Notice: Cross-border Suchá Hora is not long time operated with no prediction of revitalization – see 4.3.1.

For the above railway crossings between the Republic of Poland and the Slovak Republic, new Local Border Agreements are in force, concluded on the basis of the "Cooperation Agreement in the field of railway infrastructure management for running rail traffic across the state border between the Republic of Poland and the Slovak Republic".

4.3. Slovakia

Since its inception, railway transport has had an important position in the territory of the Slovak Republic and at present it serves primarily for the transport of bulk substrates, which is not economically advantageous to transport by road. At present, intermodal transport is developing significantly, supporting the primary development of large enterprises and creating simple logistics chains that can be modified according to the current situation and create conditions for growth in the global market.

4.3.1. Historical context

All significant lines in Slovakia were built in the 19th century, when there was a significant industrialization of the area, which was related to the industrial revolution and increasing requirements for the transport of goods. The lines within ŽSK were opened as follows:

- In 1871 the line Český Těšín – Žilina, Žilina – Poprad;
- In 1873 the line Trenčín – Žilina a Zvolen – Vrútky (via Kremnica);
- In 1884 the line Čadca – Zwardoń (cross-border abolished after World War II)
- In 1898 the line trať Kraľovany – Oravský Podzámok;
- In 1899 the line trať Oravský Podzámok – Tvrdošín;
- In 1899 the line trať Tvrdošín – Suchá Hora (abolished in 1970);

- In 1899 the line traťŽilina – Rajec;
- In 1904 connection of Suchá Hora with Nový Targ (abolished after World War II);
- In 1914 the line Čadca – Makov;
- In 1991 the line connection Čadca – Zwardoń with full operation since 1992.

Increasing capacity on the main lines required an increase in capacity, which was achieved by doubling the main lines. This process was gradually realized at the beginning of the 20th century and included the section Trenčín - Žilina, Čadca - Žilina - Vrútky - Poprad. After the Second World War there was a significant increase in the performance of freight transport based on the construction of heavy industry in the territory of Czechoslovakia and increased trade with the Soviet Union. In view of this fact, there was a need to electrify the main lines in order to ensure an efficient transport mode for heavy freight trains and to improve the economic indicators of passenger trains that ensure the interconnection of important settlements throughout Slovakia.
Doubletracking of individual sections:

- In 1898 the line Čadca – Čadca cross-border;
- In 1911 the line Žilina – Púchov;
- In 1915 the line Žilina – Čadca;
- In 1938 the line Vrútky – Horná Štubňa;
- In 1950 the line Spišská Nová Ves – Žilina.

Electrification of individual sections:

- In 1956 the line Spišská Nová Ves – Žilina;
- In 1960 the line Žilina – Púchov;
- In 1963 the line Čadca – Čadca cross-border;
- In 1964 the line Žilina – Čadca;
- In 1982 the line Vrútky – Martin;
- In 2002 the line Čadca – Skalité.

Electrification is also related to the restoration of transformer stations, which took place throughout Czechoslovakia between 1970 and 1978. This initiative was based on previous changes to the line interlocking equipment, which caused the subsequent intermediate period to be shorter than the electrical one and to replace the technological part of the power, which was a limiting factor in the train sequence driven by electric locomotives. The electric split was a limiting factor mainly in the case of freight trains, which weigh heavily on the line changers and create more significant fluctuations in the network compared to passenger trains.
Before 1989, it was envisaged to build new lines on the Varín - Vrútky section, due to the fact that the utilization in this section was at a critical level and could no longer provide additional capacity for the allocation of further train paths. After the disintegration of the RVHP unit, there was a significant decrease in performance on the entire network and there was no longer any need to address the increase in capacity in the affected section.

4.3.2. Present state and perspective

At present, the railway network on the territory of ŽSK has sufficient capacity to meet the demand for rail transport. In the near future, a gradual increase in passenger and freight transport is expected, due to the increasing number of routes of carriers performing transport at their own risk (primarily the Bratislava - Žilina line) without state contribution. Rail transport is also expected to grow at the regional level, especially in the Žilina - Rajec section, which will be one of the first sections to be operated by a haulier selected from

public procurement, with infrastructure interventions envisaged to increase the current capacity that currently allows traffic. one pair of trains per hour. Developments on the line concerned may also have a slight impact on the main lines, as better connections from the region to the national rail network will be ensured. In terms of freight transport, the development of intermodal transport through a public terminal, which started operations at the beginning of 2019, may be an important growth factor.

Figure 7 – Railway lines in Žilina region

The table on the next page lists all major projects that are in preparation for improving the quality of the main lines in the Žilina self-governing region. All projects envisage co-financing from EU funds, given the scale of the modernization being prepared. The implementation of pirated projects will also change the power system with the current 3kV DC to 25kV AC, which will ensure better compatibility within the railway infrastructure on the European continent. As part of the upgrade, all interlocking equipment will be replaced and upgraded to ETCS level 2 to ensure the compatibility of locomotives when moving between countries.

Table 5 - List of planned projects on the railway infrastructure in the Žilina region

Proj.	Project name	Location	Project type	Planned timeframe of the project (construction)
1.	Žilina node	Town Žilina with surrounding area	Infrastructural, modernization with new line security (ETCS 2 with GSMR)) and transition to 25kV electrification	2019 – 2021
2.	Krásno nad Kysucou – Čadca (border), section Čadca – Krásno nad Kysucou	Čadca region	Modernization of infrastructure, line security and transition to 25kV electrification	2022 – 2025 (approx.)
3.	Poprad – Východná	Poprad and Liptov region	Modernization of infrastructure, line security and transition to 25kV electrification	2025 - 2028
4.	Východná – Liptovský Hrádok	Liptov region	Modernization of infrastructure, line security and transition to 25kV electrification	2024 - 2026
5.	Liptovský Hrádok – Liptovský Mikuláš	Liptov region	Modernization of infrastructure, line security and transition to 25kV electrification	2020 - 2023
6.	Liptovský Mikuláš – Ružomberok	Liptov region	Modernization of infrastructure, line security and transition to 25kV electrification	2024 - 2025
7.	Ružomberok – Turany	Liptov and Turiec region	Modernization of infrastructure, line security and transition to 25kV electrification	2026 - 2029
8.	Turany – Vrútky	Turiec region	Modernization of infrastructure, line security and transition to 25kV electrification	2024 - 2025
9.	Vrútky – Varín	Turiec and Žilina region	Modernization of infrastructure, line security and transition to 25kV electrification	2026 - 2028

Within the framework of railway transport, from the point of view of the long-term development of railway transport, a situation may arise where it will be advantageous to renew the railway connection between Tvrdošín and Nowy Targ. The main reason may be that there are currently three border crossings between Skalit, Plaveč and Medzilaborce between Poland and Slovakia. This situation may, in the future, limit the development of rail transport focusing on the North-South interconnection, given the development of ports in the Mediterranean and northern Poland.

5. CHARACTERISTICS OF RAIL TRANSPORT

Railway transport has its specifics related to transport infrastructure (its equipment - type of signaling equipment in stations and lines, number of lines, number and length of lines in stations, electrification or non-electrification of line sections, state of superstructure and bottom affecting speed etc. and traffic management. Also, the transitability of traction units to certain lines is limited due to lack of electrification or the type of power supply to the traction power system. Specific traffic and signaling regulations apply to traffic management.
It is controlled in the individual track sections between the TZZ stations along the whole track and at the SZZ stations. This affects the permeability of the tracks ie. how many trains are able to pass the sections in a certain period of time. During the day, peak hours of traffic are alternating in operation, with the most traffic on the lines and saddles when the range of traffic is the lowest. Limited throughput has an impact on downtime eg loads. of trains at the stations. The size of the net is much smaller than that of roads and for this reason it is not possible to bypass excessively busy sections. There are many more elements that affect traffic and can fail than on the road. Due to the large extent of closures due to track reconstruction, there are often delays that cannot be predicted and estimated. Long and heavy trains are transported (when loaded with wagons), which have a long stopping distance and will cause far more damage in the event of an accident than on the road.
However, it is an environmentally friendly mode of transport - as far as electrified lines are concerned. Old diesel locomotives are less ecological.
Abreviations:
TZZ - line signaling equipment SZZ - station signaling equipment (in railway stations)

5.1. Transportation costs

Comparison of costs between modes of transport:

Table 6 - The cost of transporting containers

containers (TEU) 20 t		
	€/1 000 tkm	% of the highest price
road transport	82,2	100,0%
rail transport	46,0	56,0%
inland navigation	33,6	40,9%

Source: Feasibility study of the DOL connection, own processing

Table 7 – The cost of transporting bulk goods

bulk goods		
	€/1 000 tkm	% of the highest price
road transport	47,3	59,6%
rail transport	79,4	100,0%
inland navigation	29,7	37,4%

Source: Feasibility study of the DOL connection, own processing

Table 8 – The cost of transporting tank goods

tank goods		
	€/1 000 tkm	% of the highest price
road transport	89,4	94,3%
rail transport	94,8	100,0%
inland navigation	34,0	35,9%

Source: Feasibility study of the DOL connection, own processing

Table 9 – The cost of transporting heavy and bulky goods

heavy and bulky goods		
	€/1 000 tkm	% of the highest price
road transport	393,8	100,0%
rail transport	neřešeno	neřešeno
inland navigation	78,6	20,0%

Source: Feasibility study of the DOL connection, own processing

Price for transport route by rail

It is described in more detail in the Declaration on the Regional and National Railway Infrastructure (based on Directive 2001/14 / EC of 26 February 2001 on the allocation of railway infrastructure capacity and the charging of railway infrastructure)

The current tariffs for the journey are set to depend on the weight of the train, which motivates the carrier to produce more shorter trains. In view of the infrastructure requirements where the operation of trains up to 740 m in length is required, it would be advisable to adjust the schedule so that it would be advantageous for carriers to create such long trains.

Contractual prices are used for most rail transports. Only about 10% of the goods transport is calculated according to the tariff. For commodities of coal and petrochemical products, mostly contractual prices are negotiated. There is a lot of competition in coal transport, and so it is snowing to push prices down.

Forwarding companies offer customers discounts according to the volume of orders. Large businesses can provide discounts and therefore mostly use contract prices. Many rail freight companies calculate the resulting price separately for each business case, including all parameters and costs. costs of transport route, according to the volume of goods - number and type of wagons, costs of renting special wagons, train weight, locomotive and driver's wage costs, traction (fuel), wages of other employees involved in transport, costs of train processing stations (in the case of a complete train, the costs are minimal), for foreign transport - costs of transport route and commissions of KD operators and remuneration for foreign carriers (who are involved in transport in sections of the line in individual states), transhipment, collection and distribution costs containers, port charges, customs duties, etc.

As far as the sidings are concerned, there is also a "siding", ie the costs of operating siding for smaller companies, who do not pay to have their own shunting locomotive and the driver is high. They must use services such as ČD Cargo, a.s.

Cost structure of railway transport companies:

AWT, a.s. (now PKP International, a.s.)
cost of transport route - 20%
traction unit costs - old locomotives - 10%,
- new electric locomotives - 20 -25%
fuel costs - for diesel locomotives - 30%,
- for electric locomotives - 20%
wage costs - 20% (operating and administrative staff)
or even less, if we take into account the overhead item
overhead - 10%
reasonable profit - about 5%

Note:
The purchase price of the new electric locomotive is CZK 80-100 million. The operation of a new electric locomotive costs CZK 40,000 per day.
The locomotives must be inspected according to operating regulations. eg train protection. Completion of ETCS CZK 11 million.
Because AWT, as also carries out foreign transports through Germany - they come for inspection from Germany and charge 100,000 CZK for one inspection. Such checks must be carried out at specified intervals (eg every year).

Vítkovice Transport, a.s:
cost of transport route - 5%
traction unit costs - 20%
diesel fuel costs - 30%
wage costs - 20%
the cost of hiring foreign iron. cars - 10%
overhead - 5%
reasonable profit - 10%

The highest share in the total costs of a transport company doing business in rail freight transport is the cost of fuel, about 20 - 30%. Furthermore, the cost of traction vehicles is 20 -25%. It also depends on the size of the fleet - the number of locomotives and their age, ie. older vehicles have higher maintenance and repair costs. This is followed by the wage costs of employees with a share of about 20%.
Generally, it depends on the size of the company and the size of the fleet (locomotives, wagons), which is also related to the size of the transport capacity it can realize. An important role is played by the price of fuels (electricity or diesel), which is also constantly changing according to the development of the economy. The larger the company and the larger volumes it carries, the more it can provide in terms of contractual shipping costs because it has more profits.
Rail transport is financially worthwhile for larger volumes of goods, for long-distance international transport following maritime transport, ie the transport of containers from seaports to inland Europe (to different countries) or between KD terminals in different countries.
The calculation of the transport price also depends on the type of transport units, whether they are only railway wagons or even containers or road trailers. For a particular transport,

companies make preliminary shipping cost calculations to see if they pay off. Comprehensive trains that consist of one type of wagon and regularly transport a certain type of goods between two places located in other states (shuttle trains) are more cost-effective, as they do not need to be reworked at marshalling yards during transport). In one direction the load runs in the empty and in the other way the customer pays both ways.
Within the Czech Republic, the railway does not have a sufficient number of modern wagons for pallet goods and also modern warehouses connected to rails and fast systems of reloading between rail and road. E.g. there are many more such warehouses in Germany.
The statistics of the Ministry of Transport on transport by type of goods show that the transport of coal, coke, chemicals (petroleum products, other chemicals), metallurgical products, iron products, larger engineering products (generators, shafts), agricultural products (grain, sugar, rape), larger building components (eg concrete), means of transport (cars, trams, military equipment, etc.), wood, etc. These are mainly bulk substrates and very heavy products that cannot be transported by road because trucks would be overloaded and would damage the roads.

However, in the case of transporting smaller quantities of goods, the customer decides to transport by road or rail primarily according to the price, quality of services offered (ie min. Probability of damage to goods during transport), speed of transport, etc.

In addition, congestion of major domestic corridors, shorter train lengths and one traction system, coupled with relatively high infrastructure charges, mean that foreign freight rail carriers are increasingly using routes from north-west Europe to south-east and an alternative longer route through Austria. Thus, the Railway Infrastructure Administration (SŽDC) partially escapes revenues from the railway route and Czech railway carriers take over the transport of foreign carriers.
The problem was raised by the association of railway freight carriers ŽESNAD. The Hamburg - Budapest route is 151 km longer than the Czech Republic through Passau, but it is still very much used, because it is more reliable, cheaper and of a longer train length. It's all about efficiency.
According to him, the journey will be cheaper through Germany and Austria, especially for long, compact trains for several reasons. One of them is the rate for using the transport route: one train kilometer for a train weighing 1800 tons will cost 4.31 euros in Austria and 28 cents in the Czech Republic. During the whole journey from Germany to Hungary longer trains can go. This means that they can harness one to two more wagons per locomotive, spreading unit costs.
The operation itself is also cheaper - through Austria, the whole road is under alternating voltage, in the Czech Republic partly under DC voltage. They can use cheaper two-system locomotives compared to three- or two-engine locomotives. In addition, the losses in alternating traction are lower.
Another factor is not included in the statistics: poor permeability of Czech corridors. Due to heavy passenger traffic, trains often have to stand for hours before getting on the track instead. While they usually drive smoothly across Austria, the Czech Republic often has to cross several unwanted stops.

Table 10 – Railway barriers and restrictions compared to road transport with influence to transport costs

Problém areas	Railway transport	Road transport
Transit across borders	one driver is not authorized to drive a traction vehicle in other countries (unknown routes), language barrier, delays due to train inspections and handovers	smooth transit (within the EU - no border delays, outside the EU - customs checks)
Introducing new international lines	more complicated (cooperation of more carriers, eg KD operators and freight forwarders in different countries)	easier - just arrange 2 freight forwarding companies in different countries to ensure transport across several countries
Types of cars, types of goods	problematic (on certain substrates there are special wagons that cannot be loaded with another kind of goods in the foreign station at the destination station)	it is possible to transport different kinds of goods (eg on pallets), there are also special refrigerators, tanks for food or chemicals (they also have restrictions - they are intended only for certain goods)
Transport price (transport charges), back load	paid for transport route on all lines, no backloading - is problematic (the customer pays for both directions of transport)	only for motorways (or first-class roads), trucks also travel on lower-category roads to reduce the price or to embrace the bottleneck, usually trucks are back-loaded
Infrastructure - network scope, traffic management	lower network density, interstate freight transport is carried out mainly on interstate railway corridors (double-track electrified corridor lines), security equipment (signaling regulations) slightly differs in each country	has a higher network density, in the case of accidents theoretically greater possibilities are to avoid the accident site (on the other hand, in the case of a highway accident it is usually associated with a delay in delivery) traffic control signs are almost the same in all countries
Infrastructure - power systems, track gauge	incompatible power supply systems to the electrification. lines in different states (direct or alternating current), different gauge of railways in some countries eg Ukraine, Russia, Spain	roads in all states and intersections are designed to similar standards
Communication and information transfer	more complicated - insufficient application of EU directives for telematics in freight transport - problematic obtaining information about train locations abroad (in relation to railway infrastructure of certain countries - Poland), necessity of equipping ETCS traction vehicles	simpler (by phone, email), trucks must be equipped with on-board units for data transmission in the toll system
Speed of transport, time of transport	trains run late (downtime due to insufficient throughput and waiting in the railway station due to the priority of passenger transport)	trucks are much faster, more reliable in terms of delivery time (Just in time deliveries)
Reliability, safety, accidents, goods damage	is not reliable (delays due to track reconstruction, other operational problems, it is safer in terms of accidents	it is more reliable (eg fragile, perishable goods - it transports food more reliably), occasionally road accidents also occur and goods are damaged
Necessity to reload goods ("last mile")	Customers (manufacturing companies or trading companies) usually do not have a siding connection of their operations (or warehouses) to the railroad (depending on the type of products produced and the volume, if they send goods by rail, they have to tranship the goods at the end. - increases the cost of transport (extra costs)	most production companies use trucks to import material for production and import of finished products (mostly goods on pallets)

5.2. Average speed of transport

In addition to the price of transport, the speed of transport plays an important role in the division of transport work between road, rail and water transport. Higher speed is especially important for expensive or perishable goods. However, for many commodities, the reliability of supply is also important, where water transport on high quality waterways has priority. There are no congestions on waterways that cause unforeseen delays. The feasibility study of D-O-L, which, based on surveys:

Table 11 – Average speed by mode of freight transport

Transport network element	average speed (km/h)
Highways and expressways	67 km/h
Class I roads	47 km/h
Class II roads	37 km/h
Municipal collection roads	33 km/h
Railway line	33 km/h
Inland waterways	9 km/h
Source: Feasibility study of the DOL connection, own processing	

It is necessary to add these facts to the table:

- for water transport, it is not a technical speed (which is usually around 15 km / h for economic reasons), but a speed when taking into account lock delays; from this point of view, the speed is finite;
- For large ships, it is economically worthwhile to rotate 2 crews during a voyage, so that many waterways sail 24 hours a day;
- for rail and road transport in particular, the resulting speed is uncertain with regard to congestion;
- in railway transport, the speed is given by the technical condition of the lines, which is not good and therefore there are different line speed limits on the lines
- in addition, the speed in rail freight is low due to the maximum utilization of track throughput, where these trains often stop due to the preference of passenger trains
- In general, in rail transport, the biggest difference is between the average speed and the maximum permitted speed (currently 100 to 120 km / h, with the prospect of increasing for some types of trains to higher values), which is due to poor organization of transport, especially at border crossings, giving priority to passenger transport and poorly dimensioning the capacity of the lines as part of the modernization work
- Rail transport in the Czech Republic also does not have a sufficiently sophisticated organization of transport at the time of regular maintenance and accidents, when delays in transport are fatal and may endanger whole business cases due to the turnover of trains or links to other processes - for example

- For road transport, it is necessary to take into account not only congestion but also mandatory breaks and various national restrictions (eg weekends, etc.)
- According to the Slovak Association of AROS, the freight train travel between Hungary and the North Sea ports is 6 to 12 hours shorter and the average travel speed is up to 50% higher.

Example for long distance railway transport:
East Line Train - Every week, goods are sent to Eastern Europe from the Lovosice terminal. Within 48 hours the container train arrives in Malaszewice (Poland). From Brest, connections to the countries of the former USSR (Russia, Belarus, Kazakhstan, the Baltic Republics, Uzbekistan, Tajikistan, Kyrgyzstan, the Transcaucasus Republic), Mongolia, North Korea, China and Afghanistan are ensured. Section Lovosice - Malaszewice is about 900 km long, average speed is lower than 20 km per hour.

Example from time of Corona virus crisis:

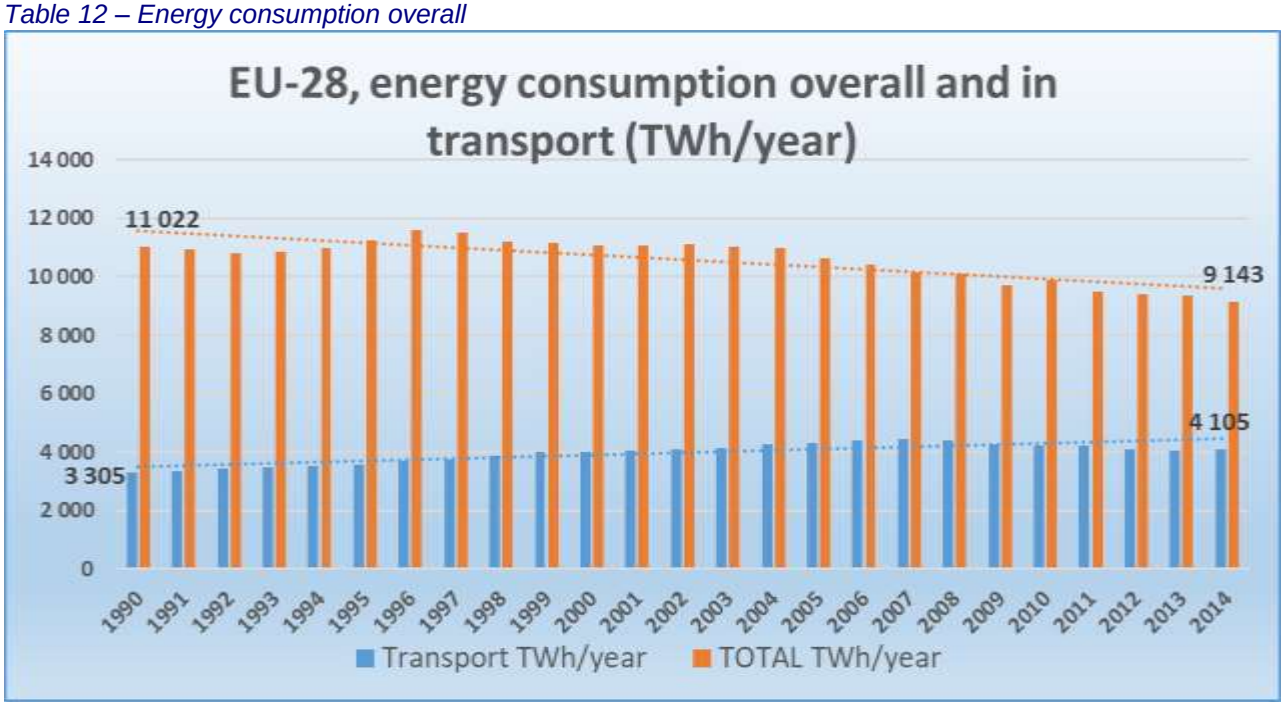
- Driving time for freight train Kolín – Bohumín 5 hours, average speed 60 km/h.
- Driving time for freight train Česká Třebová – Praha libeň 2,5 hours, average speed 67 km/h.
- Driving time for freight train Děčín – Štúrovo 10 hours, average speed 66 km/h. When we deduct 3 hours downtime due to a lockout in Bratislava – Vajnory, final average speed is more than 90 km/h.
- Driving time for freight train Kolín – Děčín 2 hours, average speed 80 km/h.

From this point of view possibilities of network are twice more speed than real state in normal conditions. Main problem is not maximal speed, which is about 100 km/h, but working of network operator.
Note: Based on freight train drivers informations from webside www.zdopravy.cz on 20th March 2020.

5.3. Power consumption

Energy consumption is currently a highly monitored economic and environmental category item - both in and outside transport.
It is worth noting that while the overall energy intensity in the EU is gradually declining (to 25% in 1990 over 83% of 1990 levels), transport consumption is increasing, both in relative and absolute terms - to 124.2% compared to 1990. Therefore, shipping and rail transport, as sectors with lower energy consumption, enjoys considerable support from a number of European governments and EU representatives.

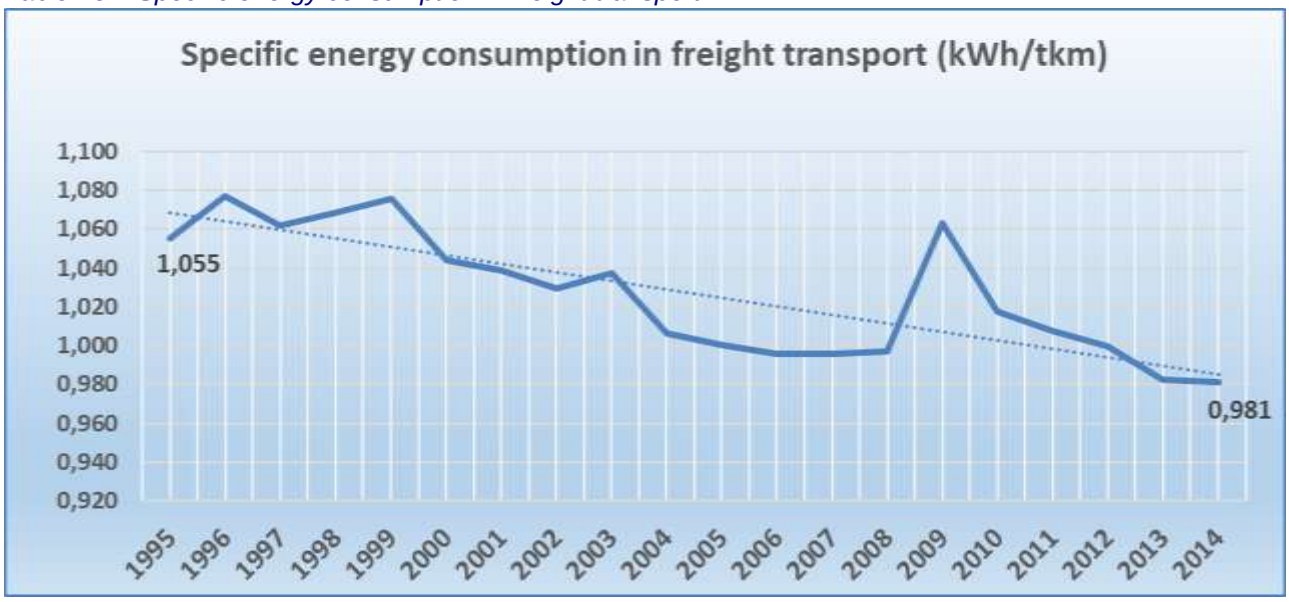
Table 12 – Energy consumption overall



Source: Statistical Pocketbook, own procesing

Despite this, a number of measures are also being successful in transport, which gradually reduce specific energy consumption - the overall increase is therefore mainly due to the overall increase in transport.

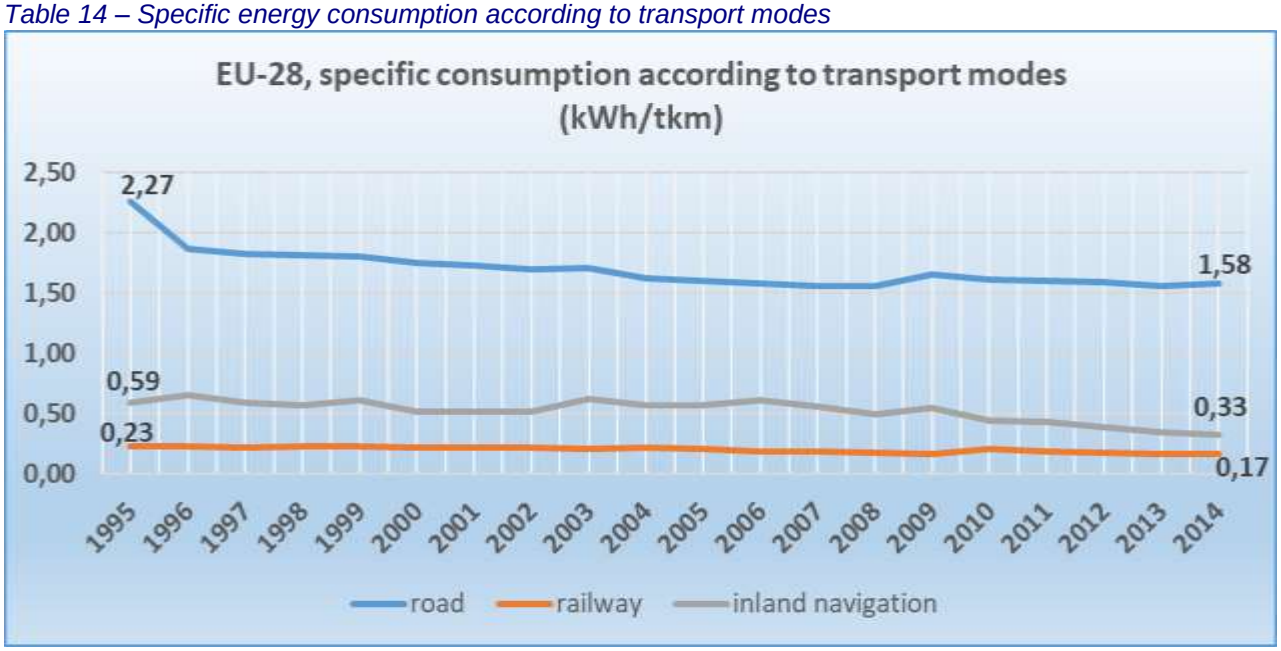
Table 13 – Specific energy consumption in freight transport



Source: Statistical Pocketbook, own procesing

Consumption in the different modes of transport is also best demonstrated in the long-term series of European statistics:

Table 14 – Specific energy consumption according to transport modes



Source: Statistical Pocketbook, own procesing

These data also make it clear why the EU intends to give priority to rail and water transport in the long term, as repeatedly stated in EU documents.
In addition, continuous research and innovation is underway in all transport sectors - for example, ships operating not only for natural gas (LNG) but also for electric and hydrogen propulsion already exist in shipping. These trends will undoubtedly intensify.
In the case of rail transport, which operates on electric lines and is environmentally friendly, some of the energy generated during the operation of the train can be returned to the network - this is called recovery.

5.4. Impacts on the environment

Small environmental impacts (so-called externalities) are among the important and recognized advantages of water and rail transport.
A number of studies and methodologies exist in Europe to determine the external effects of transport, some more complete (more criteria), others less comprehensive; moreover, they often give very different results. This allows different groups of experts and public officials to selectively select more welcoming data for them.
The authors of the study “Socio-economic Impact on the Development of the Lower Visa” (Gdańsk, 2017) chose a reasonable approach and decided to compile the averages of more relevant European studies.
A similar approach was chosen, for example, for the feasibility study of the Danube-Oder-Elbe water corridor, but with the originally used resources being extended by the "climate effect" parameter, according to research by Inland Navigation Flanders.

Table 15 – External costs – current status

Comparing the external costs of different modes of freight transport (€/1 000 tkm) - current status									
current status	road			railway			inland navigation		
	Vito	EC	PLANCO	Vito	EC	PLANCO	Vito	EC	PLANCO
accident	22,8	5,4	37,8	1,6	1,5	2,3	0,1	0,0	0,3
noise	4,4	2,1	7,4	2,8	3,5	12,7	>0,1	0,0	0,0
air pollution	9,1	8,7	29,1	0,4-9,46	4,3	3,5	5,4	3,0	4,2
congestion	5,4	5,5	1,2		0,2	0,0			0,0
necessary areas	1,9	2,5	0,0	0,2	2,9	0,0	0,7	1,0	0,0
other			1,3			0,4			0,0
water and soil pollution			8,6			0,0			0,0
TOTAL	43,6	24,2	85,4	2,3	12,4	18,9	6,2	4,0	4,5
AVERAGE	**51,07**			**11,21**			**4,89**		
Climate Impact According to *Inland Navigation Flanders*	**0,79**			**0,3**			**0,5**		
TOTAL	**51,86**			**11,51**			**5,39**		

Souces: Socio-ecomic Impact of the Development of the lower Vistulaon the basis of the documents: VITO-*Flemish Institut for Techological Research, Belgium;* EC-*European Comission, Brussels;* PLANCO-*Planco Cosulting; Inland Navigation (climate)*

Given the expected innovations in the field of transport, the following data can be expected in the future:

Table 16 - External costs - future expected status

Comparing the external costs of different modes of freight (€/1 000 tkm), future expected status									
	road			railway			inland navigation		
	Vito	EC	PLANCO	Vito	EC	PLANCO	Vito	EC	PLANCO
accident	22,8	5,4	37,8	1,6	1,5	2,3	0,1	0,0	0,3
noise	3,1	1,5	5,1	1,4	1,7	6,3	>0,1	0,0	0,0
air pollution	8,8	8,5	26.0	0,2-4,73	2,2	1,8	3,8	2,1	2,9
congestion	5,4	5,5	1,2		0,2	0,0			0,0
necessary areas	1,9	2,5	0,0	0,2	2,9	0,0	0,7	1,0	0,0
other			1,3			0,4			0,0
water and soil pollution			8,6			0,0			0,0
TOTAL	42,0	23,4	54,0	1,4	8,5	10,8	4,6	3,1	3,2
AVERAGE	**39,80**			**6,89**			**3,63**		
Climate Impact According to *Inland Navigation Flanders*	**0,65**			**0,2**			**0,4**		
TOTAL	**40,45**			**7,09**			**4,03**		

Sources: *see above, own correction*

5.5. Safety

Another advantage of water and rail transport is its high safety. This is also evident from the tables on external transport costs, where for all sources the data on inland navigation are multiply more favorable than for railways and even for whole orders against road transport.
Statistics on deaths and injuries in road accidents are given, for example, by the Texas Transportation Institute:

Table 1 - Dead and injuries in traffic accidents (persons / billions tkm)

	death in a traffic accident	% relative to the road	**injuries in accidents**	% relative to the road
Road	1,000	100,0%	1,0000	100,00%
Railway	0,015	1,5%	0,0600	6,00%
Inland navigation	0,006	0,6%	0,0005	0,05%

Source: Texas Transportation Institute

Table 18 - Comparison of road and rail accident rates in the Czech Republic

rok	**silnice**	**železnice**
2000	211 516	215
2001	185 664	205
2002	190 718	428
2003	195 851	316
2004	196 484	311
2005	199 262	649
2006	187 965	374
2007	182 736	241
2008	160 376	316
2009	74 815	231
2010	75 522	280
2011	75 137	202
2012	81 404	189
2013	84 398	167
2014	85 859	193
2015	93 067	176
2016	98 864	181
2017	103 821	190
2018	104 764	172

5.6. Operation of railway infrastructure

5.6.1. Basic rules

In general, for each line on the rail network there are timetables for passenger and freight trains (regular and as needed) and at the same time are graphically captured in the timetable (GVD) for the given period. Passenger trains always run according to GVD - they follow their route over time, although sometimes with delays caused by accidental traffic problems. Freight trains are different. Freight trains of higher categories have priority over freight trains in service of lower categories, ie. that they usually follow their routes according to the rides. of the order (eg Nex trains and so-called "Termincargo" trains, which must arrive at the end station, if possible in time, because otherwise the carrier is penalized according to the contract with the customer for failure to comply with the delivery time). Freight trains of lower category have lower priorities in operation and therefore also mostly more downtime on their route due to the preference of passenger trains and freight. trains of higher categories. In the period prior to the creation of a new GVD, carriers must ask SŽDC for the allocation of railway capacity and for the train path - report the list of trains and the required paths (the necessary documents for submitting the application are in the Rail Declaration). They must pay for these requests and also in cases where they do not use the required routes. Because they do not want to pay unnecessarily for unused routes, because they are penalized if there is an extraordinary need to introduce a new train (in addition to the original GVD), carriers ask SŽDC "ad hoc" allocation of track capacity. at the time of more than 3 working days. days or 3 or less working days before the first day of travel) of capacity allocation and train path.
In service, passenger trains take priority over freight trains. However, Nex freight trains take precedence over passenger trains.

5.6.2. Operating practice

Especially on the corridor lines (including lines 305B, 301A and 301D in the TRITIA region), freight trains are often stopped and waited at stations to allow priority trains of the Ex and R category, especially during the day. A high number of these passenger trains run in certain sections and the throughput is used to the maximum.
The speed difference between long-distance passenger trains and freight trains has increased due to the modernization of the corridors (GVD routes are not parallel) - for freight, there are only limited time and distance windows in GVD. As a result, the journey time of freight trains is considerably slower than its technical and technological capabilities, ie instead of the theoretical average speed of 70 to 80 km / h, the average speed of freight trains is around 33 km / h.
Due to the fact that many lines and stations (mainly large railway junctions) have been reconstructed in recent years, there are often delays especially in the spring - autumn period due to construction works on the lines. Therefore, freight trains have a better chance to travel their route on certain lines without much time loss (downtime) at night (0 - 4 h), when there is no passenger transport. Unfortunately, long distances must always be part of the route during the day.

Figure 8 – Map of the most important closures (track section repairs) for the period 2021-2023

Allocation of railway capacity - news for schedule 2019

Deadlines for submitting applications to plans. changes in annual RM 2019
receiving applications - until 8.4.2019
validity of the change - from 9.6.2019

Freight transport - new ad hoc product - DZ = long-term ad hoc allocation of rail capacity, where the time from receipt of the request to the first required train departure date is 20 or more working days (including the date of application) and 20 or more days are required driving within one application. The application is submitted via IS KADR (or data communication).

The reason for reducing the number of RPs was to allow carriers to submit a single application for the whole period of validity of the RP data. Greater flexibility in reconciling long-term routes with neighboring infrastructures. Remove multiple rescheduling of infrastructure constraint routes.

All Line Control Units (TJŘ) are displayed exclusively in the IS of the infrastructure manager (KADR, APORT) or in the form of data communication. TJR routes are available for the entire route.

DZ could be filed regardless of the date of the June change - ie also for the date of the June change.

The product factor P3 "freight transport within the collection and distribution system of individual wagon consignments (individual consignments)" can be purchased for the LC.

The condition of capacity allocation for this application is a favorable opinion of O5 / Department of Carrier's Performance and Fees Department

Description of infrastructure - in terms of RP 2019 there will be the following terms of network changes in KANGO STRAIN - 9/12/2018 (change in RP), 10/3 2019 (change of network beyond the change of RP), 9 June 2019 (change of RP) , 8 September 2019

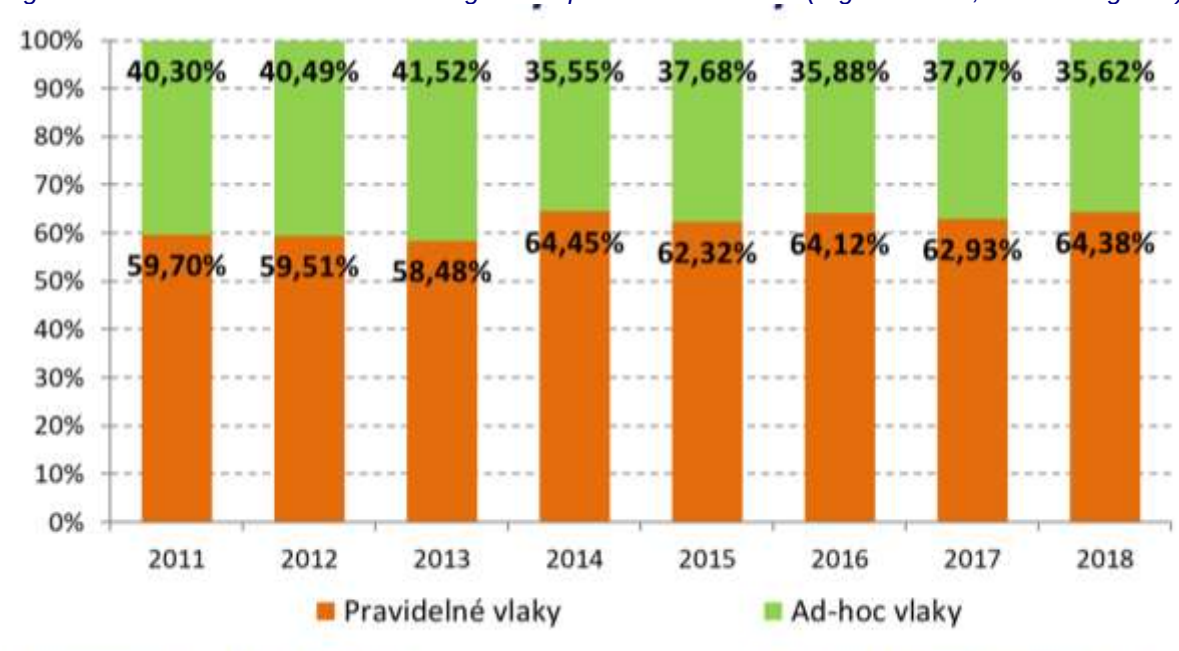
(change of network beyond the change of RP).
Offered freight transport routes including locomotive trains are included in the document "Timetables of annual freight and locomotive trains routes for the period 2019". Documents are also available at provoz.szdc.cz
When asked to ETD, APORT returned TJŘ bid routes only to the user of the carrier in the case of assigning the number of bid routes to the carrier.
For the ad hoc train design, the Line Timetable (TJŘ) is available at KADR, APORT and ETD at the time of capacity allocation.

Table 19 –Comparison of train paths allocation and actual freight train journeys in some cross-border stations

Přidělená kapacita dráhy	15/16		16/17		17/18	
Lanžhot - Kúty: roční JŘ	11 295	**57%**	12 535	**54%**	7 433	**60%**
Lanžhot - Kúty: ad hoc	8 656	**43%**	10 652	**46%**	4 901	**40%**
celkem	19 951		23 187		12 334	
Horní Lideč - Lúky pM: roční JŘ	1 985	**58%**	2 724	**67%**	1 522	**70%**
Horní Lideč - Lúky pM: ad hoc	1 435	**42%**	1 318	**33%**	646	**30%**
celkem	3 420		4 042		2 168	
Mosty uJ - Čadca: roční JŘ	11 781	**73%**	10 507	**69%**	5 853	**59%**
Mosty uJ - Čadca: ad hoc	4 274	**27%**	4 811	**31%**	4 075	**41%**
celkem	16 055		15 318		9 928	

Notice: The data in the table - the last column - are for the period January - June for schedule 2017/2018
Source – Prezentation SŽ Train paths allocation, international activities - conferences with carriers, Ing. Šlachtová 21.11.2018)

Figure 9 – ratio of realized routes in freight transport within Slovakia (regular in red, Ad-hoc in green)



Source: Presentation of ŽSR access to railway infrastructure in schedule 2018/2019 (Poprad, 21.11.2018)

Orders of train routes to year-round GVD in case of international trains are placed through the IS RNE PCS system. The ordering of train paths for national trains shall be made using the form annexed to the Terms of Use of the 2019/2020 rail network. Ways of applying for international train paths ad-hoc (IS PIS):

- through the European coordination system RNE PCS,
- for trains without a separate timetable via IS PIS (Operational Information System) (Ordering application OSS),
- for trains with special timetable via PIS VDS PT (PIS route planning).

Given the prevailing share of large companies that regularly transport by rail, the primary mode of transport of goods is a complete train from one consignor or one customer respectively. This is due to the primary use of sidings as liaison and transhipment points. Another reason for the prevalence of coherent trains is the large volume of transport of iron ore and coal, which are carried in large volumes and are routed on regular routes and have the largest share of volumes in the railway infrastructure.

5.6.3. Cross-border traffic and related problems

At border crossing stations on the Polish border (PKP PLK), ie in Bohumín - Vrbice, Chalupky, Petrovice u Karviné and Zebrzydowice, the transport tracks are occupied by too long stays of international freight trains. These are caused by problems related to non-harmonization of processes and deadlines in relation to cross-border traffic management (IS-information systems, train path requests, timetables, transmission of train position information on the network, non-harmonization of closures, etc.) ie**:**

- **Problems with passing information about trains** (location, train composition, etc.) between neighboring infrastructure managers - insufficient IS compatibility and also the level of interconnection. equipment for train traffic control at PKP PLK in comparison with SŽDC. Operational dispatchers at the CDP in Přerov must telephone the position of the trains on the PKP PLK network from Polish carriers by telephone, process the data into tables and transmit them to the line dispatcher for this line. But also Czech carriers are not informed about train movements in Poland. They only know where their trains are and what the forecast of their arrival at the transfer station is. Some carriers (eg AWT, a.s.) therefore equip their trucks with GPS sensors to be able to have their own information about the movement of their trains abroad (because the locomotives exchange the border).
- **PKP PLK IS does not allow sending information from Czech carriers to their IS**.
  In PPS Zebrzydowice, train data (train composition, etc.) is entered into IS PKP PLK only after the arrival of the train in this PPS it is not possible to send information about trains arriving from SŽDC network in advance using electronic data transmission from SŽDC IS.
  SŽDC is trying to implement European standards on its infrastructure - for example, they have introduced the message structure TSIs (they serve for mutual communication between infrastructure managers and carriers). PKP PLK has not yet implemented them on its infrastructure. For this reason, there are problems in the communication of carriers, where everyone operates in a different state.
- **The problem of capacity allocation - on PKP PLK and SŽDC** there are so different conditions for the application and allocation of capacity that it is practically

impossible for the carriers to respond flexibly to the operational situation. Allocation of the Lv route is awaited for several hours (usually 2 to 3), for the freight train route and more. In addition, the different conditions give rise to deviations in train parameters when applying outside PCS, which both infrastructures regard as inability of carriers to agree and the reason for not allocating capacity.
In case of requests for individual “ad hoc” allocation of the railway capacity (ie within 3 days or more or 3 days or less) from the submission of the application to its implementation, there are problems with matching the applications (for the same train). The Czech carrier will agree with the Polish carrier about the time of the handover of the train at the border station, but the Polish carrier will report to his infrastructure manager (PKP PLK) another time (earlier - including the time reserve for himself). This means that routes at the destination point should be matched by time, which cannot be done because times do not match.

- The **timetables concerning the arrival of trains** from the SŽ and PKP PLK network to the PPS of cooperating smaller carriers **are not hamonised**, so that locomotives can be switched over easily and trains can be handed over to each other. In order to avoid having to wait in the PPS for the locomotive of the neighboring carrier after disconnecting the locomotive that brought them. There are even other timetable data changes on the PKP PLK than in the rest of Europe.
- There are **no hamonized deadlines for processing ad hoc route** requests and the possibility of fast route allocation and RP for departure from PPS towards Poland (by PKP PLK). PKP PLK does not allocate capacity on an individual path request submitted less than 8 hours before the scheduled train departure time or less than 3 hours for an LV train.
  The unharmonised train path lifetime for SŽDC is 20 h and for PKP PLK it is 24 h.
- The **current system of route allocation in the cross-border section is not prepared for the transport of individual wagon consignments** or small groups of wagons. If, on one side of the border, a single train carries a collection train with a load for several carriers on the other side of the border, it must necessarily break down one train into as many trains as there are other efficient carriers and these trains run separately across the border. This is a segment of transport that is currently on the increase in conventional wagon consignments.
- The problem is to **identify the train** (in the categorization of trains) whether it is a national or international train. PKP PLK considers all trains (even those that cross the Polish border and are international) on their territory to be national. They become international trains only after crossing the national border (for this reason, Czech carriers are not sufficiently informed about international trains).
- There is **no harmonization in the field of train numbering and naming of their paths** - ie. Starting and ending stations (in the Czech Republic it can be a national train, but it continues to Poland - to another railway station and vice versa from Poland) - trains are marked with different numbers and it is not clear that it is the same train.
- **Train location information is reported** by the infrastructure manager to the RNE TIS system (headquarters in Vienna), **but carriers can only obtain it from the system for a fee** and may not be willing to pay for it, which considerably delays operational traffic management.
- Charges for using PKP PLK infrastructure - **Carriers on the PKP PLK network have to pay twice for a train path if the train path passes over midnight** and is

therefore included in two days. This is the reason why carriers in the direction of travel to the PKP PLK network for long routes, when they know that they will not be able to reach the destination station on a given day, rather wait PPS Petrovice u K., although they could leave eg in the afternoon. This causes unnecessary stays and blocking of tracks in PPS for other trains that could be cleared. The SŽ network pays a fee for passing the route by train regardless of whether the route will be realized in two days.

Problems related to operational technology in border station and cross-border traffic management

- For international trains that are assembled at any station on the SŽDC or PKP PLK network, before their departure to the cross-border station, the technical inspections of the trains are not carried out with sufficient care and the coaches are discarded in time. This problem is shifting to the cross-border station, where the scrapping of utility cars causes unnecessary delays at the border and, above all, unnecessarily occupies the transport tracks in the cross-border station, reducing their throughput. There is a need for shunting locomotives and shunting movements occupy the head and limit the entry of other trains into the cross-border station.
- Poor technical condition of the fleet of Polish holders and the condition of loading of cargo requires a thorough check of the handover and thus the stabling of trains on stabling tracks at border crossing stations (eg in Petrovice u Karviné).
- Small carriers do not provide information on technology in PPS together with the request for train path. what activities they will perform with the train. Only ČD Cargo, a.s. it sends this information. He needs this information to control the operation of CDP in Přerov.
- It is necessary to better plan the organization of drivers' shifts and their replacement in the cross-border station, so that at the end of the shift the next train driver takes over immediately and the train does not unnecessarily prolong the stay in the cross-border station.
- Coordination of closures between PKP PLK and SŽ is generally very low. There are collision situations at different crossings, which means that the diversion is not applicable. The problem is also to pass through railway junctions in Poland.
too long time reserves for train stays in PPS, which are allocated by RIA within the allocation of train path and timetable approvals, are abused by drivers who report to the dispatchers a call for departure to PKP PLK just before the end of the deadline. SŽDC provides time for trains. a margin of delay of max. 24 h and a gap of max. 3 h.
- PKP PLK prefers internationally loaded trains, but as far as trains with empty wagons are concerned, they run late to PPS on the border with the Czech Republic for example by 10 hours. They do not realize that they have the same priority because the carrier needs wagons and earned on further transportation of goods. Standing fleet does not earn.
- Also security level. The equipment for railway operation is much higher on SŽ railways than on PKP PLK railways. It's a question of finance. In the Czech Republic, SŽ wants to drive safely and reliably and also invest more in the facilities of its employees.

Problems in the border station Petrovice u Karviné in relation to traffic management and information transfer

Most of the trains from the network of SŽ that go to Poland mostly use PPS Petrovice u Karviné or Bohumin-Vrbice, because no other border crossing on the double-track electrified line is currently available.

Trains traveling across the territory of several states, eg from Poland through the Czech Republic to Austria, which during their journey accumulate large delays already in the first TSO between SŽ and PKP PLK transfer this delay to the next train path and therefore cannot use their original route and they have to wait for a new route in another TSO between SŽ and ÖBB Infrastruktur (eg in Břeclav). This increases their delay further. Furthermore, too long stays of international freight trains and their delay at the border have an impact on the competitiveness of international rail transport compared to road transport. PPS locomotives are made because most locomotives do not have homologation. approval to travel on the rail network of other infrastructure managers abroad. For example, they are not equipped with mobile ETCS equipment, etc.

Only the latest locomotives Vectron and Taurus, Traxx, Eurosprinter, Eurorunner (mainly Siemens and Bombardier products) can operate on the railway network in various European countries. Some older locomotives such as 740, 753 can travel across the border to Hungary, Poland.

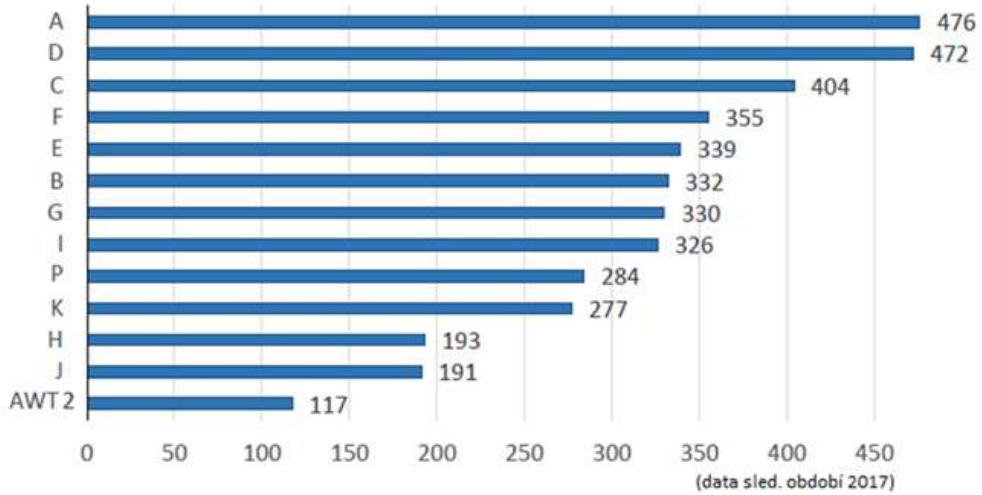
It is apparent from the above that the problem is primarily the need for own handover of trains in the cross-border station, which does not occur in other modes of transport and therefore does not have to address these problems. Due to the linguistic kinship in the Tritia region, the possibility of smooth passage of border trains with the deployment of a single driver and a locomotive compatible for more than one country is not excluded. Even in the case of commercial sections for a given carrier, this is possible by sharing resources between carriers on the basis of reciprocal agreements - see, for example, the International Contingency Management (ICM) project.

- poor technology of cross-border processes in terms of the frequent need to deal with emerging situations (shifts of administrators, delays, shifts exceeded while waiting) compared to the originally planned state
- very long train journeys waiting for a locomotive (partner carrier) or train driver to block unnecessarily tracks and throughput
- ldetection and decommissioning of coaches from trains, which results in unnecessary shifts and cancellations of traffic to the head and prolonged train stays before their departure to the PKP PLK network
- insufficient number of tracks, need for longer tracks for long loads. trains, necessity of railing of another 2 tracks along the whole length and runs of tracks of another 2 tracks - will be solved by reconstruction in 2021 (DSP of the construction of Dětmarovice - Petrovice u. Karviná for prospective transport)
- due to the filling of the station, trains are only coming to the cross-border station, which implies the need to send additional drivers, the train premature train stop, in many cases a new brake test and technical inspection (requires additional staff).
- In case of voltage outages (which excludes even or odd group of tracks from operation) and which take place during the day, the throughput of the station is very limited. It is necessary to switch off the current in the whole track group (odd or even) for the given direction of travel - in the direction of travel on PKP PLK it is the

majority of the track. Operation is only possible at night when the lockout is not in progress. It should also be addressed as part of the reconstruction in 2021.

In addition, PPS Zebrzydowice pays for the stay of trains on the rails (when they have to wait for their locomotive from the Czech side), but not in the Czech PPS Petrovice u Karviné. Therefore, the carriers are trying to cross over to Petrovice u Karviné (which is also due to these conditions overloaded and its capacity is insufficient traffic.

Figure 10 – Average downtime of AWT, a.s. (now PKP International, a.s.) in Petrovice u Karviné in minutes



Note: On the train during this period there were only drivers changing, locomotives on the train usually remained the same)

Table 20 - Number of freight trains in cross-border stations on SŽ, PKP PLK and ŽSR networks in 2019

Name of station	Year schedule	Ad hoc	Total
Bohumín-Vrbice cross-border	6 957	6 901	13 858
Bohumín cross-border	1	1 159	1 160
Petrovice u Karviné cross-border	4 490	12 084	16 574
Mosty u Jablunkova cross-border	8 616	7 528	16 144
Břeclav cross-border (no TRITIA border)	10 047	5 465	15 512

The table shows that the number of freight train routes that were implemented on ad hoc requests through the Petrovice u Karviné cross-border station is the highest in the TRITIA region, and almost twice that of the Bohumín-Vrbice cross-border station. The Bohumín-Vrbice and Mosty u Jablunkova cross-border station have a much smaller number of realized routes thanks to ad hoc requests. Almost 2/3 of the train paths in Petrovice u K. were implemented as ad hoc routes and only 1/3 as the annual timetable routes.
The cross-border station Bohumín-Vrbice and Mosty u Jablunkova had the ratio of routes implemented within the annual RP only slightly higher than the ratio of ad hoc routes.

Table 21 - Number of delayed NEX freight trains in cross-border stations on SŽ, PKP PLK and ŽSR networks in 2019

Name of station	number	weight (t)		delay (min)	
	trains	Total	průměr	Total	average
Bohumín-Vrbice cross-border in	1684	2825541	1678	803848	477
Bohumín-Vrbice cross-border out	1898	1835181	967	796896	420
Bohumín cross-border in	9	9206	1023	2372	264
Bohumín cross-border out	44	43875	997	13602	309
Petrovice u Karviné cross-border in	1992	1878886	943	555798	279
Petrovice u Karviné cross-border out	2107	2457601	1166	747863	355
Mosty u Jablunkova cross-border in	4130	9250936	2240	1210422	293
Mosty u J. cross-border out	3445	4443883	1290	883352	256
Břeclav cross-border in	4179	4185158	1001	685520	164
Břeclav cross-border out	4566	6641490	1455	584968	128

The table shows that the largest number of Nex category trains passed through cross-border station (Břeclav), Mosty u Jablunkova, then Petrovice u Karviné and finally Bohumín-Vrbice. The biggest train delays when passing through the PPS were in Bohumín-Vrbice (both entering and leaving SŽ) and then in Petrovice u Karviné (larger at the exit from the network to PKP PLK) and finally in Mosty u Jablunkova (more at entry to SŽ network).
Most of the volume in tonnes was transported through the Mosty u Jablunkova PPS.

Table 22 - Number of delayed NEX freight trains in cross-border stations on SŽ, PKP PLK and ŽSR networks in 2019

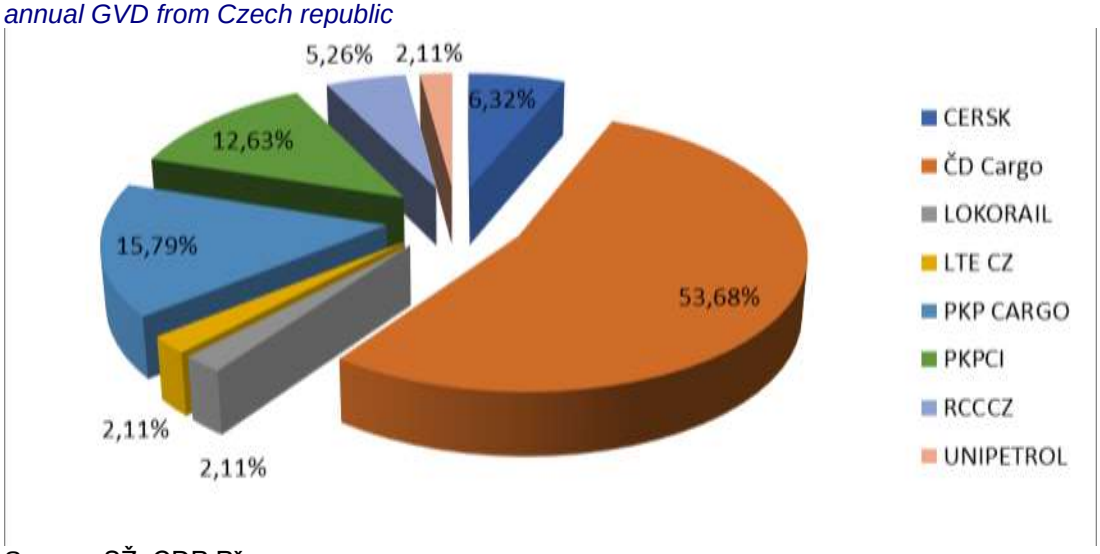
	number	weight (t)		delay (min)	
	trains	Total	average	trains	Total
Bohumín-Vrbice cross-border in	3773	6751971	1790	1523654	404
Bohumín-Vrbice cross-border out	3462	3637754	1051	1083132	313
Bohumín cross-border in	300	601597	2005	98373	328
Bohumín cross-border out	341	445039	1305	100177	294
Petrovice u Karviné cross-border in	4892	8548645	1747	1601037	327
Petrovice u Karviné cross-border out	4316	4901580	1136	1818137	421
Mosty u Jablunkova cross-border in	1822	2248883	1234	511431	281
Mosty u J. cross-border out	2672	4505060	1686	653726	245
Břeclav cross-border in	1933	1539604	796	195555	101
Břeclav cross-border out	2055	2917114	1420	214089	104

The table shows that the largest number of Pn category trains passed through the cross-border station Petrovice u Karviné, then Bohumín-Vrbice and finally Mosty u Jablunkova. The biggest train delays when passing through cross-border station were Petrovice u Karviné (larger at the exit from SŽ network to PKP PLK network) and in Bohumín-Vrbice (larger at the entrance to SŽ network), at Bohumín and finally at Mosty u Jablunkova (more at entry) SŽ network).
Most of the volume in tonnes was transported through the Petrovice cross-border station at Karviná.

According to the Center of Traffic Operations of SŽ in Přerov train arrivals to cross-border station Petrovice u Karviné are organized according to the determination of train essentials

(locomotive, driver) for individual trains. If the essentials are not specified, the train is not taken to the cross-border station Petrovice u Karviné.

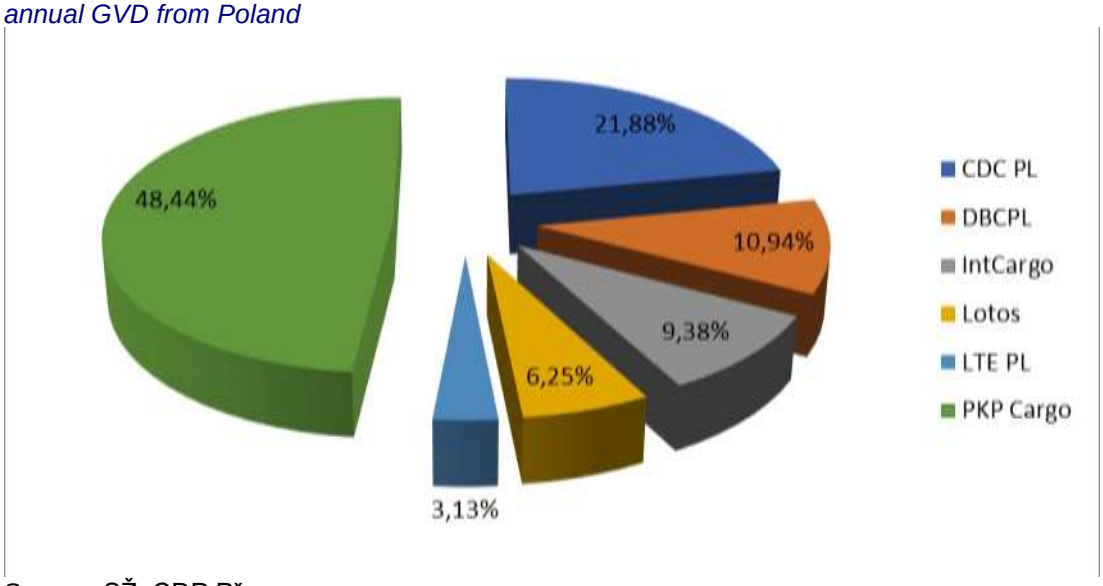
Figure 11 – Share of routes of individual carriers in the railway station Petrovice u Karviné according to the annual GVD from Czech republic



Source: SŽ, CDP Přerov

The graph shows the share of individual carriers on the arrival / departure side of the Petrovice u Karviné railway station from and towards the interior. These are numbers according to the annual timetable and therefore the routes ordered by ad hoc carriers are not included here.

Figure 12 – Share of routes of individual carriers in the railway station Petrovice u Karviné according to the annual GVD from Poland



Source: SŽ, CDP Přerov

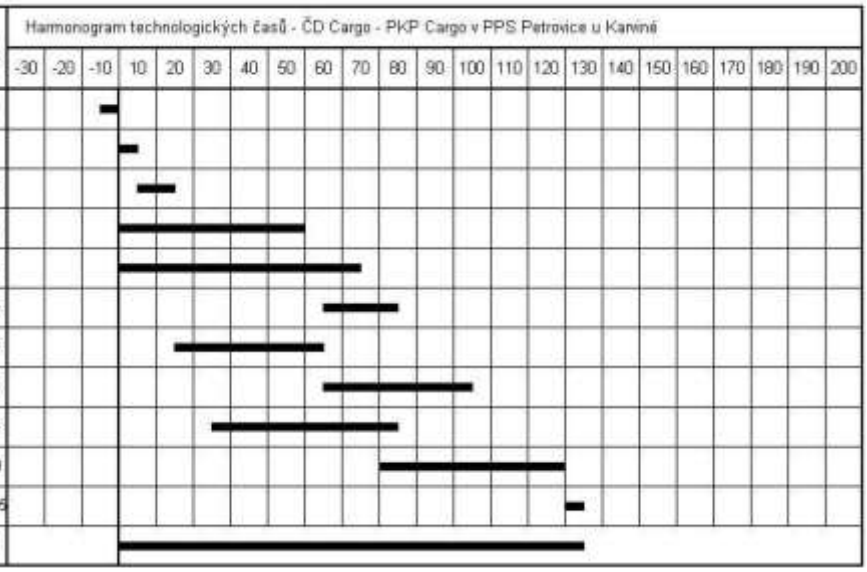
The graph shows the share of individual carriers on the arrival / departure side at the Petrovice u Karviné railway station from and towards PKP PLK. These are numbers according to the annual timetable and therefore the routes ordered by ad hoc carriers are not included here.
The average stay per train from the annual GVD is 110.7 minutes. The stays are intended

for the basic technological operations of the carrier, mainly for the bulkhead, alternation of the locomotive crew, technical inspection of the train and brake test. The longest specified stay according to GVD is 298 minutes (ČD Cargo / DBCPL).
14.74% of the routes are without technological operations (stopping for traffic reasons only). According to carriers, it is ČD Cargo on our side, which has 25.49% of its regular routes without operations and 92.86% it is CDC PL on the Polish side (cooperating carrier). There is also PKP Cargo, which has 6.67% on our side and 3.23 on the Polish side.
The delay of trains due to management wagons in cross-border station Petrovice u Karviné is not closely monitored. There is no recurring regularity and the cases in operation are random.
The biggest share of train delays, not only in cross-border station, but already on the train route, is precisely the locomotive requirements. This shows the ability of the carrier to cooperate correctly with its partner (carrier), ie the mutual transfer of information, the creation of a plan and the determination of particulars.

The length of occupancy of the railway tracks in the cross-border station Petrovice u K. and Bohumín-Chałupki depends on the total check-in time of the trains. It consists of a number of activities, ie train reroutment, driver changes, train inspections, full brake testing (according to the accepting carrier's regulations), check of the list of vehicles on board the train elaboration of new documentation (vehicle inventory and braking report). The total average time required to check-in a train at cross-border station Chałupki is about 166 min. and in cross-border station Petrovice u Karviné cca 125 min. This implies that an average of 8 or 11 trains a day are used in a TSO per day. The stages of gradual departure and entry Iov (on the same transport track) are not considered here. Train clearance can be accelerated by changing the technology of data processing and transfer, or by agreement in mutual technical confidence in the transfer of trains, for which the operating state of the entire train is guaranteed by the carrier that handed over the train. The table shows that the train 47005 waited 11 times for a free entrance track to PPS Petrovice u Karviné and the train 47001 waited 10 times for a free entrance track to PPS Chałupki. In both cases, it is a **third of the trains that cannot enter the cross-border station on their allocated route in Poland**.

Table 23 - Technological procedures of ČD Cargo, a.s. in cross-border station Petrovice u Karviné (2008)

poř. číslo úkonu	úkon	úkon provádí	čas (min)	trvání od - do
1.	Očekávání a příjezd vlaku		-5	-5 - 0
2.	Převzetí přepravních dokladů	T ČDC	5	0 - 5
3.	Doručení dokladů do přechodové kanceláře	T ČDC	10	5 - 15
4.	Přepravní prohlídka	A ČDC A PKPC	50	0 - 50
5.	Technická prohlídka	VZ ČDC VZ PKPC	65	0 - 65
7.	Vyhotovení OS	A ČDC	20	55 - 75
8.	Zpracování dokladů přechodový seznam	T ČDC	80	15 - 55
9.	Kalkulační činnosti	T ČDC	55	55 - 95
10.	Najetí lokomotivy spojení soupravy	VP ČDC	50	25 - 75
11.	Vytvoření ZoB + ÚZB	VZ PKPC	50	70 - 120
12.	Ohlášení pohotovosti v dopravní kanceláři	A ČDC	5	120 - 125
CELKOVÝ ČAS			125 minut	



Translation:

Očekávání a příjezd vlaku -	Expectation and arrival of the train
Převzetí přepravních dokladů -	Acceptance of transport documents
Doručení dokladů do přechodové kanceláře -	Delivery of documents to the transfer office
Přepravní prohlídka -	Transport inspection
Technická prohlídka -	Technical inspection
Vyhotovení OS -	Delivery OS
Zpracování dokladů přechodový seznam -	Processing Documents Transition List
Kalkulační činnosti -	Calculation activities
Najetí lokomotivy, spojení soupravy -	Locomotive start-up, set connection
Vytvoření ZoB a ÚZB -	Creation of ZoB and ÚZB
Ohlášení pohotovosti v dopravní kanceláři -	Emergency call in transport office

Table 24 - example of delayed train 47005 of 7.3.2018

Petrovice u Karviné				Břeclav			
Příjezd	Zpoždění	Odjezd	Zpoždění	Příjezd	Zpoždění	Odjezd	Zpoždění
4:59	662 min.	**13:46**	963 min.	**20:18**	922 min.	**8:11**	63 min.
Arrival	Delay	Departure	Delay	Arrival	Delay	Departure	Delay

In cross-border station Zebrzydowice, the train waited for the entrance to the PPS Petrovice u Karviné due to the release of the transport track. Since the prohibition was caused by the railroad operator, the train can continue on its route.
Due to delays in the Břeclav railway station, the route is inadmissible - it has expired at ÖBB Infrastruktur. The carrier must request a new train path.

Table 2 - Passage of train 47005 in cross-border station Petrovice u Karviné and reasons of disruption in 2018

		delay	*reason*		*delay*	*reason*	*stay in minutes*
Den	**Petrovice příj.** *17:57 h.*	**Zpoždění (min.)**	**Důvod**	**Petrovice odj.** *22:30 h.*	**Zpoždění (min.)**	**Důvod**	**Pobyt v PPS v JŘ** *273 min.*
1. 3.	**2:08**	491	D1	**12:19**	829	D2, D3, I1	**611**
2. 3.	**23:58**	361	D1, I2	**6:27**	477	D3, I1	**389**
3. 3.	**21:43**	226	D1	**5:17**	407	D3, I1	**454**
4. 3.	**21:35**	218	I2	**2:41**	251	D3	**306**
5. 3.	**14:28**	-209		**20:55**	-95		**387**
6. 3.	**8:06**	849	D1, I2	**15:19**	1009	D3, I1	**433**
7. 3.	**4:59**	662	I2	**13:46**	963	D3, I1	**480**
8. 3.	-	-	D0	-	-	D0	-
9. 3.	**2:34**	517	D1	**6:33**	483	I3	**239**
10. 3.	**23:22**	325	D1	**4:05**	335	I3	**283**
11. 3.	**22:50**	293	D1	**4:18**	348	D1	**328**
12. 3.	**22:54**	297	D1	**6:01**	451	D3, I1	**427**
13. 3.	**20:42**	165	D1	**0:57**	147	D3	**255**
14. 3.	**14:36**	1239	D1, I2	-	-	I0	
15. 3.			I0	**19:31**	-179	I3	**295**
16. 3.	**23:59**	362	D1	**4:43**	373	I3	**284**
17. 3.	**15:43**	-134		**22:55**	25	D3	**432**
18. 3.	**23:30**	333	I2	**5:05**	395	D3, I1	**335**
19. 3.	**23:34**	337	D1, I2	**4:41**	371	D3	**307**
20. 3.	**3:48**	591	I2	**7:34**	544		**226**
21. 3.	**0:16**	379	D1	**13:45**	915	D2	**809**
22. 3.	**23:51**	354	D1	**15:15**	1005	D3, I1	**924**
23. 3.	**21:17**	200	I2	**3:44**	314	I2	**387**
24. 3.	**23:35**	338	D1	**9:14**	644	D3, I2	**579**
25. 3.	**8:58**	901	D1, I2	**16:29**	719	D3, I2	**451**
26. 3.	-	-	D0	-	-	D0	-
27. 3.	**14:53**	1256	D1, I2	-	-	I0	-
28. 3.	-	-	I0	**23:59**	89	I3	**546**
29. 3.	**11:02**	1025	D1, I2	**16:31**	1079	I3	**329**
30. 3.	**3:19**	562	I2	**9:13**	643	I3	**354**
31. 3.	**20:27**	150	D1	**1:48**	198	D3	**322**

Notice: D - reasons on the part of the carrier
D0 - canceled train
D1 - delay on arrival in cross-border station
D2 - waiting for locomotive
D3 - decommissioning / refilling
I - on the side of the infrastructure manager
I0 - canceled train
I1 - waiting for the shift to be allowed
I2 - waiting for free track in cross-border station
I3 - waiting for departure

For the 47005 train in this cross-border station a total of 15 vehicles were removed in March 2018; due to the necessary decommissioning of cars and 1869 min. waiting for the shift to be enabled, and later executing it. Based on this, the average delay per train is **84 min. due to the decommissioning or refilling of cars and 60 min. to wait for shunting a train.**

Source: Technologie provozu vlaků v pohraničních přechodových stanicích a vliv na jízdní řád - diplomová práce 2018 – Bc. Martin Winkler (Univerzita Pardubice)

Problems in the cross-border station Chalupki in relation to traffic management and information transfer

Table 26- Passage of train 47005 in cross-border station Chalupki and reasons of disruption in 2018

		Reason		*delay*	*reason*	*stay in minutes*
Den	**Chałupki příj.** *(5:45 h.)*	**Důvod**	**Chałupki odj.** ***8:45 h.***	**Zpoždění (min.)**	**Důvod**	**Pobyt v PPS** *(180 min.)*
1. 3.	**23:37**	D1, I2	-	-	I0	-
2. 3.	-	I0	**11:32**	167	D3, I1	**715**
3. 3.	**4:15**		**12:19**	214	D3	**486**
4. 3.	**10:08**	D1, I2	**14:14**	329	I1, I3	**246**
5. 3.	-	D0	-	-	D0	-
6. 3.	**8:24**	D1	**17:17**	512	D3, I1	**533**
7. 3.	**4:00**		**18:58**	613	D3, I1	**898**
8. 3.	**2:55**		**14:59**	374	D3, I1	**724**
9. 3.	**15:09**	D1, I2	-	-	I0	-
10. 3.		I0	**14:00**	315	D3, I1	**1371**
11. 3.	**8:30**	D1	**15:04**	379	D2, D3	**574**
12. 3.	**0:15 (13.3.)**	D1, I2, I0	-	-	I0	-
13. 3.			**8:30**	-15		**495**
14. 3.	**10:23**	D1, I2	**16:22**	457	D3, I1	**359**
15. 3.	**23:30 (14.3.)**		**8:11**	-34	D3	**521**
16. 3.	**5:02**		**10:40**	115	I3	**338**
17. 3.	-	D0	-	-	D0	-
18. 3.	-	D0	-	-	D0	-
19. 3.	**10:36**	D1, I2	**20:56**	731	D3, I1, I3	**620**
20. 3.	**9:15**	I2	**22:44**	837	D3, I1, I3	**809**
21. 3.	**3:47**		**21:52**	787	D3, I1, I3	**1085**
22. 3.	-	D0	-	-	D0	-
23. 3.	-	D0	-	-	D0	-
24. 3.	-	D0	-	-	D0	-
25. 3.	**16:13**	D1, I2	**3:04**	1099	D3, I1, I3	**651**
26. 3.	-	D0	-	-	D0	-
27. 3.	-	D0	-	-	D0	-
28. 3.	**10:19**	I2	**15:53**	428	D3, I1, I3	**334**
29. 3.	**12:40**	I2	**23:30**	885	D3, I1, I3	**650**
30. 3.	-	D0	-	-	D0	-
31. 3.	-	D0	-	-	D0	-

Notice: D - reasons on the part of the carrier
D0 - canceled train
D1 - delay on arrival in cross-border station
D2 - waiting for locomotive
D3 - decommissioning / refilling

I - on the side of the infrastructure manager
I0 - canceled train
I1 - waiting for the shift to be allowed
I2 - waiting for free track in cross-border station
I3 - waiting for departure

In the monitored period, the train was canceled by the carrier in 10 cases (there was no burden for this train). In the period from 19 to 23 March 2018 the train movement was influenced by the lockout activity between the Chałupki railway station and Bohumín-Vrbice railway station. After the closure, the **situation with transit trains through this TSO continued to be critical - there was a congestion where the trains of the carriers were stabled in many stations in the Czech Republic and Poland and transport almost collapsed. Subsequent trains were canceled because there were no empty trainsets for loading in coal mines.**

Train stay at Chałupki railway station is considered **for 3 hours to carry out the technical check**, traction of the traction units and complete brake test, as the arrival of the train from Poland is not fixed and varies according to the allocated train path. In addition, in the column "Stay in PPS", a disproportionate increase of values can be observed due to **waiting for the shunting**. Any shift in the Chałupki railway station is problematic and time consuming (in hours).
Source: Technologie provozu vlaků v pohraničních přechodových stanicích a vliv na jízdní řád - diplomová práce 2018 – Bc. Martin Winkler (Univerzita Pardubice)

Problems in the border station Zebrzydowice in relation to traffic management and information transfer

- The station is larger in size and number of tracks than the railway station Petrovice u Karviné. In addition to the double-track electrified railway from Zabrzeg Czarnolesie to the Czech Republic, there is a single-track electrified railway line to Cieszyn. From it the railway line turns to the Český Těšín TSO used from the perspective of freight transport, especially in long-term closures. This railway line does not allow higher speeds even though it is electrified, therefore it is not used for capacity. From the point of view of the train's tracing, it is also a complication that when traveling from the inland of Poland, the **trains have to perform a turning point** at the Zebrzydowice railway station and the Český Těšín railway station. This complicates the passage of a train in terms of its overall travel time, adding the necessary stay at the stations where the locomotive must cross to the other end of the train.
- Requests for international train routes (comparison of SŽDC, PKP PLK and ÖBB Infrastruktur)
  PKP PLK issues Regulamin sieci, which is similar to the Declaration on the RIA Railroad. Deadlines are set for submitting applications to the annual timetable and for partial changes during the timetable. However, the terms of partial changes are not aligned with changes in timetables in neighboring states. This may cause the train to be guided on the SŽ network as part of the partial change of the JR in the regular train mode, but on the PKP PLK network an ad hoc train path is requested. In the case of an international train path, an ad hoc request is made from the Polish side for a path. This request is transferred to the relevant One Stop Shop (OSS), which handles the requests for international train paths sent. However, since it **cannot pair different data, it is necessary to communicate with a particular carrier** in both countries concerned. This difference must then be resolved between the rail operators.
  In case of extraordinary situations, each railway operator solves the situation separately and differently. The complication is the delay value, when the carrier has to submit a new path request, both for a regular train and for an ad hoc train.
- PKP PLK has its own independent independent train path numbering system. A train running eg from a port on the Baltic Sea is assigned a national number, which is six-digit. Upon arrival at PPS, the train is renumbered to an international route and under this new international number goes to its destination via several other European countries. The **applications that communicate train position information are not known to the Polish train numbering system and thus the train cannot usually be traced by freight forwarders or carriers**. The first information about such a train is usually generated only at the border station (PPS), when the train data is entered into the system of the neighboring railway operator (in this case SŽDC). This complicates, for example, the transmission of train position information, ie the movement of the consignment to the customer, but also

distorts the need to use the locomotive and the driver of a particular carrier for the train.

Figure 13 – example of assigning numbers to trains by operator SŽ (national 5 numbers, international 6 numbers)

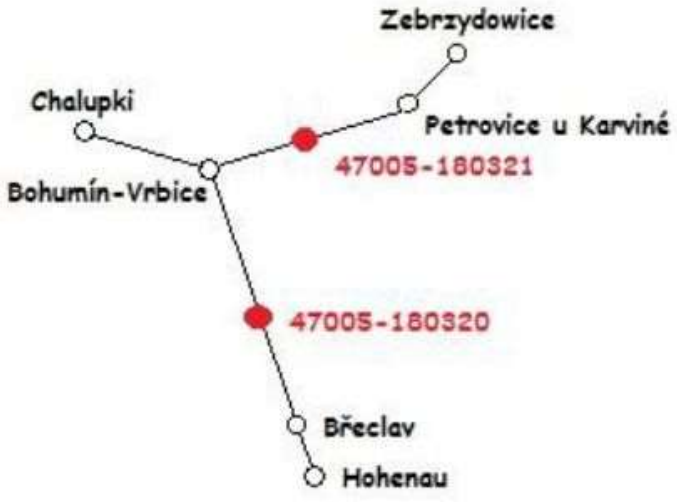


Table 27 - limiting values for the operation of the runway by the rail operators and their comparison.

	delay	In advance	request for an ad hoc route before the train is running	Cross-border station
SŽDC	+20h	-3 h	unlimited	Petrovice u Karviné, Bohumín-Vrbice, Břeclav
PKP PLK S. A.	+12 h	-	x-8 h	Chałupki, Zebrzydowice
ŐBB - Infrastruktur	+6 h	-6 h	unlimited	Hohenau

Table 28 – timetable for ordering train paths outside of annual schedule

Type of path	Date	
	From	Up to
international paths, multi-network paths or covered by a framework agreement		
Type of trains		
Freight, locomotions	25.3.2019	8.5.2019
Locomotions for freight transport	1.7. 2019	5.7.2019
One network paths		
Type of trains		
freight	27.5.2019	7.6.2019
Locomotions for freight transport	1.7.2019	5.7.2019
Individual paths for annual schedule		
Freight, locomotions	6.7.2019	16.9.2019

Conditions for ordering freight train paths in Poland according to Regulamin sieci

1. Applications for the allocation of train paths under IRJ may be submitted from 6 July 2019:
a) for domestic train routes at the latest: 5 working days before the planned departure of freight trains, non-commercial passenger trains, loose locomotives;
b) for international train routes that require agreement with foreign railway infrastructure managers, the applicant is obliged to submit via the ISZTP or OCTOPUS in the active part, through the PLK Railway Traffic Management Center appropriate for the border station, under the supervision of the One Stop Shop (OSS) cell , at the latest:
for freight trains and non-commercial passenger trains:
– 7 business days before the planned departure date for journeys using the network of a neighboring foreign railway infrastructure manager being a RNE member +2 working days for each subsequent railway infrastructure manager being a member of RNE;
– 20 business days before the planned departure date for journeys using the network of a neighboring foreign railway infrastructure manager who is not a RNE member or 25 business days before the planned commencement date of the journey using the network of more than one foreign railway infrastructure manager who is not a RNE member;
2. When submitting an application for train path allocation, the applicant who is not a carrier shall indicate the carrier who is to perform the journey, and the carrier shall be required to authorize the application within the time limits indicated above. The application without the carrier's authorization will not be forwarded to the timetable.
3. Whenever possible, PLK accepts the application for route allocation for a single journey after the deadline, however, the deadline for submitting the application must enable PLK to submit the developed train timetable project or to inform about the inability to complete the submitted application no later than two hours before starting the train.
4. If an application for route allocation under IRJ is submitted at least 72 hours in advance before the planned departure of the train, PLK guarantees that the developed IRJ or information about the inability to complete the submitted application is provided to the applicant no later than 36 hours after submitting the application.
5. PLK does not allocate capacity on an application submitted under the IRJ less than 6 hours before the planned start of the train or 3 hours in the case of applications for loose locomotive journeys.
6. Applications for route allocation under the IRJ for the period of validity of the RRJ (Annual Timetable) submitted within the time limit referred to in sub-chapter 4.3.1. paragraph. 1 (Annual Jada Schedule), PLK prepares and transfers the developed timetable to applicants from September 17, 2019 to September 23, 2019. In the case of an applicant who is not a carrier, the application should be authorized by the carrier indicated in the application by September 16, 2019 r. The application will not be submitted to the train timetable without the carrier's authorization.
7. Applications for route allocation under the IRJ with a running date from June 14, 2020 to December 12, 2020, submitted after January 24, 2020, PLK reviews after making available to applicants timetable changes (updated from June 14, 2020.), i.e. from March 6, 2020 to March 12, 2020. In the case of an applicant who is not a carrier, the application should be authorized by the carrier indicated in the application by March 5, 2020. The application will not be forwarded for the preparation of the timetable. train rides.

Applications for international trains - via ISZTP through the Center Zarządzenia Ruchem kolejowym PLK (CZRK) - Rail Traffic Control Centers supervised by One Stop Shop (OSS):

- 7 working days at the latest days before the scheduled departure date using the network of the neighboring infrastructure manager who is a member of RNE + 2 working days for each additional infrastructure manager that is a member of the RNE
- 20 working days at the latest days before the scheduled departure date using the network of a neighboring non - RNE infrastructure manager; or 25 working days using the network of more than one foreign infrastructure manager who is not a RNE member

2) The applicant submits a train path request and the carrier who will perform the transport must authorize the request. Otherwise, the RP will not be processed.
3) The application for the allocation of the train path after the deadlines specified in the Regulamin sieci within the individual timetable less than 3 days before the scheduled departure of the train guarantees the processing of the timetable or informs about the impossibility to provide the path no later than 36 hours from submission.
The PLK shall allocate capacity to the IRJ application no later than 8 hours before the scheduled departure of the train or 3 hours before the departure of the locomotive train.

Conditions for ordering freight train paths in Austria

In Austria, ÖBB-Infrastruktur allocates railway capacity on most railway lines, but is not the only railway operator. It also has deadlines for the submission of path requests in preparation for the annual JRC and its partial amendments under the Schienennetz-Nutzungsbedinungen 2019. Most of the change dates are again not aligned with the neighboring railway infrastructures. Ad hoc routes are accepted by the infrastructure manager through designated workplaces. It elaborates and assigns them according to prepared catalog routes. Routes are prepared without assigned train numbers and each carrier adds a train number from its given series to the allocated train path. This catalog is also used for delays of a regular train with a delay of more than 6 hours. In the case of a train with a head start, a maximum value of 6 hours is allowed.

Practical result of path ordering process in chapters up is:

Travel analysis of international trains 47001 (via Chałupki) and 47005 (via Petrovice u Karviné) and further via Břeclav to Linz Voestalpine
These are exemplary coal trains from Polish mines Rail Cargo Carrier - Czech Republic, s.r.o. - train 47005 is led at night time (at the time of saddle) through PPS Petrovice u K. and 47001 is led through PPS Chałupki during peak hours. The trains are getting in PPS Petrovice u K. and Chałupki and big delays, both for reasons on the part of the carrier and for reasons on the part of the infrastructure manager. These trains were statistically monitored in March 2018.

Figure 14 – timetables of trains 47001 and 47005 in 2018 on the route from Poland through the Czech Republic to Austria via cross-border station Bohumin-Vrbice and Petrovice u Karvine

Pn 47001 „KOLI"

Jede denně
Dopravce na síti PKP PLK: PKP Cargo, na síti ÖBB: RCA
Chałupki – Bohumín-Vrbice: 100 km/h – T_4 2000 t – 480m – 49 % – P – r 2 %
Bohumín-Vrbice – Hohenau: 100 km/h – T_4 2600 t – 650 m – 63 % - P – r 2 %

Stanice	Příjezd	Odjezd	Poznámky
Chałupki		8:45	**TP**
Bohumín-Vrbice	8:58	11:55	**manipulace, přepřah, TP***
Břeclav přednádraží	15:03	17:05	**osa, TP**
Hohenau	17:31	18:33	**přepřah, manipulace**
Linz Voestalpine	23:37		

* ode dne vyhlášení

Pn 47005 „PLKO"

Jede denně
Dopravce na síti PKP PLK: PKP Cargo, na síti ÖBB: RCA
Petrovice u Karviné – Bohumín-Vrbice: 100 km/h – T_4 2000 t – 480m – 63 % – P – r 2 %
Bohumín-Vrbice – Hohenau: 100 km/h – T_4 2600 t – 650 m – 63 % - P – r 2 %

Stanice	Příjezd	Odjezd	Poznámky
Zebrzydowice		17:43	
Petrovice u Karviné	17:57	22:30	**přepřah, TP**
Bohumín-Vrbice	23:03	2:35	**přepřah, manipulace, kropení soupravy, TP***
Břeclav přednádraží	4:56	7:08	**osa, TP**
Hohenau	7:33	8:14	**přepřah, manipulace**
Linz Voestalpine	14:49		

* ode dne vyhlášení

Translation:

Jede denně -	Goes daily
Dopravce na síti -	Carrier on the network
Manipulace, přepřah -	Handling, folding
Osa -	Axis
Ode dne vyhlášení -	From the day of publication

According to schedule, train 47001 has a prescribed stay at the Bohumín-Vrbice railway station at 2 h 57 min, at the Břeclav railway station at 2 h 2 min and at the Hohenau railway station at 1 h 2 min. This means that the total stay in cross-border station is about 6 h. The journey time from Chałupki to Bohumin is 10 min, from Bohumin to Břeclav it is 3 h 8 min, from Břeclav to Honenau 26 min and from Hohenau to Linz Voestalpine about 5 h 4 min. The total net travel time is 8 h 48 min.
According to schedule, train 47005 has a prescribed stay in the Petrovice u Karviné railway station 4 h 33 min, in Bohumín - Vrbice 3 h 32 min, in Břeclav 2 h 4 min. and in Hohenau 46 min. Total stay in cross-border station is about 10 h 55 min. Travel time from Zebrzydowice to Petrovice is 14 min, from Petrovice to Bohumín-Vrbice is 33 min, from Bohumín-Vrbice to Břeclav 2 h 21 min, from Břeclav to Hoheau 25 min, from Hohenau to Linz Voestalpine 6 h 35 min. The total net travel time is 9 h 43 min.

Problems in Poland cross-border stations

At railway border crossings, despite signed agreements, there are commonly delays reaching several or even several hours. Due to the lack of unambiguous information, average delays were estimated based on the interviews.

Table 29 – expected delays on Poland cross-border stations

Border station	Slovakia	Czech republic	Poland
Čadca	Minimal or none	Minimal or none	1-6 hours (even longer)
Skalité	Minimal or none	Minimal or none	Minimal or none
Petrovice u Karviné		1-6 hours (even longer)	Minimal (passenger) 1-6 hours (even longer) freight
Bohumín		Minimal or none (low transport current)	Minimal (passenger) 1-6 hours (even longer) (freight)

Problems in the cross-border stations Skalité and Zwardoń

The Skalité - Zwardon - Zywiec railway section is part of the pan - European corridor Gdansk - Warszawa - Zwardon - Cadca - Zilina. Railway border crossing Skalité - Zwardoň consists of border stations Skalité, Zwardoň. These are border stations, which are part of two lines, namely the route No. 129 Čadca - Skalité - Zwardoň in the territory of the Slovak Republic and the route No. 139 Katowice - Zywiec - Zvardoň in the territory of the PR. The Skalité - Zwardoň track section is single-track, electrified, powered by a 3kV DC traction system with a track gauge of 1435 mm. The owner and operator of railway infrastructure in the Slovak Republic is the state represented by Railways of the Slovak Republic (ŽSR). On the Polish side, they own the railway infrastructure of Polskie Koleje Panstwowe (PKP), where PKP is operated by Polskie Linie Kolejowe S.A. (PLK).
The computer networks of border crossing points are not interconnected, as a result of which trains are long at border crossing points. In such a case, the operational dispatcher of ŽSR, for example, must determine the train's position on the PKP network by telephone. The dispatchers of the railway station Skalité and the railway station Zwardoň shall immediately inform themselves of all facts that affect the provision and operation of the railway and the organization of transport on the border line. The border stations in question report the train delay by telephone for passenger trains of 5 min / larger and for freight trains of 60 min / larger.
ŽSR with PKP PLK S.A. Conclude a “Local Contract for Traffic Management and Organization of Railways on the Border Line and at the Border Stations Skalité (SR) - Zwardoň (PR)” with effect from 1 January 2010, which implies that train traffic planning is carried out by IDDE 4 Sosnowiec dispatcher; control dispatcher ŽSR OR, ORD Žilina. They shall agree to each other at the latest at 3.30 for the period from 6.01 to 12.00, 9.30 for the period from 12.01 to 18.00, 15.30 for the period from 18.01 to 24.00 and 21.30 for the period from 0.01 to 6.00 - for 6 hours accurate, for the next 6 hours prospective change plan. Planning includes established and revoked trains with carrier names.
At the same time, they are informed about the operational situation and about all extraordinary conditions in the train transport (consignments with exceeded loading rate, transport of dangerous goods (RID), supervised consignments, etc.). Only trains approved by the dispatcher IDDE 4 Sosnowiec and the control dispatcher ORD Žilina may operate

on the border line. Communication between the dispatcher IDDE 4 Sosnowiec and the control dispatcher ORD Žilina is carried out by electronic mail.
Due to the technical condition of the section Skalité - Zwardoň, there are routes for freight transport trains with a normative length of 300 m (Čadca - Skalité 650 m) in the GVD. For this reason, freight train processing technology is divided into two parts. From the direction of Čadca the trains in the railway station Skalité divide and from the direction of Zywiec they connect in the railway station Skalité. The following table shows the technological process of freight train processing in the SR-PR direction, where the train at the Skalité railway station ends (ending train) and two starting trains are assembled from the load.

Technology of freight train processing in cross-border station at direction Skalité – Zwardoň

Table 30 - Technological working time of freight train towards Slovakia – Poland, first half of train

No.	Act	Perfoms	Time	From-until
1.	Notification of train arrival	Dispatcher ŽSR	10	-10-5
2.	Expectations, tracking the train	Railcar serviceman ZSSK Cargo	5	-5-0
3.	Division of terminating train ISP	Agent ZSSK Cargo	10	-10-0
4.	Download of train documentation	Agent ZSSK Cargo	5	0-5
5.	Securing, splitting of train set, hanging engine	Shunter ZSSK Cargo	10	5-15
6.	Technical inspection	Railcar serviceman ZSSK Cargo	35	15-50
7.	Transport inspection, writing of the starting train inventory	Agent and spedition dispatcher ZSSK Cargo, agent PKP Cargo	30	15-45
8.	Creation of handover list	Agent ZSSK Cargo	5	45-50
9.	Processing of documents by PKP Cargo	Agent PKP Cargo	25	50-75
10.	Engine onset, brake test	Driver PKP Cargo, Railcar serviceman ZSSK Cargo	30	50-80
11.	Signature of the pick list	Agent ZSSK Cargo, Agent PKP Cargo	5	75-80
12.	Preparation of train documentation	Agent PKP Cargo	10	80-90
13.	Delivery of train documentation	Railcar serviceman ZSSK Cargo	5	90-95
14.	Train expedition	Dispatcher ŽSR	5	95-100
Total			100 min	

After the technological processing of the first half of train in cross-border Skalité, the wagons left after the split of the ending freight train (1300t / 600m) can be processed.

Table 31 - Technological working time of freight train towards Slovakia – Poland, second half of train

No.	Act	Perfoms	Time	From-until
1.	Technical inspection	Railcar serviceman ZSSK Cargo	35	0-35
2.	Transport inspection, writing of the starting train inventory	Agent and spedition dispatcher ZSSK Cargo, agent PKP Cargo	30	0-30
3.	Creation of handover list	Agent ZSSK Cargo	5	30-35
4.	Processing of documents by PKP Cargo	Agent PKP Cargo	25	36-6
5.	Engine onset, brake test	Driver PKP Cargo, Railcar serviceman ZSSK Cargo	30	36-65
6.	Signature of the pick list	Agent ZSSK Cargo, Agent PKP Cargo	5	60-65
7.	Preparation of train documentation	Agent PKP Cargo	10	65-75
8.	Delivery of train documentation	Railcar serviceman ZSSK Cargo	5	75-80
9.	Train expedition	Dispatcher ŽSR	5	80-85
Total			85 min	

Technology of freight train processing in cross-border station at direction Zwardoň – Skalité

After processing the train of the first train from the direction PR-SR in the railway station Skalité train is waiting for the second train, where the technology of processing the second terminating train consists of the technological processing of this terminating train and processing of the initial freight train towards Čadca.

Table 32 - Technological working time of freight train towards Poland – Slovakia and the starting train towards Čadca

No.	Act	Perfoms	Time	From-until
1.	Notification of train arrival	Dispatcher ŽSR	10	-10-5
2.	Expectations, tracking the train	Railcar serviceman ZSSK Cargo	5	-5-0
3.	Download of train documentation	Agent ZSSK Cargo	10	0-10
4.	Securing, splitting of train set, hanging engine	Shunter ZSSK Cargo	10	5-15
5.	Technical inspection	Railcar serviceman ZSSK Cargo	35	15-60
6.	Transport inspection, writing of the starting train inventory	Agent ZSSK Cargo, agent PKP Cargo	30	25-55
7.	Creation of handover list	Agent PKP Cargo	5	55-60
8.	Processing of documents by ZSSK Cargo	Agent ZSSK Cargo	25	60-85
9.	Signature of the pick list	Agent ZSSK Cargo, Agent PKP Cargo	5	85-90
10.	Engine onset, unlocking and hanging the train	Shunter ZSSK Cargo,	15	60-75
11.	Train list	ZSSK Cargo	15	90-105
12.	Brake test	Railcar serviceman ZSSK Cargo	35	75-110
13.	Preparation of train documentation	Forwarding disponent ZSSK Cargo	10	105-115
14.	Delivery of train documentation	Agent ZSSK Cargo	10	115-120
15.	Train expedition	Dispatcher ŽSR	5	120-125
Total			125 min	

The station track occupancy at the initial train line in the direction of Skalité - Čadca is 205 min. The total technological processing time of the train included the technological time of the first ending train and the processing time of the ending second freight train and the processing of the initial freight train.

The difference in technological times (PKP Cargo - ZSSK Cargo, ZSSK Cargo - PKP Cargo) is due to the length of the station tracks in the sections Zwardon - Zywiec. In the case of upgrading (extension of station tracks) of the Zwardoň, Sól and Wegierka Gorka railway stations and the Rajcza - Milowka railway section doubling, all trains would be assembled to a 650 m normative. For this reason, freight trains in the railway station in the direction Skalité - Zwardoň are divided and in the direction to Čadca again connected. In addition to the normative length of station tracks, the stay of freight trains at the Skalité railway station can prolong waiting for the propulsion of the locomotion, which results in unnecessary blockage of other station tracks, delays in passenger trains and others. ZSSK Cargo has concluded a contract with PKP Cargo on joint transport and cooperation of carriers at border crossing stations no. 1/2017, which shows that the technical (technical handover and acceptance of wagons) and transport inspection (handover and acceptance of consignments) in cross-border statio is based on the principle of mutual trust. The trains

will thus spend a minimum amount of time in the event of a locomotion replacement. Other tasks such as train listing and route orders are performed before the train arrives at the cross-border station from electronic or e-mail notifications (NL scan, wagon list).

Problems in the cross-border stations Čadca and Mosty u Jablunkova

The railway border crossing Čadca - Mosty u Jablunkova is formed by border stations Čadca, Mosty u Jablunkova. The Čadca - Mosty u Jablunkova border line is electrified, fed by a direct current traction system with a voltage of 3 kV, track gauge is 1435 mm. These are border stations, which are part of two lines, namely in the territory of the SR line no. 127 Žilina - Čadca - Mosty u Jablunkova and in the Czech Republic line No. 301A Čadca - Mosty u Jablunkova – Bohumín.
The owner and operator of the railway infrastructure in the Slovak Republic is the state represented by the Railways of the Slovak Republic (ŽSR). On the Czech side, the owner of the railway infrastructure is the state represented by the Railway Infrastructure Administration (SŽDC), which is also the rail operator.
For the management of traffic and the organization of traffic on the border line and at the border stations Čadca and Mosty u Jablunkova, a local convention was signed, which was concluded on the basis of the Agreement on Interconnection of Railway Infrastructures. This contract was concluded between SŽDC and ŽSR on 9 May 2011. An electronic exchange of information about anticipated train departures between GTN SŽDC and GTN ŽSR takes place between Návsí Návsí and Čadca. Electronic information exchange replaces telephone reporting and manual entry of this information.

The local convention implies:

- A condition for running a freight train on a section of a frontier line is that the border posts of both border stations are informed of the train composition (total number of wagons, train length, total train weight, traction vehicle series).
- The carrier is responsible for informing dispatchers
- The above information is displayed in the information system of the infrastructure manager. The dispatcher for local service of the railway station Mosty u Jablunkova (who does not have access to the information system) informs about the above mentioned data: the dispatcher of the railway station Návsí (for trains in the direction of ŽSR) and the internal dispatcher of the railway station Čadca (for trains in the direction of SŽDC). Dispatcher of railway station Návsí (railway station Mosty u Jablunkova) and internal dispatcher (railway operator) of railway station Čadca are immediately informed about all facts that have influence on traffic management and organization of traffic on the border line railway dispatcher.
- The train station and the internal dispatcher of the railway station Čadca inform themselves about the delays of trains in the IS. The dispatcher for the local service of the Mosty u Jablunkova railway station is delayed by passenger trains 10 minutes or more by telephone.
- Operational dispatcher SŽDC (Návsí) and ŽSR (Žilina) mutually approve the train plan / train change plan no later than 3.30, 9.30, 15.30 and 21.30 - 6 hours accurate, for the next 6 hours outlook train plan / change plan. At the same time, they are informed about all the extraordinary things in the train transport

(consignments with overloaded load, transport of dangerous goods (RID), consignments consigned etc.).

- The following table shows the technological time of operations in the PSC Čadca for the mixed train in the direction "SR-ČR" before the introduction of simplified handover of freight wagons. Simplified handover is performed on the basis of the Agreement on Cooperation in International Rail Freight Transport between ČD Cargo, a.s. and Railway Company Cargo Slovakia, as. The technological time of this type of train in the Slovakia – Czech republic direction is the same as when it takes place in the Czech republic - Slovakia direction.

Table 33- Technological working time of freight train towards Slovakia – Czech republic in cross-border station Čadca, train folded from 20 wagons loaded and 20 wagons unloaded – lenght 600m

No.	Act	Perfoms	Time	From-until
1.	Information about train arrival	Dispatcher ŽSR	10	-10-0
2.	Train ride	Designated employees	10	-10-0
3.	Securing, splitting of train set, hanging engine, brake test	Shunter ŽSR, Agent ZSSK Cargo	20	0-20
4.	Delivery of tickets from the train	Tranziter ŽSR	10	0-10
5.	Handover of transport documents to ČD	Tranziter ŽSR, Agent ČD	5	10-15
6.	Processing of transport documents	Agent ČD	15	15-30
7.	Transportation inspection	2 agenti ČD	40	20-50
8.	Creation of handover list	Agent ZSSK Cargo	10	30-40
9.	Signature of the pick list	Agent ZSSK Cargo, Agent ČD	5	50-55
10.	Preparation of train documentation	Agent ČD	15	45-60
11.	Delivery of transport documents and train documentation to locomotion	Agent ČD	10	60-70
12.	Train expedition	Dispatcher ŽSR	5	70-75
Agregate			75 min	

Within the programming period 2014-2020, the project "ŽSR, Modernization of the Czech / Slovak State Border Corridor - Čadca - Krásno nad Kysucou (outside), railway line" is included. The project will address the modernization of signaling and signaling equipment, modernization of railway track, overhead lines and electrical installations, platform construction, construction and reconstruction of railway bridges, culverts, subways as well as further modernization in order to increase reliability and safety of railway infrastructure. the attractiveness of the railways, to meet the requirements laid down in the international agreements AGC and AGTC. In the absence of implementation in the 2014-2020 programming period, it is assumed that the project in question will be moved to the next programming period. During the modernization of the Czech / Slovak - Border State - Čadca - Krásno nad Kysucou (outside) section, exclusions will be planned, resulting in longer stays of freight trains in the cross-border station.
ZSSK Cargo has "Interoperability" agreed with PKP Cargo and ČD Cargo.

Contracts for the joint transport and cooperation of carriers at border crossing points show the following:

- Technical inspection (handover and acceptance of wagons), transport inspection (handover and acceptance of consignments) in cross-border station are based on the principle of mutual trust. The trains will thus spend a minimum amount of time in the event of a replacement of the traction unit. Other tasks such as train listing and route orders are performed before the train arrives at the cross-border station from electronic or e-mail notifications (NL scan, wagon report),
- Technical trust has been agreed with RCA (Austria) and RCH (Hungary) for complete trains, where trains are handled without intermediate commercial and technical inspections.

Reasons for the duration of freight train journeys in cross-border station
The individual reasons (codes) for delays in freight trains are entered into the operational information system (PIS), which may be caused by infrastructure managers, railway undertakings, non-fault delays (external reasons, secondary delays).

The most common reasons for delays in cross-border station are:

- waiting for the traction unit
- late allocation of the train path to the carrier by the infrastructure manager (in the case of canceled trains, the application for path allocation)
- preparation (late delivery of wagons and accompanying documents, late provision of rolling stock or documents)
- delay caused by a previous carrier from a neighboring railway administration
- delays caused by the next carrier on a neighboring railway administration
- the delay caused by the previous infrastructure manager
- failure to late arrival of the driver, failure to observe technological times by the driver of the bus and others

5.7. Summary of the Chapter 5

Rail freight transport has many obstacles and limitations compared to road transport (lower network density, equipment of lines with safety equipment, number of tracks (electrified and non-electrified), train formation in marshalling yards, more problematic crossing of trains across national borders, locomotives in cross-border station or because of the transition from electrified to non-electrified track, replacement of drivers in cross-border station, etc.).
In terms of transport costs, the road can only compete with coherent trains that run regularly between two railway stations and do not need to be separated and reassembled either internally or internationally, especially over long distances. Furthermore, the transport of containers between container terminals inside or within Europe, from sea ports to the interior of Europe or export of finished cars from production plants to the whole world, etc. However, the introduction of new international container lines requires the cooperation of many entities from several countries (carriers, container operators, ports, logistics companies, etc.) and is more time-consuming and organizational than arranging transportation between two entities (road carrier and customer).

Freight transport by rail reaches lower speeds than road transport due to low line speeds (their sinks), limited line throughputs, priority of passenger transport, exclusions related to track reconstructions, delays in international trains in the cross-border station at the border between the Czech Republic and Poland due to the lack of cooperation of smaller carriers and their partners in another state regarding the timely delivery of locomotives for train yards and, if necessary, drivers' readiness, insufficient level of IS PKP PLK in terms of cross-border traffic management, different numbering of international trains on PKP PLK network and SŽ network, higher charges on PKP PLK network during the route over midnight (in 2 days); for freight trains (which prevail over the routes to the annual timetable) and long waiting times on the PKP PLK side before the train can be departed, unharmonised train paths on the SŽ and PKP PLK networks, etc. The biggest problems with the passage of international trains are in the cross-border station Petrovice u Karviné, because most trains from the SŽ network to Poland and trains from the ŽSR network through the Czech Republic to Poland pass through here. It does not have long enough tracks and some of them are not electrified. For these reasons, it will be reconstructed.
In terms of environmental impact, rail is clearly more environmentally friendly than road transport.
It is essential for the economic sense of long-distance rail transport to eliminate the legislative and organizational reasons that cause delays. On the Poland-Austria route, for example, the daily run may be increased by up to 30%, reducing the costs per tonne by 10 to 20% and falling below road transport costs.

6. POSSIBILITIES OF TRANSFER OF GOODS TO RAILWAY TRANSPORT FOR THE TRITIA REGION

6.1. Analysis of transport flows in railway transport for the Tritia region

CZECH REPUBLIC AND POLAND

Most freight trains run either on the Czech - Poland route (ie north - south) or Czech - Slovakia. Only a very small number of trains run across the territory of all three countries - Slovakia - Czech Republic - Poland.

DIRECTION CZECH REPUBLIC – POLAND (RUSSIA)

Across cross-border station Chałupki

Most international freight trains in the Czech Republic - Poland relations currently travel to and from Poland via the Chałupki and Bohumin-Vrbice cross-border station and then continue further south to other countries (Austria, Italy, Slovenia) or end up in the Czech Republic. Some international freight trains arrive in Poland, eg from Sweden (Ystad) via the port of Świnoujscie.

From Monfalcone in Italy, cars are transported via Poland and cross-border station Chałupki to Poland (to Gliwice) and also in the opposite direction from Poland (Swarzec) cars are transported through the Czech Republic, Austria to the port of Koper in Slovenia. Trains have a length of 500 - 600m.

Furthermore, coal from Poland transports through Chałupki - trains end in Ostrava hl.n. (length 600m, weight T4 2700 t). Target stations in Poland are Tarnowskie Góry, Rybnik, Slawieczyce, Świnoujscie, Gdańsk, etc.

Across cross-border station Petrovice

At present, a smaller number of trains run through the Petrovice u Karviná cross-border station with regard to lockout works on the Polish side.

Most of the international freight trains run from Poland (eg Zabrzeg) via Zebrzydowice and PPS Petrovice u Karviné to cross-border station Břeclav, from where they continue to Austria. Some trains from and to Poland start and end in the Ostrava region (at Ostrava hl.n. - about 10 Nex trains, Bohumin).

Two pairs of Pn trains run through Petrovice u K. to Slovakia to Čadca.

Cars from Škoda Auto, a.s. Mladá Boleslav to Poland (Małaszewice, Zabrzeg Czarnolesie, Jaworno Szczakowa, Sosnowiec). Trains have a length of 600m, weight S 1000 - 1200 t.

One Pn train runs from Zabrzeg Czarnolesie to Breclav and further to Austria.

From Petrovice u K. there are also Mn trains running to Karviná, Ostrava hl.n. and Třinec.

AWT, a.s., which is the largest carrier in the Ostrava region, operates through this PPS international trains to 3 different locations in Poland (8 pairs of trains per week) - trains from Poland to the Czech Republic carry mainly fuels (diesel and petrol).

A large number of wagons are also transported by container trains to Russia (to the destination Chernihivsk near Kaliningrad), where they transport containers containing unfolded KIA cars from Zilina (because of cost savings in Russia - the duty on finished cars is 40% of the car price).

The main sessions at the Paskov terminal are international trains, mostly with containers (but also double trailers), which run south (to Italy, Slovenia), where they terminate in the

ports of Trieste, Koper and are transferred to ships. These trains with intermodal trailers go from Turkey not only to Paskov, but also to Poland, Slovakia and Finland. Transport to ports in the south is developing due to the fact that the main ports for the entry of goods into Europe are congested (Rotterdam, Hamburg, etc.). Prospects are also considering trains to the port of Piraeus near Athens in Greece.

DIRECTION CZECH REPUBLIC - SLOVAKIA

Across cross-border station Mosty u Jablunkova

Freight trains that run from Slovakia via cross-border station Mosty u Jablunkova / Čadca mostly start or end in the Ostrava region (at the stations Ostrava hl.n., Bohumín, Třinec, on sidings down to the Karviná region, etc.). In the opposite direction to Slovakia mainly coal is transported from mines in the Ostrava region and also from Poland (Haniska pri Košicicach). Many Nex trains run from Čierne nad Tisou to Ostrava-Bartovice and vice versa (from Ostrava-Kunčice) they carry iron ore for Arcelor Mittal and Třinecké železárny (length 600m, weight 2500 t (loaded)). Other trains run between Žilina Teplička and Ostrava hl.n. (mining station - carries individual consignments also from Třinec) or Žilina Teplička and Ostrava – Bartovice carries limestone for Arcelor Mittal and Třinecké železárny) and Velké Kapušany and Ostrava - Bartovice (carries iron ore for Arcelor Mittal and Třinecké železárny).
One Pn train carries from Ostrava hl.n. via Komárno coke to Hungary.
r Mittal and also Třinecké železárny) and Velké Kapušany and Ostrava - Bartovice (carries iron ore for Arcelor Mittal and Třinecké železárny).
Container trains from the container terminal in Šenov u Havířova continue to Dunajská Streda near Bratislava.
At present (within GVD 2018/2019) only a few international freight trains travel from Slovakia through the territory of the Czech Republic (cross-border station Petrovice u Karviné) further to Poland (approx. 2-3 trains).
If there are large delays in freight trains on the main corridor (on line 305B) in the section Přerov - Ostrava due to outages, eg AWT, a.s. prefers the route of international trains that go further south (to Italy - port of Trieste, Slovenia - port of Koper) through the territory of Slovakia, ie. along the Čadca-Žilina-Bratislava corridor.
Also, in 2012 - 2023, lockout works are planned on line 305B in the sections Dětmarovice-Petrovice u K. - state. border, Polom - Suchodol nad Odrou and Lipník nad Bečvou - Drahotuše.

Czech republic– Germany (Italy, Slovenia)
Relations from Ostrava (from Paskov and Havířov terminals) in relation to Germany - are container trains from the maritime institutes of Hamburg, Bremen, Rotterdam and freight trains to Eichel Wanne hbf - (stations near the Herne terminal). There are few trains running from the Paskov terminal to the Bremenehafen port. AWT also started transporting a new intermodal line to the Verona Quadrante Europa terminal in Italy in 2012, but was terminated in July 2013 due to loss.
AWT operates regular trains to and from Mělník designed primarily for the needs of Maersk Line, which was subsequently followed by direct trains from the port of Bremerhaven (their operation was extended in 2013).
Since 2011, Paskov has also been connected to the ČD-DUSS Lovosice terminal - trains carry mainly intermodal trailers from Ewals Cargo Care.

Since January 2018, the regular LKW Walter semi-trailer line between Paskov and the German Herne terminal was launched at a frequency of 4 pairs a week. From the Herne terminal, shipments go to the Dortmund area and some trains continue to the Benelux.

Lines – container trains AWT:
Paskov – the port of Mělník and further to Germany (ports of Bremenhaven, Hamburg), containers
Paskov - the port of Mělník and further to Holland (port of Rotterdam), containers
Paskov - Herne (and possibly further to Benelux), transport of semi-trailers LKW Walter
Paskov - Trieste (Italy) and further to Poland, Slovakia, Finland), transport of containers and semi-trailers
Paskov - Koper (Slovenia), containers
Paskov - Chjenachovsk (Russia), containers
Paskov - terminal ČD-DUSS Lovosice (further to Germany), group of wagons with containers for complete trains to Germany
Paskov - Gdansk, containers

Perspective: Paskov - port Piraeus near Athens (Greece) – containers

The strongest relations with the largest volume of container cars transported were transports to Chernivtsi in Russia, ports abroad - Trieste, Koper Luka, Hamburg, Rotterdam, Bremenhaven, Gdansk (where the transports began to develop only in 2017) and to the Herne terminal in Germany.

AWT trains with coal, chemistry and fuel:
Paskov - Austria (coal trains)
Paskov - Hungary (coal trains)
Paskov - Poland (3 locations) - fuel, chemistry

Table 34 – AWT trains within TRITIA region in 2018

Realized trains				**Series of used engine**		
Destination	**Intenzity**	**Gross weight**	**Lenght**	**183**	**2x183**	**183 + 753.7**
Container trains						
Slovenia	6 pairs a week	1500	535		(x)	x
Germany	7 pairs a week	1700	650		(x)	x
Italy	3 pairs a week	1100	500	x		
Coal trains						
Inland	7 pairs a week	2400	400		x	
Austria	7 pairs a week	2000	351		x	
Hungary	4 pairs a week	2100	380		x	
Inland	1 pairs a week	2870	485	x		x
Fuel, chemistry						
Poland 1	3 pairs a week	1840	450			x
Poland 2	2 pairs a week	1840	450			x
Poland 3	3 pairs a week	1840	450			x

The strongest relations abroad in 2018:
port of Mělník on the Elbe - (further to the ports of Hamburg, Rotterdam, Bremenhaven - 3,143 railway wagons / year
Germany - (Wanne Eickel Hbf) near the KD Herne terminal- 3,301 railway wagons / year
Germany aggregate 6 444 cars/year

Russia - Chernjachovsk - 4 872 cars / year (unfolded railway wagons)
Italy - Port of Trieste - 4 600 cars / year
Slovenia - Koper luka - 3 658 cars / year (automobiles)
Poland - Port of Gdansk - 1 211 wagons / year (1 train / week)
Poland - Siechnice - 564 cars / year
Bremerhaven Nordhafen - 325 cars / year

Inland directions:
Melnik - 336 railway wagons / year
Pardubice hl.n. - 685 railway wagons / year
Ostrava-Kunčice _ 460 railway wagons / year
Ostrava center - 111 railway wagons / year
Lovosice - 159 railway wagons / year

ČD CARGO
ČD Cargo operates regular international trains across TRITIA region:
to Poland - to Małaszewic (24 hours) and further to / from Russia, Belarus, the Baltic, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan - both containers and conventional consignments, dangerous goods RID, transport of containers by rail or road not only in the Czech Republic, but also to Slovakia, Austria or Hungary).
They provide transhipment in Małaszewicz, Brest and other border stations, distribution of containers by rail or road not only in the Czech Republic, but also to Slovakia, Austria or Hungary).

to Slovenia on the route Breclav - Ljubljana Zalog - Koper (3 times a week, transport time 12 hours, to Koper 20 hours). It is a transport of wagon consignments with all kinds of goods, containers, dangerous goods RID, single. wagon shipments and groups of wagons. Dispersion of shipments from Ljubljana to Italy, Croatia, Bosnia and Herzegovina and from Břeclav to the Czech Republic, Poland and Slovakia.

to Romania on the Brno - Curtici route (3 times a week, travel time 18 hours). It concerns the transport of wagon consignments with all kinds of goods, including dangerous goods RID, transport of containers, swap bodies and road semitrailers. wagon consignments and groups of wagons. They provide dispersion of shipments from Curtica to other stations and from Brno to other stations not only in the Czech Republic.

to Hungary on the route Brno - Maloměřice - Budapest Soroksári út. (3 times a week, transport time 7 hours). Direct connection to combined transport terminals (Terminal Brno, BILK Budapest), dispersion of consignments in Hungary and the Czech Republic.

POSSIBILITIES OF POTENTIAL CROSS-BORDER STATION FOR FREIGHT TRAINS FROM TRITIA REGION

On the SŽ network, cross-border station **Petrovice u Karviné / Zebrzydowice**, **Bohumín-Vrbice / Chałupki**, occasionally **Český Těšín / Cieszyn**, **Mezilesí / Mieroszów** are used for international freight transport to Poland. In the direction of Slovakia **Mosty u Jablunkova / Cadca**, **Horni Lidec / Luky Mr. Makytou** and **Lanzhot / Kuty**.
In the direction of Austria, cross-border station **Břeclav / Hohenau** and in the direction of Germany, cross-border station **Děčín / Bad Schandau**.
It can be stated that border crossing stations situated on well-equipped lines ie. double track electrified is few. Especially at a time when extensive lockout operations are under way on many lines, there are no alternative options for crossing international borders through other cross-border stations linked to good parameters as an alternative for international freight trains. They are mostly monorail non-electrified tracks and in addition there may be problems with directional or slope conditions, low normative weight per axle, obsolete safety. equipment, etc.
On the border with Poland, for example, the Český Těšín railway station on the Polish side is connected to a single-track electrified line No.90 Zebrzydowice - Cieszyn.
Cross-border station **Jindřichov in Silesia / Glucholazy** is connected to a single unelectrified track and also cross-border station **Mikulovice / Glucholazy** - while driving from Mikulovice the track follows the river bed and for this reason there are large arches in front of Glucholazy.
Cross-border station **Meziměstí / Mieroszów** is connected on the Polish side to the single track 329 km long railway line, which runs from Wałbrzych and also passes through the Podlesie tunnel with a length of 262 m and there are many arches. Only the Boguszów Gorce Wschód - Meziměstí section is in operation, with the cross-border section now serving for freight and seasonal passenger trains to Adrspach.
In Slovakia, the main cross-border station with Poland is **Plaveč / Muszyna**. Its capacity is 15-20 trains / day. There is still a reserve for about 20 to 30 trains per day.
Another cross-border station between Slovakia and Poland is cross-border station **Medzilaborce-Lupkow**, which is minimally used for freight transport and only in the range of 1-4 trains / day. The capacity of the line can offer about 40 routes for freight trains.
On the border with Austria in the territory of Moravia, besides cross-border station **Břeclav**, there is also cross-border station **Znojmo / Retz**, which on the Austrian side is connected to a monorail electrified line and on the Czech side to a monorail non-electrified line. There are mainly passenger trains.

SLOVAKIA:

The development of the volume of transported goods in railway transport in the territory of the Slovak Republic generally has an increasing trend, while a certain periodicity of individual cycles is apparent. Based on statistical data, it can be stated that the volume of goods transported in the Slovak Republic during the reference period increased by 14.90% to 50 931 tonnes transported in 2018 during the reference period from 2010 onwards 17.55%.

Table 35 – Volume of goods in railway transport in Slovakia

Indicator	2010 (thousand tons)	2015 (thousand tons)	2016 (thousand tons)	2017 (thousand tons)	2018 (thousand tons)
Total transport of goods	44327	47358	50727	47790	50931
Domestic transport	6409	8055	6723	6369	6357
Import	17142	16010	16762	17332	18522
Export	11166	11743	13026	12857	12300

Tranzit	9610	11550	14216	11232	13752

ZSSK CARGO as the largest carrier in the Slovak Republic transported almost 34.4 mil. tons of goods, which represents a decrease of 1.3 mil. ton. ZSSK CARGO reported the biggest year-on-year increases in coal imports (+764 thousand tons). This increase was due to the fact that the company regained the transport of Czech coal for steel mills in Slovakia and in the import of wood (+134 thousand tons) for the Slovak paper industry. On the other hand, there was a year-on-year decrease in exports of metals (-319 thousand tons) due to decreased exports of metallurgical production by rail. Furthermore, the company recorded a year-on-year decrease in exports of petroleum products (-208 thousand tons) and in imports of petroleum products (-187 thousand tons).
The company also recorded a year-on-year decrease in the transport of railway ore (in transit -178 thousand tons, imports 174 thousand tons) for steel companies not only in the Slovak Republic, but also in neighboring countries (the reason was technical-operational problems on the side of which caused a decrease in import volumes of mainly iron ore to the SR with subsequent transit to the Czech Republic, Austria and Hungary). The following table shows the values of the goods transported by ZSSK CARGO product groups.

Table 36 – Freight transport by commodities ZSSK CARGO

Commodity	2010 (thousand tons)	2015 (thousand tons)	2016 (thousand tons)	2017 (thousand tons)	2018 (thousand tons)
Iron ore	12268	12497	12764	12533	12121
Coal	6422	4279	4674	4717	5123
Metals	5769	4906	5377	5204	4780
Bulding materials	3118	3307	3040	3621	3514
Petroleum products	2448	2312	2371	2415	2434
Wood	2154	2073	2696	2691	2307
Chemistry	2730	2563	2177	2201	1889
Intermodal transport	2779	1606	1434	1181	1175
Not specified	623	936	872	820	773
Foods	298	250	230	282	270

In 2017, ZSSK CARGO recorded an increase in transport in transit for metals (+121 thousand tonnes of south-north transport) and a decrease in iron ore (-489 thousand tonnes of transport for Czech steel mills).
From the geographical point of view, the position of the SR is particularly advantageous for transit traffic in the direction east-west as well as north-south and vice versa. Part of the Slovak railway network are important transport arteries of pan-European importance. The key corridors for ZSSK CARGO are:

- Gdynia - Ostrava/Žilina - Bratislava/Viedeň – Koper/Terst (Baltic - Adriatic Corridor);
- Praha – Wien/Bratislava – Budapest - Athens (Corridor Orient);
- Praha – Horní Lideč – Žilina – Košice – Čierna nad Tisou (Corridor Rhine - Danube).

The most frequent exchange of goods flows of international transport through border crossing stations was recorded by the company on the Slovak-Ukrainian border (in 2018 up to 40.1% of total international transport), which was caused by high volume of raw material transport for metallurgical industry (railway ore, coal and metals).). The transport of goods flows of international transport on the Slovak-Czech border reached almost 36.6% of the total international transport. At the input are mainly commodities coal, metals, petroleum products, intermodal transport, chemistry, building materials, at the output iron ore, building materials, chemistry metals, automotive and intermodal transport. The

following table shows the percentage of goods flows of ZSSK CARGO PPS with neighboring railways.

Table 37 – Percentage of ZSSK CARGO goods flows through border crossing stations with neighboring railways in 2018.

Indicator	2018 %
Poland	3,20
Czech republic	36,60
Austria	8,00
Hungary	12,10
Ukraine	40,10

Most international freight trains in the territory of Slovakia (within the territory of TRITIA) currently run through the border crossing station Čadca - Mosty u Jablunkova. The following table shows the values of the goods transported through the Čadca border crossing point for import, export and transit.

Table 38 – Railway transport of goods through the border crossing station Čadca

Indicator	2018 (tons)
Export	1 311 196,84
Import	3 435 047,20
Tranzit - output	5 205 865,25
Tranzit - input	1 214 585,15

ZSSK CARGO carries out the transport of goods by international lines. on transport of wood from Germany to Ruzomberok-Liskova, but also transport of coal from the Polish ports of Gdynia / Gdansk and Szczecin to Haniska near Kosice via PPS Plavec - Muszyna and transport of iron ore from the Croatian port of Bakar near Rijeka to Haniska near Kosice.
The following table shows the transport routes through the Čadca border crossing station by ZSSK CARGO according to the valid "Schedule book 106" with effect from 15 December 2019.

Table 39 – Transport flows of ZSSK CARGO through border crossing station Čadca

Relation	Type of train	Weight normative	Note
Bohumín-Vrbice CZ - Čadca - Kraľovany - Čierna nad Tisou	NEX	S 1200	
Čierna nad Tisou - Kraľovany - Čadca - Ostrava-Bartovice CZ	NEX	T4 2500	8 pairs a day
Dunaújváros HU - Púchov - Čadca - Ostrava hl.n. CZ	NEX	U4 800	1 pair
	Pn	T4 2300	
Haniska p.K. - Kraľovany - Čadca - Ostrava-Bartovice CZ	NEX	T4 2500	
Lisková - Kraľovany - Čadca - Petrovice u Karviné CZ	Pn	S 1700	1 pair excluding period from 23./24.XII. to 6./7.I. operate daily excluding 10./11.-13./14.IV..
	Pn	S 2400	
Ostrava báňské station CZ - Čadca - Žilina-Teplička	NEX	S 1600	2 trains a day; train excluding period from 24.XII. to 12.I. operate daily excluding 7 and no 11. and 13.IV; Train operate daily excluding

			24.,25.,31.XII., 1.,5.I., 11. a 12.IV.)
Ostrava hl.n. CZ - Čadca - Kraľovany - Haniska p.K.	NEX	T4 2500	
Ostrava hl.n. CZ - Čadca - Púchov - Štúrovo	Pn	T4 2200	
Ostrava-Kunčice CZ - Čadca - Kraľovany - Čierna nad Tisou	NEX	U4 1000	3 trains a day
Ostrava-Kunčice CZ - Čadca - Kraľovany - Veľké Kapušany	NEX	U4 1000 T4 2500	2 trains a day
Ostrava-Kunčice CZ - Čadca - Žilina-Teplička	NEX	U4 1000	
Petrovice u Karviné CZ - Čadca - Kraľovany - Haniska p.K.	NEX	T4 3200	
Zabrzeg Czarnolesie PL - Čadca - Žilina-Teplička	Pn	T4 1400	1 pair; train operate on 1,3,5 excluding 25.XII., 1.,6.I. and 13.IV..
Zebrzydowice PL - Čadca - Žilina-Teplička odch.sk.	NEX	S 700	Train operate from 1 to 5
Žilina-Teplička - Čadca - Ostrava-Bartovice CZ	NEX	T4 2500	1 train operate daily, second train operate on 3,5,7 excluding 15.XII..
Žilina-Teplička odch.sk. - Čadca - Ostrava báňské station CZ	NEX	S 1800	1 train operate excluding period from 24.XII. to 12.I. operate daily excluding 7 and no operate 11. and 13.IV..; Second train operate daily excluding 25.,26.XII., 1.,2.,6.I., 12. a 13.IV..
1-Monday; 2- Tuesday; 3- Wednesday; 4-Thursday; 5-Friday; 6-Saturday; 7-Sunday			

In addition to ZSSK CARGO, transportation via PPS Čadca is also carried out by other carriers. AWT Rail SK a. with. (AWTSK), RM Lines, and. s (RML), LTE Logistik and Transport, Slovakia, s.r.o. (LTE), Rail Cargo Carrier - Slovakia p. r. about. (RCCSK), CARBO RAIL, Ltd. (CRR). The following table shows the transport routes through the Čadca border crossing station by railway undertakings, according to the valid "Exercise Schedule 106" with effect from 15 December 2019.

Table 40 – Transport flows of other carriers through border crossing station Čadca

Relation	Type of train	Weight normative	Carrier/corridor	Note
Žilina zr.st. - Čadca - Zebrzydowice PL	NEX	S 1100 S 1000	RCCSK	1 pair
Catusa RO - Púchov - Čadca - Zdzieszowice PL	Pn	U 1000 T4 2400	LTESK	1 pair
Bánréve HU - Kraľovany - Čadca - Ostrava hl.n. CZ	Pn	T4 1700 T4 2000	CRR	1 pair (train operate on 3,5,7 excluding 15.XII. ; train operate on 1,3,5)
Bánréve HU - Vrútky - Čadca - Ostrava uhelné n. CZ	Pn	T4 2000	AWTSK	Train operate on 2, 4, 6
Ostrava uhelné n. CZ - Čadca - Vrútky - Sájoszentpéter HU	Pn	T4 2100		
Varín - Čadca - Řetenice CZ	NEX	T4 1000	RML	Train operate on 6
Čierna nad Tisou - Kraľovany - Čadca - Skalité	Pn	T4 1900		as needed; free path
Haniska p.K. - Kraľovany - Čadca	Pn	U 800	CRR	
Návsí CZ - Čadca - Kraľovany - Veľká Ida	NEX	T4 2500	RFC9	as needed

Čierna nad Tisou - Kraľovany - Čadca - Návsí CZ		T4 2500 S 1000		1 pair; as needed
Maťovce - Kraľovany - Čadca - Návsí CZ		T4 2500 U4 1000		as needed
Varín - Čadca - Návsí CZ		T4 2500 S 1000		
1-Pondelok; 2- Utorok; 3- Streda; 4-Štvrtok; 5-Piatok; 6-Sobota; 7-Nedeľa;				

There are no significant problems with the capacity (throughput) of track sections on the whole railway infrastructure of ŽSR. In the case of cross-border station it is about 75-79% of the train path permeability. The capacity utilization of lines in both directions together broken down into passenger trains, freight trains together with the indication of the remaining free capacity in the number of train paths is shown in the following table.

Table 41 – Railway Infrastructure Capacity 2020, Slovakia

Line No	Line section		Number of paths							
			Regular GVD		As needed		Free capacity		Capacity	
			even	odd	even	odd	even	odd	even	odd
160D	**Žilina - Čadca**	Passanger	36	35	2	4	43	57	123	136
		Freight	30	29	12	11				
	Čadca – Mosty u Jablunkova CZ	Passanger	22	22	0	0	75	79	126	132
		Freight	25	27	4	4				

The pricing system in place does not encourage railway undertakings to make fully realistic demands. At present, the charge for unused train paths is determined by each railway infrastructure manager separately. Railway undertakings order regular train paths which, in fact, are often not realized many times, with the consequence of renouncing trains and not utilizing railway infrastructure capacity. The following chart shows the development of realized train routes in the National Park in the Slovak Republic.

In terms of intermodal transport, the route from Žilina to Čadca is minimally used, as Slovak terminals use primarily Mediterranean ports and terminals in Western Europe, which are accessed by other railway crossings. A partial impact on this situation is also due to the high utilization of infrastructure in the Ostrava area and the selection of an alternative route, where there is less probability of disturbance of transport by passenger transport.

6.2. TEN-T corridors, transport takeover potential, traffic flow

The issue of the transfer of goods transport to more environmentally friendly modes of transport has been addressed in a number of documents referred to above by the EU institutions. This is similar to the national documents of the participating states.

Základní přepravní ramena v EZUS TRITIA:

Częstochowa – Žilina	239 km
Opole - Žilina	242 km
Opole – Katowice	113 km
Ostrava – Žilina	105 km
Ostrava – Katowice	95 km

It is clear from the above-mentioned basic transport directions that the transfer of costs from road to other modes of transport according to the intention of the European Union will be solved especially for traffic flows that cross the border of the TRITIA region. route over 300 km.

Due to the small size of Slovakia, domestic transport makes up a smaller part of the total output and is mostly transported under the regime of international transport or transit transport. Transport in the TRITIA region behaves similarly.

Table 42 – example of transport performance in railway transport in Slovakia (in thousands of tonnes)

Year	Import	Export	Tranzit	Inland	Agregate
2015	16 010	11 743	11 550	8 055	47 358
2016	16 762	13 026	14 216	6 723	50 727
2017	17 332	12 857	11 232	6 369	47 790
2018	18 522	12 300	13 752	6 357	50 931

Source: Štatistický úrad SR, DATAcube

In the future, it is expected that the new TEN-T corridors will be heavily loaded (with regard to their throughput) by new international trains, which will carry mainly goods in containers from container terminals. (Shuttle Trains).
The reasons for the demand for rail transport of certain goods in certain countries can be caused by eg legislation in the given country - for example, in Germany, Czech companies operating in intrernational container transport have to pay minimum drivers. national wage, which increases their shipping costs. Efforts to reduce these costs have led to the development of transports of double-trailer semi-trailers in pocket cars from the KD terminal in Paskov in the direction of the western outskirts of Germany (to pass a larger part of Germany).
Or these are high customs duties for a certain type of goods and the search for ways to pay lower taxes has triggered increased demand for the transport of passenger cars (disassembled in containers) on railway wagons towards Russia.
To some countries, rail transport is complicated by the different track gauge in neighboring states, which were originally intended to slow down the movement of enemy troops in the event of war. However, in peacetime, this necessitates transhipment and thus increases costs. Therefore, for example, on the route from the Czech Republic to Spain, there can be no comparable competition for road hauliers. The same applies to transports to Ukraine, where the political situation remains fragile.
It depends on how the state is able to respond flexibly by adopting the relevant laws to the situation.

Real possibility to transfer goods from road to rail
In the area of rail transport, the volume of combined transport has been increasing in recent years. It is also expected that the volume of KD transports will continue to grow. This is due to subsidies from EU funds in this area (from OP Transport) - to the construction of infrastructure (transhipment points), support for transhipment mechanisms, discounts on transport route charges. The railways are developing mainly in relation to international maritime transport in the context of international trade. In the moravian-silesian region, container trains end with containers (which arrive on container ships mostly from Asia) to the sea ports of Hamburg, Rotterdam, Bremen, etc.

Furthermore, comprehensive international trains, which consist of one type of wagon and transport one type of substrate between two places (shuttle trains), each located in different states, are economically advantageous. Because they do not require rework at the stations (reassembling and line-ups of new trains), they will meet the transport time required by the customer and this is reflected in a lower price. These must be long-term regular transports of large volumes (eg bulk substrates - from mines, quarries, fuel sources, etc.) or transport of various kinds of goods - products from production plants to customers. Lifts are usually equipped with mechanisms for loading and unloading of the given type of goods. Regarding the occasional (occasional) transport of goods, transport by rail encounters many problems - especially at the beginning and end section it is necessary to transport the goods to the loading station and reload them on the railway (which makes the transport more expensive). However, the prerequisite is that the destination stations are equipped with appropriate loading and unloading mechanisms, that the customer will have a suitable wagon delivered in time, the railway staff will be helpful and will provide timely and complete information on the transport (documents, price calculation, etc.).
Trains that are made up of individual wagon consignments and are demanding on marshalling processes and train formation ('collection trains') do not have a chance to compete with the pick-up service in truck transport.
New international train connections arise mainly from the initiatives of certain carriers operating internationally. rail freight and are looking for new opportunities to increase their performance. On the Czech market there are more carriers operating in this area, of which ČD Cargo, a.s. has the largest market share, but due to competition it sometimes loses some transports and is no longer a monopoly carrier. Other smaller carriers are associated in Žesnad to enforce changes in legislation and other areas in this field in order to improve the conditions for doing business in rail transport.
Road hauliers do not voluntarily give up their orders and do not transfer goods to rail. According to statistics, most goods between the Czech Republic and Poland and the Czech Republic and Slovakia are transported by road rather than by rail. Especially between the Czech Republic and Poland, the volume of goods transported in MKD increased by approximately 350% over the last 10 years (Poles travel mainly to Germany). In rail transport in the direction to Poland, train stays at the border crossing station Petrovice u Karviné are disproportionately extended, which means that these trains lose competitiveness in comparison with road transport (for details see chapter 5.6.3.

6.3. Very large and heavy shipments

These are consignments whose dimensions and weight exceed certain parameters. Nowadays, road transport is most used for transporting oversized cargo. Road transport has a wider passage profile than rail transport (eg double lanes). On the roads, this type of transport is also limited by many obstacles such as traffic signs and intersections at intersections, insufficient dimensions and construction of intersections (branch dimensions, roundabouts), tunnel height, underpass toll gates, etc. traffic on roads, so the transport is realized at night, when traffic is minimal.

Road transport - Czech republic
In Decree No. 341/2002 Coll., On approval of technical competence and technical conditions of operation of road vehicles on the road, as amended, the maximum permitted

dimensions of vehicles and combinations of vehicles, including cargo (§16) are stated:
maximum width: paragraph (2) of vehicles of categories M 2, M 3, N, O, OT, T is 2,55 m.

- maximum permitted height: paragraph 3) of vehicles of categories N3, O4 intended for the carriage of vehicles 4,20 m
- maximum allowed length:
  paragraph 7 - tractor unit with semi-trailer of 16,50 m,
  paragraph 8 - motor vehicle combinations with one 18,75 m,
  paragraph 9 - motor vehicle combinations with one O4 category trailer intended for the carriage of 20.75 m vehicles,
  paragraph 15 - sets of a self-propelled machine with a chassis for transporting work equipment of the machine 20.00 m
  paragraph 16 - sets with two trailers or with a trailer and one trailer 22,00 m.
- the maximum authorized mass of road vehicles must not exceed:
  paragraph j - of combinations of vehicles 48,00 t.

For example, the company Rádl, spol. s.r.o. as the only company in the Czech Republic has a parallel involvement of heavy low-loaders of the Goldhofer brand. Transports loads weighing up to 650 tonnes. In this way, they realized, for example, the transport of a turbine to Minsk, Belarus. They also provide combined transport.
They also use special hydraulic low loaders to transport heavy loads. They also have accessories - such as fifth wheel couplings - which enable fastening and transport of very long loads, located on two separate chassis.
They are equipped with 33 Goldhofer axles for the transport of the heaviest loads, as well as 6-axle, 5-axle, 4-axle and several 3-axle Goldhofer telescopic trailers, Faymonville. For transporting trolleybuses and buses, they are equipped with special low loaders with an approach angle of 4 °.
They use 15 (3-4-axis) MAN and Mercedes trucks to haul loads, most of which meet the EURO 6 emission standard.
Examples of transported loads:

- Special machinery (turbines, reactors)
- Steel structures (beams, bridge structures, girders, hubs)
- Transport of bulky tanks (beer tanks)
- Electrical equipment (generators, transformers, stators)
- Rail and track vehicles (trolley buses, buses, excavators)
- Others (coldboxes, dryers)
- In the spring-autumn period, also larger construction machines or cranes on special undercarriages are transported more by road to other sites of building construction.

Railway transport – Czech republic

The use of rail transport for oversized and heavy consignments is much more limited by the so-called passage profile of the line - this determines the maximum dimensions of the goods and railway equipment transported. This is a limitation of tunnels (height and width), platforms in stations or bridge capacities. Goods can not exceed 3 meters in height and width, the maximum length is up to 30 meters depending on the type of oversized pieces. The maximum weight is up to 200 tons when using special deep wagons. However, each carriage is assessed on a case-by-case basis and negotiated with each carrier along the transport route (for international transports, according to the number of countries in which the route is run). For oversized transports, both classic platform cars and special technology are used - multi-axle cars, low-floor and underground

cars. However, deep wagons have high purchase costs and are usually owned only by specialized companies.
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For very large and heavy consignments, rail transport is preferable to road transport in the possibility of using larger loading dimensions:

	Width	Lenght	Height	Weight
Semi - Trailer	2,5m	13,6m	2,7m	25 tun
Wagon	2,8m	20-25m	2,8m	54 tun

A massive transfer of oversized consignments from road to rail is thus not envisaged, and in practice it is not.

Waterway transport – Czech republic
It is also used for the transport of oversized consignments, but only to a limited extent. In recent years it is limited mainly by the weather ie. low water levels in rivers (also on the Elbe) due to climate changes and less rainfall, especially during the summer and especially the inability of the Czech Republic to perform the Děčín navigation level. Thus, in the future, it is not possible to envisage any larger transport of these consignments by water.
Some shipments due to size and weight can only be transported by water, in some cases even the production of certain parts of investment units is transferred to port territory, as transport from the factory would not be possible. The specialist for oversized cargo is Czech Ports with a transhipment point in the port of Mělník, from where shipments are directed mostly to sea ports. Unfortunately, the TRITIA region lacks a functional transport procedure for dispatching oversized consignments, for example, from the Opole port.

Road transport - Slovakia
Under the Road Act, excessive and oversized transport is subject to special use permit. Authorization is not required for vehicles of the armed forces, security forces and for the movement of agricultural machinery when carrying out agricultural work. Permission for special use for excessive and oversized transport is carried out according to technical conditions approved by the Ministry of Transport.
Excessive and oversized transport can significantly affect the condition of road infrastructure and the safety and smoothness of road traffic. For these reasons, in certain cases, an accompanying vehicle is required during the transport of oversized and oversized vehicles.
The technical regulation 'TP 103 Authorization procedure for the special use of

infrastructure for the carriage of oversized and oversized loads (and certain related selected obligations of the infrastructure managers and other entities)' distinguishes three weight categories of vehicles or combinations of vehicles:

- routes for carriage up to and including 40t;
- routes for carriage weighing 40-60 tons (inclusive) or with overall width up to and including 4,5 m;
- routes for carriage weighing 40-60 tons (inclusive) or with overall width up to and including 4,5 m.

TP 103 contains conditions and procedures for the authorization procedure for special use of roads in the transport of oversized and oversized cargo. According to technical regulation TP 103 the term special / exceptional carriage is carriage using vehicles performing oversized transport whose width exceeds 3 m or height exceeds 4,3 m or length exceeds 23 m including the transported cargo, or excessive transport where the vehicle or combination of vehicles exceeds 50.0 t. Such vehicles must be marked with a special informative sign on the front and rear of the vehicle to indicate special transport. For oversized transport pursuant to Act No. 135/1961 Coll. on Roads (Road Act) is considered such transport, where a vehicle or combination of vehicles exceeds one or more of the largest access dimensions specified in the Government Regulation no. 349/2009 Coll. on the maximum permissible dimensions of vehicles and combinations of vehicles, maximum permissible weights of vehicles and combinations of vehicles, other technical requirements for vehicles and combinations of vehicles in relation to weights and dimensions, and on the marking of vehicles and combinations of vehicles, as amended. The following tables show the maximum permissible dimensions by category of vehicles and combinations in the Slovak Republic.

Table 43 – Maximum permissible length of vehicles and combinations in Slovakia

Category of vehicle	Maximum permissible length
The trailer of a two-wheeled L-category vehicle shall not exceed the length of the towing vehicle	2,50 m
L_{1e}, L_{2e}, L_{3e}, L_{4e}, L_{5e}, L_{6e}, L_{7e}, L_S	4,00 m
M_1, N, O (except semi-trailers), T, C, P_S	12,00 m
Bus with two axles	13,50 m
Buses with three or more axles	15,00 m
Semi-trailer tractors	16,50 m
Articulated double-axle buses with three axles, single-trailer motor vehicles, category T or C tractor combinations with category R or S vehicles	18,75 m
Sets of a vehicle of category PS with a chassis for the transport of its work equipment	20,00 m
Motor vehicle combinations with one O4 category trailer intended for the carriage of vehicles	20,75 m
Motor vehicle sets with two semi-trailers, with two trailers or with a semi-trailer and one trailer, tractor sets of category T or C with two vehicles of category R	22,00 m

Source: TP 103, MDV SR

Table 44 – Maximum permissible width of vehicles and combinations in Slovakia

Category of vehicle	Maximum permissible width
L_{1e}, trailers for two - wheel motor vehicles	1,00 m
L_{2e}, L_{3e}, L_{4e}, L_{5e}, L_{6e}, L_{7e}, L_S	2,00 m
M_1, M_2, M_3, N a O (too T and C except of $T_{4.2}$ and $C_{4.2}$)	2,55 m
Isothermal vehicles of category N and O (usually DA superstructure isothermal)	2,60 m
($T_{4.2}$, $C_{4.2}$, R, S, P_S), P_n	3,00 m

Source TP 103, MDV SR

Table 45 – Maximum permissible height of vehicles and combinations in Slovakia

Category of vehicle	Maximum permissible height
L_{1e}, L_{2e}, L_{3e}, L_{4e}, L_{5e}, L_{6e}, L_{7e}, L_S	2,50 m
M, N, O, T, C, R, S, P_s	4,00 m
Semi-trailer tractor sets (vehicles of categories N3 and O4)	4,08 m
Vehicles of categories N3 and O4 intended for the transport of vehicles	4,20 m

Source: TP 103, MDV SR

If the vehicle or combination of vehicles exceeds one or more of the maximum accessible masses of vehicles or combinations of vehicles or the maximum permissible masses per axle referred to in Government Regulation No. 349/2009 is an over-carriage. The following table shows the permissible weights of vehicles and combinations in the Slovak Republic.

Table 46 – Maximum permissible weight of vehicles and combinations in Slovakia

Category of vehicle	Maximum permissible weight
Two-axle motor vehicles Two-axle trailers	18.0 t
Motor vehicles with two axles if the driving axle is fitted with a dual tire assembly and air suspension or suspension recognized as equivalent within the European Community (the vehicle must have a minimum axle load of 8 + 11,5 t) double-axle buses	19,5 t
Trailers with three axles	24.0 t
Motor vehicles with three axles	25,0 t
Motor vehicles with three axles if the driving axle is fitted with a dual tire mounting and air suspension or suspension recognized as equivalent within the European Communities or if each driving axle is fitted with a dual tire mounting and the maximum permissible mass per axle does not exceed 9,50 t	26,0 t
Two-axle articulated buses with three axles	28,0 t
Four-axle motor vehicles Trailers with four or more axles tracked vehicles	32,0 t
Two-articulated articulated buses with four or more axles	35,0 t
Motor vehicles with five or more axles of the combination	40,0 t
Combinations carrying transport containers in combined transport, combinations of tractor and maneuverable road semi-trailer in combined transport, combinations of vehicles with tank-container or swap body in combined transport	44,0 t

Source: TP 103, MDV SR

Pursuant to Section 8a of the Road Act No.135 / 1996, in the event that excessive traffic with a total weight of over 60 tonnes is to cross the railway at the track level, the applicant is obliged to request approval from the railway owner or operator for crossing. If oversized traffic above 4.5 m is to pass under the overhead contact line, the applicant shall request approval for crossing from the overhead contact, owner or operator of the overhead contact line.
An application for special use of infrastructure shall be made by the applicant to the competent road authority. An application for authorization for excessive and oversized shipments should include the following particulars:

- Applicant's data (if the carrier is not the same as the carrier);
- whether it is a single / repeated transport;
- type, weight of cargo;
- EVC, type, type and weight of vehicles to be used for carriage;
- data on the technical parameters of vehicles, including freight, to be used for transport (length, width, height, weight);

- wheelbase data for all axles and axle loads;
- the point of entry / exit to / from the SR;
- route design, maximum permitted speed during transport (route design via IS MCS);
- the certificate of registration of the vehicles to be used for the carriage, or the manufacturer's declaration of the vehicle parameters, if any;
- a outline drawing of the vehicles to be used for carriage indicating the overall length, width, wheelbase height of all axles and the load position;
- route design, maximum permitted speed during transportation (route design via IS MCS);
- assessment of the proposed transport route by the Slovak Road Administration, the Road Data Bank Department;
- the draft of the route prepared by the Slovak Road Administration, the Road Data Bank Department with requests for individual road managers, the agreement of the concerned road managers (in the case of motorways / expressways, consent for the transport of the National Motorway Company or the motorway / expressway manager);
- static checks of bridges;
- approval of the railway owner / operator;
- clearance for possible closures and bypasses.

After examining the application, the road authority, in agreement with the traffic inspectorate (assesses transport in terms of road safety and fluidity), issues a decision to the applicant / carrier on the special use of the road. The Road Data Bank (CDB) office suggests routes for carriage weighing 60 tonnes or more, or when the height exceeds 4.5 m. It comments on transport routes from 40 t to 60 t, which are determined by the transport company via the IS MCS web application.
In the case of oversize / oversize transport, which is simultaneously classified as a transport of dangerous goods, it is subject to the conditions of the ADR Agreement. When passing through a tunnel, the oversize / oversize transport of dangerous goods is carried as the only vehicle in the tunnel, subject to authorization by the tunnel manager.
The total volume of oversized transports in the territory of the Slovak Republic has a fluctuating character, as this type of transport is mostly irregular. The table below shows the development of the volume of oversized transports in the years 2010 - 2018 for the whole territory, due to the unavailability of data exclusively for the Žilina self-governing region.

Table 47 – Statistics on excessive and oversized shipments in 2010-2018

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total number of transports over 60 t	263	291	230	192	236	337	400	326	329
Total route length in km	42 003	49 608	35 416	26 453	28 991	34 913	82 419	61 843	97 588
Total tonnage in tonnes	25 406	26 828	22 270	19 484	21 676	35 840	36 904	27 898	29 719
Number of transports in import	72	117	61	67	67	118	143	144	148
Number of transports in export	60	82	53	27	27	46	80	75	107
Maximum total weight of the kit in t	616	490	424	426	434	287	402	270	439

Railway transport - Slovakia

A wagon consignment which, due to its external dimensions, weight or nature, causes special operational difficulties for the carrier is considered to be an extraordinary consignment in rail transport. In the case of tied wagons of wide gauge on railway lines

managed by ŽSR, transport is performed according to the principles applicable to the transport of extraordinary consignments. Such consignments shall be accepted for carriage only under specific technical or operational conditions, which must be agreed in advance by all railway undertakings / railways (MI).
For the transport of extraordinary consignments, the railway undertaking shall be governed by the provisions of UIC Regulations 502-1 and 502-2 and the ŽSR Regulations Z 7 and Z 1 (Articles 1330 - 1345) dealing with the negotiation of applications for consent for the extraordinary consignment. The UIC 502-1 is binding on all UIC railway undertakings involved in the international transport of extraordinary consignments and regulates the approval and authorization procedure in international transport. Special measures are laid down in UIC 502-2 for the coding of consignments exceeding the loading scale in accordance with the outline diagram. The contours can be found in the relevant decrees and, given their abundance, would be confusing and are therefore not included directly in this document.
According to UIC 502-1, the following are considered to be special shipments within the meaning of the CIM provisions and the UIC loading guidelines:

- shipments which are not seized in accordance with the UIC loading guidelines and for which the corresponding replacement measures have not yet been issued;
- consignments exceeding the minimum loading gauge specified for the line concerned involved in the carriage due to the loading width limits established under the UIC loading guidelines;
- fixed load units loaded on two wagons with swiveling / sliding swiveling: with the use of protective / intermediate wagons if applicable;
- Flexible loading units loaded on more than two wagons;
- freight wagons with more than 3 axles per chassis, provided they are loaded;
- Rolling Stock on own wheels not RIV / RIC or TEN marked (valid in EU Member States) or agreed marking (additional grid) in accordance with AVV;
- wagons whose load exceeds the permitted line load specified for the relevant line load category;
- laden wagons exceeding their maximum stated carrying capacity up to their maximum design carrying capacity, laden wagons with no indication of their permissible carrying capacity;
- vehicles on their own wheels not authorized by the MI, which can only be transported under special transport conditions and with specific approval.

The most common reasons for the classification of a wagon shipment among the extraordinary according to ZSSK Cargo:

- exceeding of loading rate;
- consignments requiring special measures in view of the position of the center of gravity of the load in order not to compromise the safety of operation;
- consignments that exceed the limit axle or bogie pivot length beyond the permitted limit;
- shipments of objects longer than 36m;
- rail vehicles on their own wheels (not marked RIV, RIC), rail vehicles coupled to 1435 mm, O-VM and 1-VM gauge and wagons without MC marking;
- Railway bogie wagons with pivoting spacing of 19 000 mm or more (empty / loaded).

The Railway enterprise sends requests for consent for the transport of an extraordinary consignment to the Transport Department of the ŽSR DG. An application for consent to transport an extraordinary shipment shall contain the following particulars:

- identification data of the applicant (carrier, transport);
- the type / type of wagon to be used for carriage;
- type, number of shipments;
- technical parameters of the wagon (Wheelbase / pivot distance, bogie wheelbase, number of axles, wagon length through bumpers, floor height and wagon weight, weight and load length;)
- in the case of a shipment exceeding the loading gauge - the contour dimensions of the shipment (width of the shipment from the track axis to the side, the height of the critical point above the top of the rail;
- three-dimensional positioning of the center of gravity;
- identification data of the consignor, carrier, consignee;
- proposed transport route;
- transport conditions (various technical, transport conditions, references to previous consents);
- dispatch station, destination station;
- type of transport;
- the anticipated date of submission of the consignment for carriage;
- other information on the consignment, which makes it possible to clarify the exceptional nature of the cargo, to lay down the conditions for securing it against deflection, overturning, falling, etc.

The applicant shall pay a fee according to the tariff for the consideration of any request for authorization to carry an extraordinary shipment, regardless of whether the shipment is carried out. For complicated shipment contours, the shipment scheme must be attached from three different perspectives, from which all the critical points of the shipment as well as the center of gravity must be apparent.
The statistics of railway transports do not define the category of oversized transports; one of the reasons may be the limited volume of these transports compared to bulk substrates, which form a larger transport performance on the ŽSR network.

6.4. Transfer of bulk materials transport on shorter sections than 300 km

6.4.1. Building materials

Czech republic
In general, for the construction industry, the transport of aggregates by lorry to buildings over distances of the order of more than 100 km from the quarry site is economically unprofitable. The price of aggregates ranges between CZK 200–300 per ton, while a truck typically has a lifting capacity of 28–30 tonnes. The current transport rates are around CZK 35 / km. The transport of aggregates purchased at a price of CZK 250 / t over a distance of 100 km represents 47% of the value at which the aggregate was purchased.
Building materials of the nature of bulk substrates such as cements, desulphurisation limestone, gravel and glass sands are usually transported by rail. Today, the distribution of building materials and materials to smaller beneficiaries is rather marginal. In the MSK region, ČD Cargo, a.s. Disc Štramberk or Cement Hranice. In connection with the reconstruction of tracks and stations, construction materials (gravel) are transported to the

excavation sites, debris and excavated soil are transported in Innofreight containers (term transports), rails, concrete sleepers and other building materials.

Slovakia

Under geological conditions, Slovakia has access to significant sources of materials used in the construction industry. Most of the quarries do not use railway transport for the transport of recovered material, the main reason being the local use, resulting from the wide coverage of the whole Slovakia by high-quality mineral resources used in the construction industry.

Table 48 – List of mining areas connected to railway transport in ŽSK

Location of the mining area	Conquered mineral	Connecting to railway
Horná Štubňa	Andezit	Without direct connection to the railway
Jablonové	Limestone	Without direct connection to the railway
Kraľovany – Bystrička	Granodiorit	Without direct connection to the railway
Lietavká Lúčka	Molten limestone	Own siding in lime
Liptovská Porúbka	Porfyrit	Without direct connection to the railway
Liptovské Kľačany	Limestone	Without direct connection to the railway
Lopušné Pažite	Gravel and sands	Without direct connection to the railway
Ludrová	Calc tuff	Without direct connection to the railway
Malá Bytča (Hrabové)	Gravel and sands	Without direct connection to the railway
Oravský Biely Potok	Sandstone	Without direct connection to the railway
Palúdzka – Liptovská Mara	Fillers	Without direct connection to the railway
Rajec	Dolomite	Hopper in railway station Rajec, import by road transport
Ružomberok I,II,III,IV	Dolomite	Without direct connection to the railway
Stráňavy – Polom	Dolomite, limestone	Own siding in the lime plant in Varín
Sučany	Fillers	Siding intended for the transport of precast concrete at the material processing site
Turie	Dolomite, limestone	Without direct connection to the railway
Veľká Čierna	Dolomite	Without direct connection to the railway
Vrícko	Limestone	Without direct connection to the railway
Vrútky – Dubná Skala	Granite	Without direct connection to the railway
Vrútky – Lipovec	Fillers	Without direct connection to the railway
Zuberec	Limestone	Without direct connection to the railway

From the mentioned mining areas, the quarries in Rajec, Lietava Lúčka and Stráňavy are important from the point of view of direct transport on the railway road. Of the above three, two (Rajec and Stráňava) carry regular transport of dolomite and limestone to Třinecké železárny, which is a distance shorter than 300 km, although in this case it is an international transport. The main reason for the use of rail transport is the volume of transported material that would unbearably load the road network on the axis Zilina - Cadca - Ostrava, which is already behind its maximum capacity, not to mention the load of a single road body transporting large volumes of aggregate with a high load the axle of the road vehicle.

A total of 50,931 thousand tons of goods were transported in Slovakia in 2018, of which approximately 10% were construction materials (distribution by volume of ZSSK Cargo Slovaki), which represents 5,093 thousand tons of material. In view of the general tracking of goods, it is not possible to define the precise direction of the goods flows and the

resulting transport distances and thus to define whether they were short or long sessions or the total transport distance of the goods flow under review.

6.4.2. Coal

Czech republic

Due to the decline in hard coal mining in the Moravian-Silesian Region, the volume of black coal imports from Poland is expected to increase in the coming years. According to calculations by the SEC (State Energy Policy), the highest rate of black coal imports would be achieved between 2020 and 2030, but imports will probably be very significant in later years as well.
In 2017, hard coal imports from Poland reached the level of 3 mil. tons.
Coal trains from Poland are operated by RCA (Rail Cargo Austria - a subsidiary of ÖBB) in the region and AWT (now PKP International, a.s.), a.s. i CD Cargo, a.s.

Slovakia

Coal mining is currently taking place only in the locality of Handlová, Cígeľ and Nováky. It is a cluster of mines located around the town of Prievidze, whose primary objective is to supply the Nováky thermal power plant. It follows from the above that there are no coal mines on the territory of the Žilina self-governing region and therefore it is not a source of this mineral wealth.
From the point of view of the direction to the Žilina self-governing region, heating plants, which also use coal combustion in their operation, may be the target, even though the selected heating plants are being upgraded to alternative (cleaner) heat sources. It is not possible to define the exact definition of the coal source for heating plants due to the unavailability of data.
At present, a large amount of coal is transported through the Žilina self-governing region in the east-west direction, whose sources are east of the Slovak Republic. Most of these volumes pass through Čadča cross-border station, as they are heavy whole trains that would have to be divided using the Skalité cross-border station.
ŹSSK Cargo Slovakia as the largest freight carrier in Slovakia transports 5 123 thousand tons of coal annually (for the year 2018), which represents approximately 15% of all its transport performance. In total, San and Slovakia transport 50,931 thousand tons of goods annually (data for 2018), applying the same commodity distribution as Cargo, which represents approximately 7,640 thousand tons of coal, which is largely transported through Žilina self-governing region as the route runs through it. from the east towards the Czech Republic and Poland.

6.4.3. Wood

Czech republic

In previous years, ČD Cargo, a.s. transported harvested wood from forests in the Czech Republic in common volumes from many loading sites on the entire network, which in time changed according to the places of harvest.
As a result of the bark beetle calamity, when the bark beetle overpopulated in Moravia and Silesia in 2015, transport of wood (logs) on the SŽDC network increased significantly. In 2016, the spreading of spruce stands in MSK began. Over 4 years of calamity (2014 - 2017), an unbelievable approximately 5 million m3 of wood was harvested in North Moravia. In 2016, 1.7 million m3 of wood was harvested in the Jeseníky Mountains.
The largest transporter of calamity wood is ČD Cargo, a.s. In the first four months of 2016,

twice as much wood was transported compared to 2015 (27,000 vehicles, 1.1 million tonnes of wood). Trying to simplify the transhipment of timber from road to rail, they began using large-capacity flatbed trucks with swap bodies.
Also IDS Cargo, the second largest timber transporter, had a 50% increase in the number of transports from January to May 2016 compared to the previous year. Wood is also transported by AWT, a.s.
All carriers are faced with a lack of wagons as well as insufficient capacity of regional lines and low capacity of loading stations, where such large volumes of transport were not envisaged. Within the TRITIA region, timber is transported within the Beskydy Mountains from the stations Lipník nad Bečvou, Hostašovice, Věřovice, Návsí and Jeseníky at the stations Milotice n. Opavou, Bruntál, Valšov and Dětřichov n. Bystřice.
Timber transport is being introduced on lines and stations where nothing has been loaded for many years, eg in May 2017 timber transport was also introduced on line No. 314 Opava East - Svobodné Heřmanice, which is provided by ČD Cargo, a.s. a pair of Mn trains.
In addition to domestic processors, calamitic timber is mainly transported to Germany, Austria and in recent years increasingly to Romania. IDS Cargo transports them to the Balkans as a transit from Poland. It has become a timber processor of European importance for Romania.
In addition to timber, timber and wood chips are also transported, usually Innofreight technology is used for its transport.

Slovakia

On the territory of the Žilina self-governing region there are important sources of wooden logs, which are mined and planted in regular cycles. Due to the high percentage of afforestation, there are a large number of points in the region where wood logs are loaded onto railway wagons. This is based on a long-standing tradition of the timber industry, which also seeks to minimize traffic on road infrastructure and maximize the use of rail transport as the main mode of transport. A large number of contact points are also based on a large number of business entities in the timber industry who are able to minimize handling costs in the case of a transhipment point operation.

Table 49– List of places on railway infrastructure where timber is transhipped to railway wagons

Line	Railway station
114 A	Rajec, Konská pri Rajci, Porúbka
114 C	Makov, Turzovka, Staškov
106 D	Krásno nad Kysucou
106 A	Dolný Hričov
118 A	Diviaky, Príbovce-Rakovo, Varín
113 A	Oravský Podzámok, Dlhá nad Oravou, Podbiel, Tvrdošín, Trstená
105 A	Ľubochňa, Liptovský Hrádok

The above table shows that the largest number of points of contact is in Orava, which is based on the geographical situation of the region, as the line runs in parallel with the Orava River in a narrow area surrounded by hilly terrain with extensive forest cover.
Transport of timber and associated production accounted for 2,307,000 tonnes for the largest haulier, which represents approximately 7% of the total volumes transported by the company in 2018. According to the Statistical Yearbook of the Statistical Office, it is not possible to define timber transport separately. Assuming a comparable distribution of the

total volume of overloaded ZSSK Cargo goods and the total volumes for all carriers, it is possible to roughly define that the total volume of timber transported is 6 111 thousand tons. From the statistics it is not possible to precisely define the division into domestic transport, import, export and transit, but it can be stated that most of the volumes go abroad, due to the small size of Slovakia and the resulting preference of road transport in domestic traffic.

6.4.4. Waste

From 2024, legislative measures will come into full force, making it practically impossible to landfill mixed municipal waste (MMW). Therefore, besides sorting and recycling, there is a high reliance on the treatment of energy-efficient waste (ZEVO) in modern environmentally friendly incineration plants.
The number of these incinerators is and will be relatively limited, which will necessitate concentration and subsequent collection of MMW to these locations.
According to data from the Czech Statistical Office, 3.6 million tonnes of municipal waste was produced in the Czech Republic in 2017, an increase of 7.3% compared to the previous year. On average, there were 339 kg of municipal waste per capita.
On the basis of the available data, it can be concluded that, on average, only 90 kg of these 339 kg have been recycled, 55 kg have been used in incineration plants and a total of 194 kg has been landfilled. This means that in the future period the volume of transported municipal waste will increase significantly on the route of household → transfer point → incineration plant. In particular, shipments from transhipment points (ie waste concentration points) to incinerators would create a relatively high burden on roads.
The TRITIA region has 7 885 000 inhabitants, which is about 1 775 000 tonnes of combustible waste per year.
In the area of rail transport, ČD Cargo, a.s. in the summer of 2017 pilot transport of municipal waste (3 rail cars of the Slps series with 9 ATCS containers with municipal waste) from Svitavy to the incinerator of the company SAKO in Brno (to the railway station Brno-Slatina). This company provides waste management services.
In the near future, the network of municipal waste collection lines to Brno should be expanded to include other cities. Many cities have no longer approved the extension of landfills and waste must be incinerated. ČD Cargo, as would like to use the experience of pilot transport of municipal waste also for other cities.

Slovakia
At present, waste is transported to a limited extent only by primary scrap metal scrap. The exact number cannot be defined as it is not kept in any publicly available statistics but is mostly included in other transported materials if the statistics are broken down by type of goods transported.
The only waste that is regularly transported by rail is nuclear waste, but it fits into the transport of hazardous waste and all the information associated with this transport is of a secret nature to ensure trouble-free transport throughout the territory of Slovakia.

6.5. Transfer of containers transport

Czech republic

Containers will play a key role in transport transfer, as existing technologies and existing terminals can be used, the network is dense enough to accommodate both cargo and unloading so that transport over 300 km can be done differently than on the road. Containers allow goods to be accessed by rail and waterways without direct connection to this infrastructure. Part A.T2.3 deals in more detail with intermodal and multimodal transport.

Containers are mainly used in international combined transport, namely in maritime transport between continents (Europe and Asia) and in combination with rail transport, which serves for the transport of containers by KD trains from sea ports (Rotterdam, Antwerp, Hamburg, Bremen etc.) to inland Europe - to KD terminals countries where trucks are delivered to end customers.

Thus, rail transport is mainly used for long distances (longer than 300 km) and road transport for short distances (within the collection and distribution of containers from the terminal to / from customers).

In relation to the Czech Republic, KD trains carrying containers (eg Metrans) provide connections between the ports of Hamburg, Bremen, Rotterdam with terminals in the Czech Republic (among themselves - between the terminal in Česká Třebová and Šenov u Havířova) with terminals in Slovakia.

It can only be said that the international transport of containers by rail has the greatest potential for growth in the future, as evidenced by the growing volume of traffic at the Paskov terminal (AWT) in relation to other ports in southern Europe or to Russia. AWT, a.s. (now PKP International, a.s.) tries to cooperate with KD operators and forwarding companies in different countries and to look for opportunities for the development of new container lines in the future.

Slovakia

The Zilina self-governing region currently has great potential in terms of the development of intermodal transport due to the opening of a new public terminal, which by its capacity can extend to the whole TRITIA region, where the main obstacle to development may be road infrastructure capacity in the Kysucky region. This is already inadequate and there are significant congestions in the towns of Čadca and Kysucké Nové Mesto due to the limited capacity of the current road network.

Table 50 – List of intermodal terminals in Žilinský sefgoverning region

Location	Mode	Operator	Public/private	TEU/year
Žilina	Railway/road	SKD Intrans, a.s.	Privateý	94 244
Žilina – Teplička	Railway/road	TIP Žilina	Public	-
Trstená	Railway/road	ZSSK, a.s.	Public	Mimo prevádzky
Ružomberok	Railway/road	ŽSR	Public	Mimo prevádzky

In the Žilina region, the most important terminal is located directly in Žilina, whose main outputs are containers intended for the KIA plant and the main source of containers is the port in Slovenian Copernicus, where the containers are reloaded from sea to rail. As the terminal is private and its capacities are fully utilized by containers directed to the local automotive industry, there is not enough capacity left to develop the region's wider

surroundings, but local load distribution is primarily carried out in the Žilina district. The terminal in Teplička has been open since February 2019 and there are no data on current regular sessions or on the performance and storage of containers in the concerned terminal.

Table 51 – List of development of transport volume in intermodal transport for 2015 to 2018

	Indicator	2015	2016	2017	2018
Number of containers	Domestic transport	36 228	32 250	31 601	32 516
	Export	156 831	160 421	155 895	181 721
	Import	155 471	164 263	152 602	182 925
	Tranzit	23 172	21 175	46 399	28 189
	Total number of containers	371 702	378 109	386 497	425 351
Weight of goods	Domestic transport	482,3	473,7	433,3	483,9
	Export	1 980,7	2 076,0	1 862,6	2 136,5
	Import	2 068,1	2 224,6	2 032,6	2 229,5
	Tranzit	2 60,5	2 48,6	671,8	406,6
	Total weight in tone	4 791,6	5 022,9	5 000,3	5 256,5

Statistical data is an expression of the fact that in Slovakia, intermodal transport is focused on export / inport resulting from the small size and expansion of major foreign investors who are focused on international trade. Transit may have an important position in the long term, when the eastern border of Slovakia is changing from wide to normal and can serve as a gateway on the China-Europe route, due to faster transport compared to water transport. Currently, the test operation is a regular interconnection of Slovakia with China, which is carried out once a week and one-way transport takes approximately two weeks. The transport is carried out to the terminal in Dunajská Streda, which, however, currently reaches the limit capacity due to the single-track line, which is connected to the remaining railway infrastructure and in the future the connection to the public terminal in Žilina may be more efficient. One of the main benefits may be to ease the road and rail infrastructure in large ports and to increase the overall efficiency of container transport for Central and Eastern Europe.

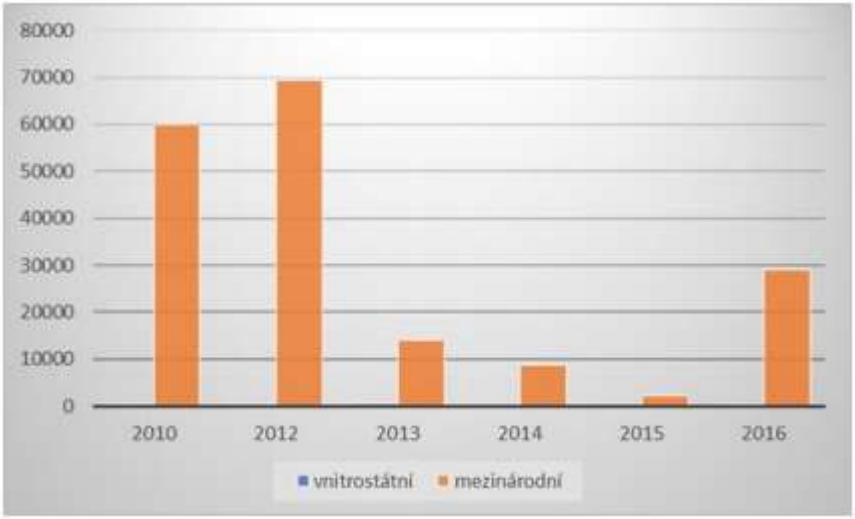
6.6. Swap bodies

The swap body is a modification of the container and, like the container, has unified technical parameters and dimensions. Some swap bodies are equipped with hinged and extendable support legs that allow handling without the need for additional equipment. A swap body has the advantage over containers of greater loading capacity and less weight with the same external dimensions. Another important advantage is its use in the form of a short-term warehouse. The use of swap bodies is of greatest importance in the realization of just-in-time deliveries.

The disadvantage of swap bodies is in most cases the impossibility of stacking on each other, which leads to the occupation of a larger area in the transhipment points or the fact that in the case of swap bodies without support legs it is

necessary to use a special gripping device for reloading. With the swap body it is possible to transport all kinds of commodities that are normally transported by road vehicles. They can be used in the transport of groupage goods, since it is not a problem to stop during transport and carry out partial filling or emptying of the swap body. They are divided into closed, open tarpaulin or without tarpaulin and tank. They are intended exclusively for continental continental road-rail transport. However, they are used only in conventional road transport in the vast quantities, but they are only partially used in combined transport.

Figure 15 – Graph of development of swap bodies transport by rail in Czech republic (thous. Tkm)



Inland International

Source: MD 2016

6.7. Double semi-trailers

Czech republic

The double-trailer system is one of the latest technology regularly used in combined transport, consisting of two separable parts - a structurally designed road trailer and a special railway chassis with an adapter. This modified road trailer in conjunction with the tractor forms a combination, in the case of connection with the railway undercarriage forms a wagon. They have experience from partial practical operations in Norway, Switzerland and Germany. In the Czech Republic, AWT, a.s.

For transport are required special pocket cars, which AWT, a.s. rented. The reason for the development of this type of transport in the Paskov terminal was an increase in the minimum wage of truck drivers in Germany.

Slovakia

The subject of IUC 597 OR Decree is the unification of characteristics for combined rail-road transport in the double-trailer system and the introduction of the system for international transport. The double-trailer semi-trailer transport system includes 1, 2 or 3 public road transport axle semi-trailers (frame, lorry, tipper and special types), the mobile equipment of which is equipped with an attachment specific to the system. It is a transport of road semi-trailers with a complete undercarriage up to a maximum width of 260 cm, height 4 m and length 13.6 m according to ECE regulations. - pocket wagon (saddle - pocket is a depression in the wagon, in which the part with rear axles and support legs is

inserted). According to UIC Decree No.520 and 526-1, end bogie adapters, unlike intermediate bogies, must be equipped with impact and draw gear and, if possible, of the same type.
Special wagons with platform or flat wagons are used within the double-trailer transport system. In the deployment phase, it is advisable to adapt the semi-trailers also for transport on pocket wagons, provided that this would not create any disadvantages for the double-semi-trailer system. Loading / unloading is carried out using a crane or pick-up equipped with ticks. The disadvantage of this system is that the superstructures are not stackable and require larger storage areas at the combined transport transshipment points. There is no known information available that carriers in the Slovak Republic carry out this kind of double-trailer transport system.

6.8. RO-LA

Czech republic
Within the RO-LA system, the transport units consist of trucks or road vehicles, which do not have any special structural elements or modifications, and within KD, they must meet only the permitted dimensions and parameters for rail transport. Special low-floor rail wagons are combined into a set. Under Ro-La reloading, transhipment takes place in a horizontal direction - vehicles approach the train and descend from the train at the front of the train.
The RO-LA system reached its greatest boom in the 1990s and at the turn of the 20th and 21st centuries, when carriers perceived the benefits of this system in minimizing downtime that hampered road freight vehicles at border crossing points as in the case of the significant Lovosice - Dresden line. With the accession of the Czech Republic to the European Union in 2004 and the entry into the 2007 Schengen area, entry permits and customs controls at the border have been eliminated, causing a sharp fall in demand for Ro-La and other accompanying combined transport systems. The Lovosice - Dresden line was canceled in 2004 due to their deep loss rate and the consequent permanent high demands on state operating subsidies. Operation was started due to an overloaded crossing to Cínovec in September 1994. From Lovosice to Dresden, RLa trucks traveled for 10 years. By the end of May 2004, a total of 833 057 trucks traveled by rail. Thanks to this, environmentalists also considered it.
RO-LA trains were largely subsidized by Saxony, as driver fees did not cover its costs.

Slovakia
The road transport system is a simple mode of transport and its positive feature is that it is environmentally friendly, as a large number of road transports are possible by rail. The reduced number of road trains on the road creates a precondition for safer and smoother road transport. The enormous increase in road trains results not only in congestion and wear of roads but also in a deterioration of the traffic safety situation of citizens, a higher concentration of air pollutants, dust and noise. Special multi-axle wagons (8, 10 and 20), such as the Saadkms, Saadlgs series, have a low floor height (400mm) within the ROLA transport system. The disadvantage of these wagons is their high maintenance costs, which are reflected in operating costs due to the high car rental charges. In rail transport, the prices of transport - tariffs always depend on the gross weight, that is, the weight of the load and the load unit into which the load is loaded. Since the freight unit in this case is a road freight train, the gross weight is decisive in determining the transport price.

Using this system, trains are assembled as straight trains. On the ŽSR railways, this transport system was implemented between 1998 and 1999 on the Nové Zámky sections towards ÖBB Wells and back. Thus, 184 rides (814 road trains) were carried out in one year. A year later, road trains together with crews transported a special train from 23.07.2000 to 01.11. 2000 three times a week on the Budapest Józsefváros - Gliwice Kontenerowa route. At that time, 52 trains carried 184 trucks and 851 semi-trailers.
There have been several attempts to implement the RO-LA system in Slovakia. One of them was the year 2002, where a regular integrated train was introduced in the directions of Budafok Haros - Trstená and Trstená - Budafok Haros via the border crossing station Komárom / Komárno. The reason for introducing the trains to the Trstená station was the border crossing Trstená because of the utilization of road infrastructure, especially the Šahy - Trstená route.
The last known effort was to introduce trains in the ROLA transport system from May 2008, which were supposed to operate daily in the morning from Trstena to Bratislava and in the afternoon back (there were 17 trucks in one train). Previously, in 2004, a test run of the ROLA train was carried out, which went from Romania to Slovakia through the border crossing Komárom (MÁV) - Komárno despite several attempts, the ROLA transport system did not take place, mainly for economic reasons.
The enlargement of the European Union to include several countries of Central and Eastern Europe also had a negative impact on the expansion of the ROLA transport system. Previously, passport controls and customs searches of road trains were carried out at national borders, which required some time spent at border crossing points. As customs controls have ceased to be carried out at the EU's internal borders, the reasons for which the ROLA system might be of interest to carriers have also disappeared.
In the case of the ROLA routes across the Alps between Austria, Switzerland, Germany, Italy and France, these routes are generally subsidized for the protection of nature and tourism, as the participating countries are not interested in road traffic crossing mountain passes and saddles. For the participating countries, the benefits of tourism are so high that they are justified in order to protect mountain passes and saddles.

6.9. Transport between large companies

Czech republic
Supplying large companies - ie. the transport of materials and certain components needed for the production of certain goods from subcontractors is mostly carried out by road MKD, as they are mostly goods delivered on time (just in time), which must be available for production within a precisely defined time. These are mostly goods on pallets, some chemicals can also be in barrels or other containers. New modern manufacturing companies (eg in the area of car parts production) have warehouses designed only for stocks that go into production immediately and have problems in the event of a failure or delay in the delivery of any materials or components because they have to adapt the production plan operatively. For this reason, it is not possible to assume the transfer of larger volumes of goods to a railway which is not reliable over time (especially in recent years, when many track closures are taking place). The railway is used, for example, only for the transport of sheet metal coils for the production of car bodies and especially for the transport of finished cars to iron. vehicles (or unfolded in containers) to customers in Europe, Western Asia (Russia) or overseas.

As already mentioned in other chapters, transport by rail is used for certain types of raw materials and products in large volumes and also over longer distances where it is not necessary to keep the exact time. These are raw materials and products that are specific in nature - for example, bulk substrates from the extraction site, either to raw material processors (eg iron ore, cement, diesel for gasoline processing) or directly to businesses that need them for the manufacture of certain products. Some products due to their high weight are more suitable for transport by rail, such as metallurgical products, iron products, etc. They cannot be transported by road where the weight is limited in order not to damage the roads too much.

Slovakia

On the territory of Žilinský selfgoverning region there are several large companies that use railway transport for transport to and from production.

The largest manufacturing plant is KIA, which imports various parts of cars by rail, including intermodal containers fed from the port of Koper, which are subsequently relocated at the Žilina terminal. Finished goods are exported by rail in two ways, either by transporting finished cars to railway wagons, or as disassembled components loaded in containers that are outside the Schengen area. Some of the cars produced are transported by road, depending on the destination of the car delivery.

Metsä Tissue (pulp mill) transports its products by means of railway wagons, which it loads on its own siding connected directly to the railway station of the Žilina station. These are regular shipments that go abroad.

Dolvap transports dolomite and limestone on regular trains to metallurgical plants in Moravia. Dolomite is loaded through a hopper at the Rajec and limestone stations, respectively, products from limestone are loaded directly from the production line via a hopper directly into the wagon on its own siding at the Varín station. The company disposes of modern equipment which provides minimal pollution of the environment together with ensuring the highest quality of produced products.

Timber is loaded in a large number of places in the Žilina self-governing region, primarily on a general loading and unloading track, which usually contains space for the temporary storage of material brought by road transport before loading on railway wagons. The reason for the large number of loading sites is the minimization of transport costs by road transport and the large number of businesses involved in the timber trade.

A list of all active siding connections and their operators can be found in Section 7.8 along with the definition of the operator's focus. From the above table it is possible to find out what commodities are exported from ŽSK, as most of the output exported by rail transport is exported due to short transport distances in Slovakia.

Within the Žilina region, there is currently a great potential for changing the transport mode in favor of rail transport through the transport of intermodal units. This potential is based on the operation of the public terminal by an operator with a wide experience of terminal operation in Dunajská Streda. The actual impact of the terminal cannot be precisely defined at present due to the unavailability of data for 2019, when the terminal was in operation for 10 months. The terminal currently has a storage area expansion plan, making the use of the terminal in question more attractive.

6.10. Mail and e-shops

Czech republic

Czech Post, s. e. Transports consignments (parcels, letters) by rail, especially at night. These are special trains with covered wagons (allowing higher speeds than conventional freight trains), which run within the MSK region from Ostrava hl.n. all the way to Prague - Malešice, where the main logistics hub is located, equipped with automated systems that sort the shipments. Established in 1992, it is the largest similar post office facility in the Czech Republic. It can handle fifty thousand packages from e-shops and 100 thousand packages of individual customers daily. These regular trains have been operating for many years and have proved their worth in operation.

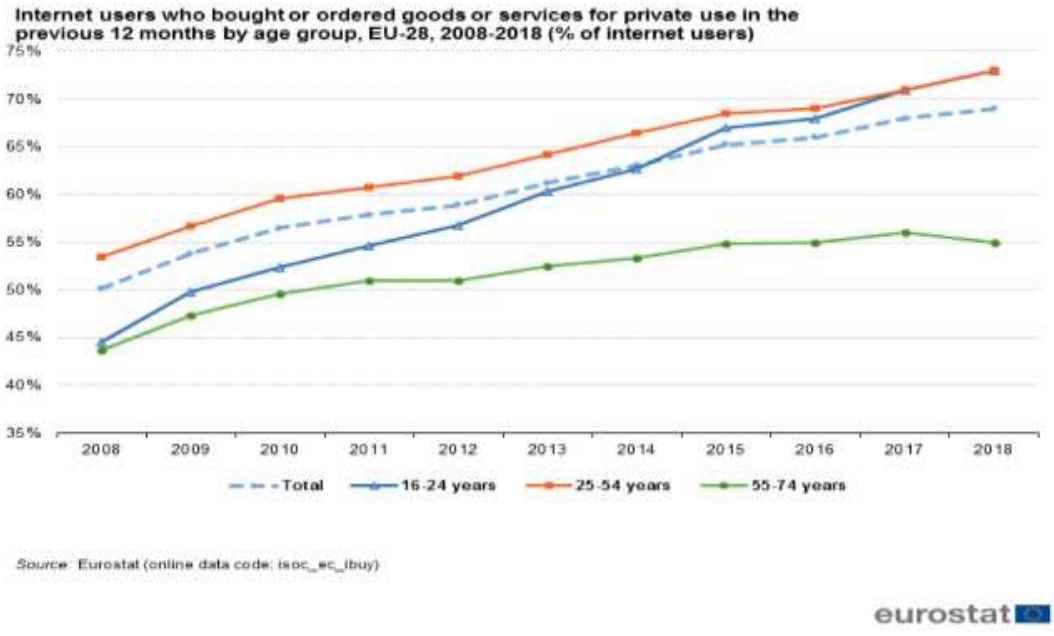
In the field of parcel transport, other companies that compete with the Czech Post, a.s. mainly price, delivery time, reliability, etc. (PPL Ltd., DHL Express, DPD CZ, Geis Parcel CZ Ltd., TNT, PLS etc.)

Regarding e-shops and distribution of consumer goods (electronics, clothing, etc.) to customers based on their orders (mostly realized via the Internet), there are many companies on the market that have their logistic warehouses in the Czech Republic (which supply trucks) and they also provide transport of various types of consignments mostly by delivery to the house (one of the most successful is eg Mall CZ). Depending on the place of delivery of goods, they are able to optimize their routes and ensure reliability, delivery time, and also cost-effectiveness, thanks to the software, which is often more advantageous than Czech Post, s.e.

Steady growth is recorded by e-shops, which are currently doing business within the state and due to payment conditions, it is usually not advantageous to run e-shops in cross-border mode. In the future, however, together with the unification of the European currency, it can be assumed that cross-border transactions will increase, and thus the transport of more orders over longer distances.

Another factor is that the internet is used more by younger people. With the passing of older years, the share of online shops compared to classic will increase.

Figure 16 – Growth of internet usage according to age of user



Slovakia

Postal services in accordance with Act No. 324/2011 Coll., On Postal Services and on amendments to certain acts, are services provided for the purpose of delivering a postal item, namely the collection and distribution of a postal item.

In this case, the postal item is a written notification or another thing to be delivered to the addressee, which is indicated by the addressee, is:

- letter-post, (correspondence, direct mail and blind)
- package, A periodic shipment; or
- postal order.

Any entity wishing to act as a postal undertaking providing postal services is required to be registered in the list of the Office for the Regulation of Electronic Communications and Postal Services (State Supervision and Regulatory Authority). The Postal Undertakings Register is a public list of postal undertakings which provide postal services under the law and which have been registered under this law. The register shall contain all relevant data on the postal undertaking by law.

Railway Company Slovakia (ZSSK) as a railway carrier in addition to its main activity, which is passenger transport and transportation, as a registered postal company, receives, transports and delivers letter and parcel postal items to its contractual partners. These delivery services are available at 17 railway stations from Bratislava to Humenné.

Table 52 – Railway stations with service available

From	To
Banská Bystrica	Bratislava, Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Lučenec, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Bratislava	Banská Bystrica, Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Lučenec, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Čadca	Banská Bystrica, Bratislava hl.st, Košice, Liptovský Mikuláš, Poprad Tatry, Ružomberok; Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen os. st., Žilina
Humenné	Bratislava hl.st, Košice, Liptovský Mikuláš, Lučenec, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Košice	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Levice, Liptovský Mikuláš, Lučenec, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen os. st., Žilina
Levice	Banská Bystrica, Bratislava hl.st., Humenné, Košice, Lučenec, Michalovce, Vrútky, Zvolen os. st., Žilina
Liptovský Mikuláš	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Lučenec	Banská Bystrica, Bratislava hl. st., Humenné, Košice, Levice, Michalovce, Zvolen os. st., Žilina
Michalovce	Bratislava hl.st., Humenné, Košice, Liptovský Mikuláš, Lučenec, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Poprad Tatry	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Liptovský Mikuláš, Michalovce, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Ružomberok	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Liptovský Mikuláš, Michalovce, Poprad Tatry, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Spišská Nová Ves	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Liptovský Mikuláš, Michalovce, Poprad Tatry, Ružomberok, Trenčín, Trnava, Vrútky, Zvolen, Žilina
Trenčín	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trnava, Vrútky, Zvolen, Žilina

From	To
Trnava	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Vrútky, Zvolen, Žilina
Vrútky	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Zvolen os. st., Žilina
Zvolen	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Lučenec, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Žilina
Žilina	Banská Bystrica, Bratislava hl.st., Čadca, Humenné, Košice, Levice, Liptovský Mikuláš, Michalovce, Poprad Tatry, Ružomberok, Spišská Nová Ves, Trenčín, Trnava, Vrútky, Zvolen os. st.

The final form of the adjustment of the postal item in which the postal service is collected and distributed by the postal service shall be determined by the postal service in its postal conditions.

6.11. Freight transport by high speed trains

With the increasing globalization, freight traffic will need trains at speeds above 200 km / h opens up on major traffic routes. Due to the nature of the carriage, it is not possible to assume the boom starting and ending in the territory of the TRITIA region, but with the routes that pass or have a starting or ending point. Cargo handling including the use of special containers is similar to air transport. The trainsets must meet the requirements for aerodynamics, so they are similar to passenger trains. Standard covered wagons or sets with conventional containers have a potential of up to 120 to 160 km / h. This is not primarily a substitute for air transport, which is not intensive enough for train formation, but for new traffic flows.
The advantage of high-speed freight trains is:

- Transport speed several times higher than in road transport and thus the possibility of production cooperation between distant production sites
- Significantly lower environmental impacts, both against road and air transport
- Extension of the lifetime of trains which have already become morally obsolete for the transport of persons
- Capacity utilization of high-speed lines at the time of lower traffic intensity at night

Examples of high-speed transport use:

Country	Speed (km/h)	Rolling stock (RS)	Type of freight
Germany	≤160	Converted from passenger RS	Post, Parcels
Sweden	≤160	Modified freight RS	Post, Parcels
USA	≤240	Modified freight RS	Post, Parcels
China	≤360	Specially designed RS	Post, Parcels
Italy	≤180	Specially designed RS	Rolling containers

Note: Paragraph based on “FREIGHT TRANSPORT USING HIGH-SPEED RAILWAYS” - Inara Watson et al., Int. J. Transp. Dev. Integr., Vol. 3, No. 2 (2019) 103–116

TGV LA POSTE
This involved the transport of postal items with modified TGVs at 270 km / h, which began in 1983 and ended in 2015.

MERCITALIA FAST

On 7 November 2018, the rail freight carrier Mercitalia launched the Bologna - Napoli (Maddaloni-Marcianise) line with a journey time of 3 hours 20 minutes and an average speed of 180 km / h for consignments with a maximum size of 70x80x180 cm and a weight of 220 kilograms. The refurbished ETR 500 will replace 18 trucks or 2 Boeing 747 aircraft. Trains run every night.

Mercitalia Fast has been designed to meet the needs of customers such as express couriers, logistics operators, manufacturers, distributors and property developers.

Goods will travel aboard a high-speed train that has a load capacity of 18 trucks. The use of roller containers makes loading and unloading fast, efficient and safe.

This first Mercitalia Fast service will relieve traffic on Italy's main motorway (Autostrada A1) by approximately 9,000 trucks a year, reducing atmospheric carbon dioxide emissions by 80% compared to road transport.

Sources:
https://zdopravy.cz/druhy-zivot-pro-pendolino-italove-z-nej-udelali-nakladni-rychlovlak-17610/
http://www.mercitaliarail.it/cms/v/index.jsp?vgnextoid=008abad1535c6610VgnVCM1000008916f90aRCRD&vgnextchannel=737ce13f377db510VgnVCM1000008916f90aRCRD

CHINA

Kits for high-speed freight transport are being developed in China. The transports were expected to start in 2016. Transports to Russia and Europe are planned in the future. Trains should reach speeds of up to 400 km / h. The question is the realization of routes in Russia where VRT Moscow - Kazan would be useful and further in Europe, especially in terms of financing.

At present, high-speed mail and parcel transport is used in the form of transport in dedicated wagons of passenger trains.

NGT

The Next Generation Train (NGT) is a research project of the German Aviation Center (DLR). This project is developing concepts for a new high-speed train, a regional train and a fast freight train. An exemplary European corridor between Madrid and Bucharest was analyzed for the concept of the NGT CARGO fast freight train. The model train uses high-speed lines in Spain, France and Germany and then follows the Danube Corridor railway line through Austria, Hungary and Romania. A scenario has been created to move reasonable (valuable, fast goods) from truck transport to this high-speed rail system. Based on the volume of goods from the 2030 transport forecast from the German Ministry of Transport (BMVI), two rail logistics approaches were compared:

- single wagon system with displacement
- line train system where goods are automatically transferred between trains in terminals.

The goods must of course be processed automatically, eg Euro pallets with maximum loading capacity and fixed goods. The train's departure frequency must be high in order to achieve a high average transport speed. Therefore, the volume of goods per train is low, which makes the single wagon system inefficient. For example, complete cars have to go there daily, regardless of their load factor. Furthermore, a timetable analysis was carried out for the German and partially French part of the route in order to evaluate the feasibility of integrating a high-speed freight train into the current and future traffic flow on conventional and high-speed lines. Passenger trains retain a higher priority (even local trains). Only conventional freight trains are rated lower than NGT CARGO. The analysis shows that the train path is slightly slower than the ideal trajectory in real conditions, but this does not have a profound impact on average transport speed.

- A maximum speed of 400 km / h with a travel time of 3 days and an average speed of 150 km / h is envisaged on the route to China. The connection to China is also monitored as a Russia - Chinese project.

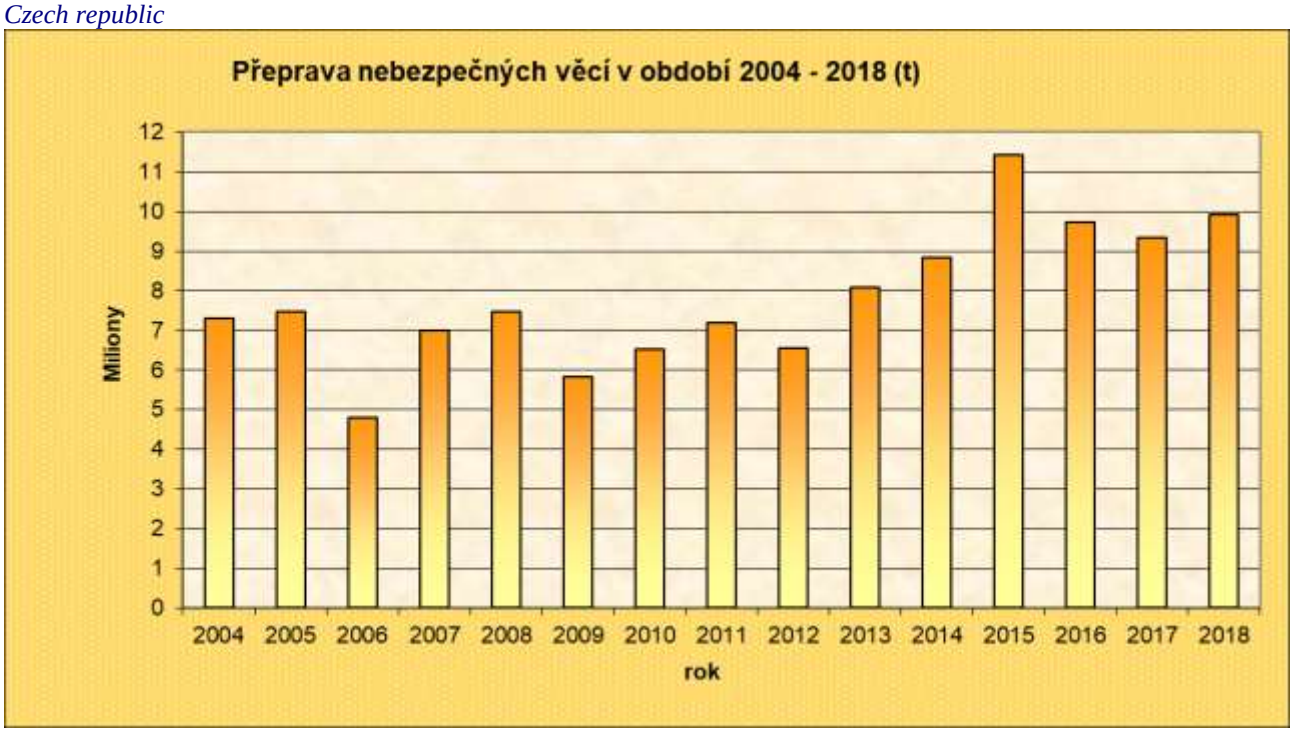
6.12. Other goods (dangerous goods, fuel, etc.)

Czech republic

The transport of hazardous substances is associated with major risks related to the possibility of environmental pollution in the event of accidents, as well as risks related to the health damage caused by handling these materials. When transporting, loading, unloading, storing it is necessary to observe special conditions - considerably more caution, observe safety rules, respect traffic restrictions, train drivers, use safety consultants in companies, etc. Vehicles must be suitable and approved for this type of transport, in good they must be properly marked with a label indicating the type of danger. substances and the like. These substances are categorized and the conditions under which they can be transported, handled, in which packages, etc. are prescribed for each category.
In road transport, the European Agreement concerning the International Carriage of Dangerous Goods by Road - ADR Agreement applies to the carriage of these goods. In rail transport, the Regulations for International. rail transport of dangerous goods RID. In maritime transport, it is the international maritime code for the transport of dangerous goods - IMDG code.
Hazardous substances may include various chemicals (mostly liquids or may be in loose form, etc.). According to the nature of the goods - kind chemic. The transport packaging (eg barrels, bottles, etc.) is also chosen for the substance, volume and distance of transport. It can be piece goods on pallets or full truck (road or rail tankers), tank container. By rail, dangerous chemicals are usually transported over long distances from chemical manufacturers to their customers. In the MSK region, Borsodchem, a.s. in Ostrava, Bochemie, a.s. in Bohumín. Both of these companies have their railway siding set up in the time of deep totalitarianism, when the companies were established and increasing volumes of products and their character required the need for transport by rail. In general, customers who need to transport crash-dangerous goods prefer road transport because of the major problems associated with rail transport (starting with choosing a suitable vehicle, ensuring loading, unloading, compliance with safety regulations, etc.). As far as hazardous substances are concerned, the railway can only compete with the transport of large volumes of liquid substances, where a bottling facility at the final station is needed. The price, delivery time and above all reliability and safety are decisive for the customer's choice of transport type. supply.

For the transport of fuels (eg oil, gasoline), transport by rail is usually carried out over long distances, for example when transporting the raw material from the extraction site or where it can be pumped (eg from oil pipelines) to industrially processed (eg in refineries). From the processing sites, the raw materials are then usually transported by road tankers to the consumption points - ie to customers, either to the company's fuel filling stations of various transport companies, the farmer. cooperatives, buildings. companies or private service stations that supply residents with fuel.

Figure 17 – Graph of the development of the volume of dangerous goods transport by rail in 2004 -2008 (in tonnes) in Czech republic



Slovakia - permit to carry dangerous goods

Railway transport

Pursuant to Act No. 514/2009 Z.z. The Act on Rail Transport, Transport of Dangerous Goods means any activity related to the transport of dangerous goods in rail transport, including activities related to loading and unloading from one mode of transport to another mode of transport in combined transport and to stops imposed by circumstances during transport. and handling of dangerous goods on the premises of the sender and receiver of dangerous goods). The rules for the transport of dangerous goods under the Regulations for the International Carriage of Dangerous Goods by Rail (RID) apply to the international, domestic transport of dangerous goods from EU countries or COTIF countries. At the same time, the RID Regulations apply to ancillary carriage to rail services to which the Uniform Rules for the Contract for the International Carriage of Goods by Rail (CIM) apply, subject to the international rules applicable to carriage by other modes of transport. The Slovak Republic, as a Contracting State of RID, has the right to regulate / prohibit the international transport of dangerous goods within its territory. The RID order determines which hazardous substances are permitted for carriage under international conditions under certain conditions.

According to Directive 2008/68 / EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods and Act No. 514/2009 Coll. on Rail Transport (§23 Transport of Dangerous Goods in Rail Transport) the provisions of the RID Regulations also apply to the national transport of dangerous goods in the territory of the Slovak Republic and in the territory of all EU Member States. The transport document for dangerous goods by rail under RID conditions is the consignment note (NL) of the CIM.

In the case of the transport of dangerous goods from / to the countries of the Agreement on the International Carriage of Goods by Rail (SMGS), transport at border crossing points

(Čierna nad Tisou and Maťovce ŠRT) is carried out in accordance with Annex 2 to the SMGS Convention. The dangerous goods transport document under the terms of the SMGS Agreement shall be the consignment note under the contract of carriage (SMGS or CIM / SMGS), the wagon consignment note under the General Agreement on the Use of Wagons (GCU) or any other transport document conforming to the other provisions of Section 5.4.1 of the SMGS Agreement. The completion of the consignment note (NL) other than Annex 2 to the SMGS shall comply with the provisions of Annex 1 to the SMGS Agreement (point 8). When using NL CIM / SMGS, the provisions of Annex 6 to the SMGS Agreement (and its Annex 2) / GLV CIM / SMGS (Annex 2) shall be observed. The routing route for the carriage of consignments by CIM / SMGS consignment note shall be agreed within the meaning of point 14.3 of Annex 6 to the CIM / SMGS SMGS / GLV Agreement. Transfers after normal gauge to the CIM / CUV transport document may also be carried out via the Čierna nad Tisou border crossing station, in which case the transport shall be carried out according to RID and not according to Annex 2 to the SMGS.
Instead of NL, it is possible to use technical electronic data processing (EDP) or electronic data interchange (EDI) systems as aids. The use of technical systems is permitted provided that the procedures for collecting, storing and processing electronic data comply with the legislative requirements regarding the conclusiveness and availability of data during transport as in paper documentation.
The transport of dangerous goods in the territory of the Slovak Republic according to the Act on Transport on the Railway No.514 / 2009 is prohibited if:

- wagons that are registered in a third country (not in accordance with the technical competence / interoperability specifications) should be used for transport;
- tank wagons which were manufactured before 1 January 1997 (not in accordance with the technical requirements in force on the date of manufacture) should be used;
- the required level of safety is not ensured (transport conditions are not in accordance with the RID Code or with the United Nations Recommendations on the Transport of Dangerous Goods);
- it involves the transport of dangerous substances (dioxins, furans, radioactive substances) through a densely populated / protected area;
- it is not provided by advisers for the transport of dangerous goods with the necessary certificate of repulsive preparation.

The Ministry of Transport and Construction of the Slovak Republic (ICE SR), as a regulatory body, issues certificates of training of a safety advisor for the transport of dangerous goods. The regulatory authority may allow for the territory of the Slovak Republic an exemption from the Regulations for the International Carriage of Dangerous Goods by Rail (RID) and the above-mentioned provisions.

Road transport
Pursuant to the Road Transport Act No. 56/2012 Coll. transport of dangerous goods within the territory of the Slovak Republic may be carried out under the conditions specified in the European Agreement on the International Carriage of Dangerous Goods by Road (ADR) (Decree of the Minister of Foreign Affairs No. 64/1987 Coll.), as amended and the provisions of this Act.
The carriage of dangerous goods may only be carried out by a vehicle complying with the requirements of the ADR Agreement and using packaging, containers, tanks and containers that are approved and marked. During packing and other handling before

transport, during loading / unloading, during transport of dangerous goods special regulations must be observed, eg:

- Sections 22 to 26 of the Act of the Slovak National Council no. 51/1988 Coll. on mining activities, explosives and the state mining administration, as amended,
- Sections 23 and 24 of Act no. 223/2001 Coll. on waste and on amendments to certain acts, as amended,
- Sections 8 to 10 of Act no. 151/2002 Coll. on the use of genetic technologies and genetically modified organisms, as amended,
- Sections 14 and 15 of Act no. 541/2004 Coll. on the peaceful use of nuclear energy (the Atomic Act) and on amendments to certain acts, as amended by Act No. 21/2007 Coll.,
- Sections 13 and 45 of Act no. 355/2007 Coll. on the Protection, Promotion and Development of Public Health and on amendments to certain acts, as amended,
- Section 16 of Act no. 67/2010 Coll. on the conditions for placing chemical substances and chemical mixtures on the market and amending certain acts (the Chemical Act),
- Section 4 of Act no. 119/2010 Coll. on packaging and on the amendment of Act no. 223/2001 Coll. on Waste and on amendments to certain acts, as amended.

Specific rules lay down the type-safety requirements for vehicles and transport equipment and the methods of use, storage, cleaning, disinfection and decontamination, and rules for handling and transporting explosives, radioactive substances, chemicals, biological and other hazardous wastes, living micro-organisms and genetically modified organisms.
The Ministry of Industry and Trade of the Slovak Republic carries out professional supervision of international transport, transports to and from other countries and cabotage transports in Slovakia, including transport of dangerous goods. It also checks whether the legal requirements underlying the issuing of Community licenses, transport licenses, driver's licenses and driver attestations and the transport of dangerous goods to carriers, consignors, consignees and other persons involved in the transport of dangerous goods are laid down by the Road Transport Act. No.56 / 2012 Coll and the ADR Agreement.
Under Article 2 of the ADR, Annex A defines:

- dangerous goods which are excluded from international transport,
- dangerous goods authorized internationally and conditions for their authorization.

In the case of transport of radioactive material in the territory of the Slovak Republic, such transport is subject not only to the provisions of international agreements on the transport of dangerous goods (ADR / RID) but also to Act no. 87/2018 Z.z. on radiation protection and amendments to certain acts. In order to carry out the transport of radioactive materials, the Ministry of Transport of the Slovak Republic as a radiation protection authority pursuant to Section 4 of Act no. The permit for the transport of radioactive materials is also required for activities performed by persons from abroad who have their registered office or permanent residence in the territory of another Member State.
Selected special requirements for transport of radioactive material pursuant to Act no. 87/2018 Z.z. on radiation protection and amendments to certain acts:

- Transport of radioactive material is possible by road, rail, air and inland waterway; in accordance with the basic principles of radiation protection, radioactive material must be separated from the persons involved in the transport and from the occupants.
- Transport of radioactive material in road transport may only be carried out by a two-track motor vehicle.

- The holder of the transport authorization shall plan the transport route in such a way that the transport route avoids densely populated areas and can be completed in the shortest possible time.
- For the transboundary shipment of institutional radioactive waste, standard forms according to a special regulation are used.
  The applicant / holder of the license for the transport of radioactive materials shall:
- have a designated professional representative (holder of a valid certificate of professional competence for the transport of radioactive materials, who is in an employment relationship with the applicant / in a similar employment relationship),
- take measures to ensure radiation protection,
- ensure continuous monitoring of compliance with radiation protection requirements,
- adapt their operational documentation to the requirements of Act No. 87/2018;
- report any shipments of radioactive materials (except reserved shipments):
- at least 24 hours in advance of the Ministry of Industry and Trade of the Slovak Republic and the regional public health office through which it passes,
- if the activity carried exceeds 3000 A1 / 3000 A2 / 1000 TBq, the authorization holder shall notify the shipment no later than seven days before its commencement,
- indicate the scope of the notification data (name and address of the carrier, consignor and consignee, telephone number, fax number or e-mail, telephone number or fax number of the carrier, date, time, mode and route of transport, type of means of transport; vehicle number, UN number and transport index of each consignment, if known, type, activity and physical form of the radioactive material transported, in the case of cross - border shipment the date, time and place of each border crossing).

The applicant for the issue of the license for the transport of radioactive materials for the Department of the Head of the Ministry of Health of the Ministry of Industry and Trade of the Slovak Republic shall state in the application:

- business name, legal form, registered office and identification number if the applicant is a legal entity, or name, surname, business name, place of business and identification number if the applicant is an individual entrepreneur,
- the activity leading to the irradiation for which authorization is sought (transport of radioactive materials),
- place of activity (eg road network of the SR)
- name and surname of the person or persons who are statutory bodies, if the applicant is a legal person,
- name, surname and residence of the professional representative.

The applicant shall attach to the application for a license for the transport of radioactive materials:

- a list of the UN numbers of the substance or object of Class 7 (radioactive material) for which a license for carriage is requested;
- characteristics of the planned activity leading to irradiation and description of the technical equipment,
- justification of the shipment,
- a transport code including a specification of the type of transport and measures to ensure radiation protection during transport, including the transport route, if known;
- a description of the technical equipment to ensure the carriage, including loading and unloading of the consignment,

- an assessment of the risks arising from the nature of the radioactive material transported, the mode of transport and the itinerary;
- emergency transport plan,
- packaging package documents (list of package types, list of assigned identification marks, copies of approval certificates by the competent authority and / or package design documentation),
- proof of the technical capability of the means of transport (list of vehicles indicating the type of vehicle and its license plate number, copies of the vehicle registration cards),
- proof of suitability for the means of transport (name list of crew members and copies of driver training certificates for Class 7),
- Certificate of professional competence of a professional representative for the transport of radioactive materials (pursuant to Section 44 (2) (m) of Act No. 87/2018 Coll.)
- Plan for ensuring the safety of radioactive material during transport (pursuant to Section 84 and Annex No. 3 of Act No. 87/2018 Coll.).

If the applicant has proved that he / she fulfills the required requirements for the transport of dangerous goods, the Ministry of Transport will issue a transport permit. This permit is issued for an indefinite period.
The documents "RID Regulations" and "SMGS Convention" contain:

- General provisions;
- Classification;
- Dangerous Goods List, Special Provisions and Exceptions for Limited and Excluded Quantities;
- Use of packagings, large bulk containers (IBCs), large packagings and tanks (tanks);
- Shipping procedures;
- Requirements for the design and testing of packagings, large bulk containers (IBCs), large packagings and tanks (tanks);
- Provisions on transport, loading, unloading and handling conditions.

6.13. Transfer of traffic due to bottlenecks in other modes of transport

Czech republic
Bottlenecks, ie places with insufficient capacity for the traffic flow, are a factor that influences the economic efficiency of the entire transport route, even though it can only be a point issue.
The bottlenecks for this mode of transport are insufficient capacity roads and congestion. If the delay in road traffic is of such a size that it significantly degrades the average speed of the entire route. There would have to be more of these places on the route, but the main traffic routes, where the intention is to operate shipping in the future, but capacity roads are currently being built.
Insufficient parking capacity to take mandatory breaks
Insufficient number of parking places must be taken in a similar way as insufficient number of tracks in railway stations. In case it is not possible to take a regular break, it is not

possible to make a ride at all or to look for a parking space outside the main traffic route, which means a time and economic loss.

Exclusions in transport

A complete cessation of traffic occurs either regularly during public holidays and non-working days or accidentally, usually in the event of accidents or bad weather. Taking them into account when choosing the mode of transport is problematic because they occur unplanned. Limited problems can be predicted, for example, in winter, when road transport complications can last for days.

Narrowing the profile for traffic flow caused by maintenance

At present, on-going or under construction, it is clear that roughly every twenty years it is necessary to reconstruct both motorway and rail infrastructure using long-term traffic restrictions. On longer routes from approx. 200 km from spring to autumn months it is not possible to realistically calculate that there would be no delay with time delay and that some of the routes could be passed without any section being under reconstruction.

Slovakia

On the territory of the Žilina self-governing region there are two important limiting sections, which can currently contribute to the change of modal split in favor of railway transport. The first is the I / 11 road between Žilina and Čadca, where congestions are constantly created at the traffic lights at Kysucké Nové Mesto and within the crossing of Čadca caused by traffic lights too. The second important bottleneck is the road I / 18 between Žilina and Liptovský Mikuláš, where there are significant congestions in Žilina, below Strečno and section around Kraľovany and Ružomberok.

In both cases, a motorway network is planned or under construction to mitigate bottlenecks on the transport network in the future. Regarding the Žilina Čadca section, the section Źilina - Krásno nad Kysucou (consisting of two projects) is expected to be implemented in the following programming period with the expected end before 2030. The southern bypass of Žilina is currently under construction. with a tunnel under the Malá Fatra mountain range (expected completion 2023-2024), this section will solve the transfer of the transit load to the new road in the section Žilina - Vrútky. The section around Kraľovany is currently in the stage of preparation of project documentation and it is not clear whether it will be implemented from the next programming period. The section around Ružomberok is currently in the process of implementation and its operation is underway until 2022.

There are also significant congestions on the road I / 64 between Žilina and Rajec, but from the point of view of shifting freight loads to rail transport, this section is not significant as it has a regional character.

The road I / 70 on the stretch Kraľovany - Trstení also suffers from significant congestions. In this section, a significant factor is transit traffic, which cannot be replaced by rail transport, as the section is terminated in Trstená.

6.14. Summary of the Chapter 6

Chapter 6 describes the potential of the various modes of transport in the process of transferring goods from road to rail. It is clear that for most of the existing technologies the potential is exhausted and a sufficient proportion cannot be considered without state subsidies or legislative amendments. Thus, new loading and unloading technologies offer greater opportunities to simplify and cheaper the use of rail transport. As it will be intermodal transport, further specifications are in Part D.T2.3.2.

7. TECHNICAL CONDITIONS FOR THE TRANSFER OF GOODS FROM ROAD TO RAILWAY TRANSPORT

To be interested in transporting a certain type of goods over a long distance by rail from the customer's point of view, he knows that there must be transhipment on the road, which makes transport more expensive and time-consuming. It is decided mainly according to the possibilities of transport for a certain type of goods and place of delivery on the basis of

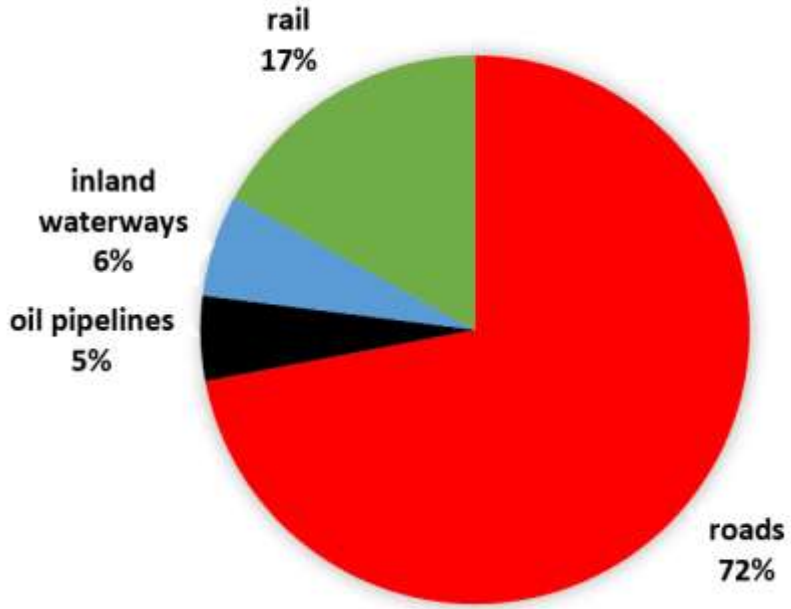
- price,
- speed of transport,
- reliability of delivery
- certain time.

while price is the most important factor.

7.1. Sufficient traffic flow

Sufficient traffic flow can only be predicted in areas around large cities and in agglomerations where there is a high concentration of industry.
Road freight transport is the most important land transport mode in the EU and represents more than 70% of all land transport activities as shown in Figure 1. The share of road transport in total freight transport by land has remained relatively stable over the last decade.

Figure 18 – the share of individual modes of transport in the European Union



Source: 7.10.2014 https://www.dlprofi.cz/33/situace-na-trhu-silnicni-dopravy-v-eu-uniqueidgOkE4NvrWuMEMvw3uZDmFpZE3CCfG4q8yS-8ZYRKejY/
Note: For 2013, the European Court of Auditors' Special Report reports a share of road transport of 75%. and rail transport 17.8%.

More than half of all freight (in terms of weight) in road transport is transported over distances of less than 50 km and more than three-quarters of freight over distances of less

than 150 km, according to calculations based on Eurostat data
On the basis of the above, it will account for **about 10% of the road transport that should be transferred**. Transferable transport over long distances is expected to move along the axis of the main transport corridors. Thus, traffic flows outside these main corridors are not subject to further assessment.
According to the distribution of the total transported quantity into different modes of transport in the attached chart, this will mean an increase for the **sum of water and rail transport from 23% (6 + 17) to 33%, an increase of 40%**. In view of the fact that in the TRITIA region the share of water transport and navigable waterways is minimal, the increase would have to be captured by rail transport, which would mean an increase of 60%, which cannot be realized on all routes. The result can be a shift to another mode of transport, namely water transport after the capacity and navigability of existing waterways.

7.1.1. Czech republic

Road transport - Year 2018
According to the 2016 census, the numbers of trucks (excluding vehicles up to 3.5 t) in the direction of the waterway were as follows:
Ostrava south - 4425 daily with an estimated tonnage of 111,000 tons
Ostrava North - 2981 vehicles per day with an estimated tonnage of 74,000 tons
According to the White Paper, if 30% of transport were to be transferred, by 2018 it would be necessary to transfer 37 thousand tonnes of goods to the south and 25 thousand tonnes to the north daily. The current traffic flow on this route can already be assessed as large enough to transfer freight to other modes of transport. The tonnage values reported correspond to approximately 35 pairs of freight trains facing south and 25 pairs of freight trains facing north or 18 pairs of fully loaded south-facing and 13 pairs of fully loaded north-facing in class Va.

Road transport - Year 2030
This topic is processed by the transport model.

Railway transport - Year 2018/2019
The total number of freight trains on the main corridor lines varies depending on the interstation sections. MSK not only serves as a transit territory in rail freight transport, but it contains a lot of starting and ending centers of traffic flows, which significantly change the number of trains in the whole region. Currently, approximately 127 freight trains run through the Ostrava junction.
These are railway stations to which more sidings are connected and large industrial enterprises with a large production volume or coal mining range. These are mines, smelters, power plants, manufacturing companies and KD terminals. Most sidings are connected to the railway stations Bohumin, Ostrava hl.n., Ostrava Hrusov, Ostrava-Kuncice, Ostrava - Vitkovice, Ostrava Trebovice, Ostrava Svinov, Havirov, Karvina, Detmarovice, Trinec, Vratimov, Paskov, Liskovec near FM, Frydek - Místek, Dobrá u Frýdku-Místku, Polanka, Studénka.
Bohumín-Vrbice - Ostrava-Hrušov, Ostrava hl.n. - Ostrava-Svinov, Ostrava-Svinov - Polanka - Studenka, Odb. Cottbus - Louky nad Olsi, Cesky Tesin - Trinec.
At present, approximately 541 freight trains per day are routed through the Ostrava junction, in the section Ostrava Hrušov - Ostrava hl.n. according to GVD 643 freight trains /

day are routed, in the section Bohumín-Vrbice - Ostrava hl.n. 626 freight trains / day, in the section Č.Těšín - Odb. Chotěbuz 531 freight trains per day and in the section Ostrava hl.n. entrance. switch - Ostrava-Svinov 599 freight trains / day, in the section Polanka nad Odrou - Studénka 683 freight trains / day and in the section Suchodol nad odrou - border of MSK 687 freight trains / day. 268 trains / day are routed through the cros-border station Petrovice u Karviné towards the state border.

Railway transport - Year 2030

In 2030, it is necessary to consider, in addition to the increase in transport according to coefficients, the need for coal imports, which will probably no longer be mined in the region.

In the outlook, freight transport is expected to increase. By 2030, 30% of road transport is envisaged for rail and waterborne transport. The expected number of freight trains going through the Ostrava junction would be 194 train routes with 388 thousand tons of goods. At present, rail transport infrastructure would not be able to accommodate the envisaged scale of transport. Forward-looking rail transport is considering increasing the capacity of bottlenecks in the railway infrastructure (see study Ostrava Node) in the territory of the MSK.

Considering the potential of the planned capacity of the railway infrastructure, a significant amount of road freight transport cannot be guaranteed.

7.1.2. Poland

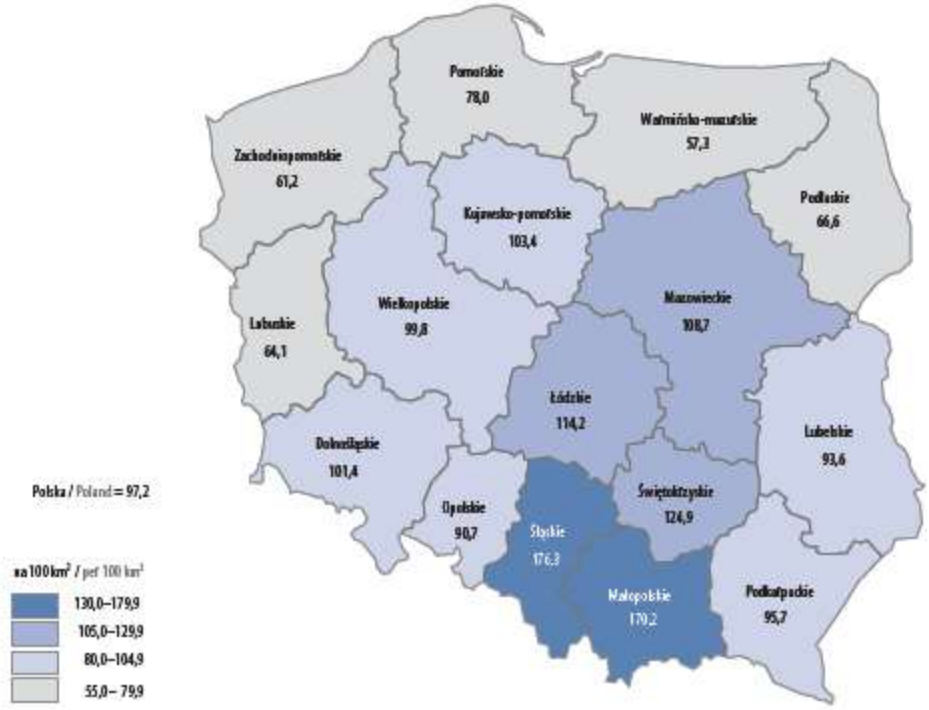
In 2018, total rail transport carried 249.3 million tonnes of goods, which is 4.2% more than in 2017 and the transport performance reached the level of 59.4 billion tonne-kilometres and increased by 8.4%. Shunting amounted to 10.3 million tonnes (less by 33.4%) and 0.06 billion tonne-kilometres (less by 42.5%).

Figure 19 – Sttructure of rail freight transport by groups of goods in 2018 (in tonnes)

The length of motorways remained stable and amounted to 1 637 km in 2018. It means that the length of motorways amounted to 5 km per 1000 km2 of area of Poland and 4 km per 100 thousand inhabitants. In spite of the significant increase in previous years, this is one of the lowest indicators in European Union countries (in 2015, the average for 28 EU–countries amounted to 17 km and 15 km respectively). The length of expressways (single

and dual carriageway) increased by 309 km in comparison with 2017 and amounted to 2 077 km at the end of 2018.

Figure 20 – Hard surface public roads per 100 km² in 2018



The total number of **registered motor road vehicles and road tractors** (according to central vehicle register) amounted to 30.8 million as of 31st December 2018 (29.6 million last year).

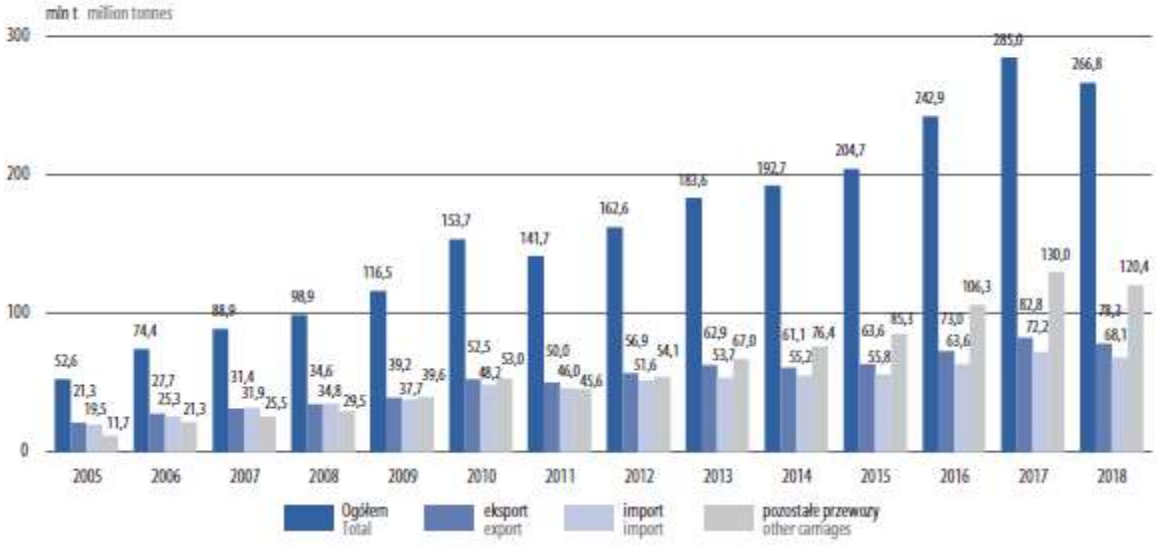
The number of **lorries** (including vans) at the end of 2018 amounted almost 3.3 million, which was almost 2.8% more than last year, of which number of lorries up to 30 years old amounted to 2.7 million (by 1.7% more than in 2017). Increaces were noticed in the share of lorries up to 5 years old from 11.0% in 2017 to 11.6% in 2018 and the share of vehicles in the age range of 16–30 years remained at the same level as the last year (36.8%) and share of lorries above 30 years from 19.3% to 20.2%. The structure of lorries in terms of load capacity was similar to the previous year, of whichlorries below 1.5 tonnes load capacity amounted to 79.4%, while 10 and more load capacity – 4.0%. In terms of fuel consumption, the share of lorries with diesel engine amounted to 67.2% (in 2017 – 66.2%), with petrol engine – 18.7% (in 2017 – 19.7%) and lorries for liquefied gas LPG – 5.2% (in 2017 – 5.3%).

In 2018, the number of **road tractors** amounted to 420.0 thousand units and was higher by 7.6% than last year. The share of tractors up to 5 years old remains at the same level as the previous year (29.2%). The share of road tractors between 16–30 year old decreased from 23.8% in 2017 to 23.6%. The share of tractor units older than 30 years remained at a similar level as last year and amounted to 5.3%.

The **road transport** carried 1 873.0 million tonnes of **goods** in 2018, i.e. by 7.2% more than in 2017 and transport performance in tonne-kilometres was higher by 8.4%. The share of hire or reward transport in the total transport amounted to 63.2%, while transport on own account accounted for 36.8%. The share of hire or reward transport in the total road transport performance amounted to 87.2% and the share of own account transport –

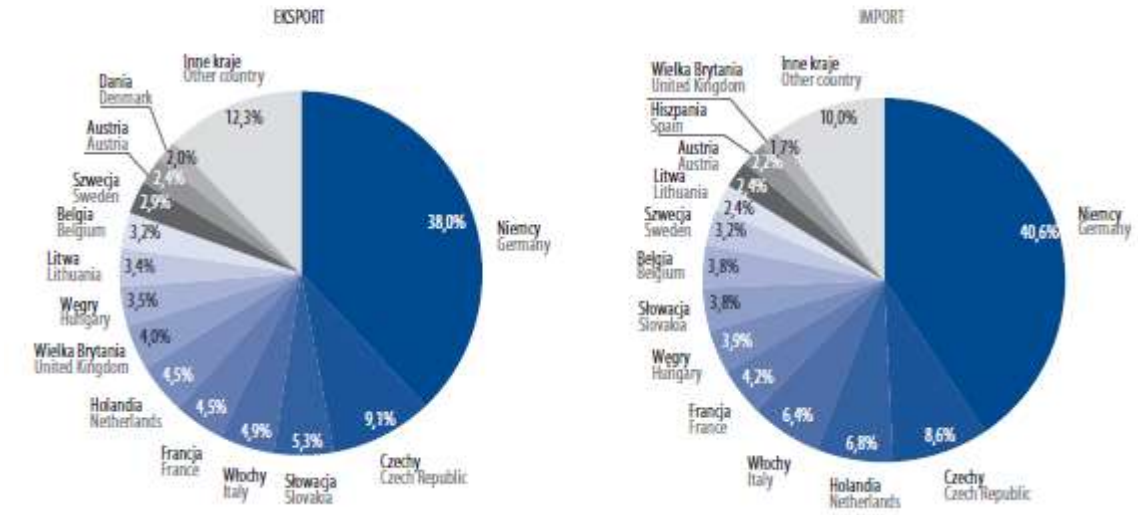
12.8%. Hire or reward transport carried 1 183.8 million tonnes (7.2% more than in the previous year), while transport performance was higher by 9.0%. Transport on own account provided 689.3 million tonnes of goods (by 7.2% more than in 2017) and transport performance increased by 4.2%.

Figure 21– Transport of goods in international road transport



In comparison to 2017 the greatest increase5 in total road freight transport was noted in the transport of equipment and materials used to transport of goods (by 16.7%), transport of cereals (by 16.0%) and transport of machinery and equipment not elsewhere classified (by 8.2%). The largest decrease was recorded in the transport of coke and refined petroleum products (by 23.3%), furniture and other products, not classified elsewhere (by 21.8%) and hard coal (by 17.1%).

Figure 22– Structure of export and import of goods by countries in 2018



In 2018, **all modes of transport** carried 2 191.9 million tonnes of **goods**, which is 6.8% more than in the previous year and the transport performance amounted to 466.9 billion tonne-kilometres, which is 7.4% more than the last year. The increase of carriage of goods

was noticed in road transport, air transport, pipeline and maritime transport while the decrease was observed in inland waterways. The transport performance grew almost in all modes of transport, excluding pipeline transport and inland waterways. In 2018, **the public transport fleet** carried 663.0 million **passengers**, which is 4.8% less than in the previous year. The decrease in the carriage of passengers was noted in road transport (by 11.1%), while the increase was in air transport (by 16.9%), inland waterways (by 10.6%), maritime transport (by 5.3%) and in rail transport (by 2.2%). The performance of passenger transport amounted to 65.0 billion passenger-kilometres and was higher by 5.6% compared to the previous year.

Table 53 – Transport of goods in large containers in rail and road transport in 2018

WYSZCZEGÓLNIENIE SPECIFICATION	Ogółem Total	Transport Transport	
		kolejowy railway	samochodowy[a] road[a]
Przewozy ładunków Transport of goods			
Tony w tys. in thousand tonnes	28 589	15 886	12 703
2017=100	119,2	112,1	129,5
W odsetkach In percent	100,0	55,6	44,4
Praca przewozowa - w tonokilometrach Tonne-kilometres			
W mln t·km In million tonne-kilometres	9 190,8	5 896,8	3 294,0
2017=100	114,0	110,5	120,8
Średnia odległość przewozu 1 tony ładunku Average distance travelled by 1 tonne of goods			
W kilometrach In kilometres	321	371	259

a Transport zarobkowy i gospodarczy: dane na podstawie wyników badania reprezentacyjnego (patrz Uwagi metodologiczn,e pkt. 20).
a Transport for hire or reward and transport on own account: data on the basis of results a sample survey (see Methodological notes, paragraph 20).

Table 54 – Transport of goods by mode of transport in 2018

RODZAJE TRANSPORTU MODES OF TRANSPORT	Tony Tonnes			Tonokilometry Tonne-kilometres			Średnia odległość przewozu 1 tony ładunku w km Average distance travelled by 1 tonne of goods, kilometres
	w tys. in thousands	2017=100	w odsetkach in percent	w mln in millions	2017=100	w odsetkach in percent	
OGÓŁEM[a] **TOTAL[a]**	2 191 888 2 202 175	106,8 108,1	100,0	467 194 467 253	107,4 108,5	100,0	x
Transport kolejowy[a] Railway transport[a]	249 260 259 547	104,2 101,8	11,4	59 388,3 59 446,8	108,4 108,3	12,7	238

Transport samochodowy Road transport	1873022	107,2	85,5	377778	108,4	80,9	202
Transport lotniczy Air transport	63	120,3	0,0	312,8	121,9	0,1	4934
Transport rurociągowy Pipeline transport	55287	105,5	2,5	21313,9	101,1	4,6	386
Żegluga śródlądowa Inland waterway transport	5107	88,4	0,2	782	89,2	0,2	153
Żegluga morska Maritime transport	9149	110,8	0,4	7619,1	81,4	1,6	833

a W mianowniku łącznie z przewozami manewrowymi. Strukturę w odsetkach policzono bez przewozów manewrowych.
a Denominator includes shunting. Structure (in percent) was calculated without shunting.

Table 55 – International transport of goods by mode of transport in 2018

RODZAJE TRANSPORTU MODES OF TRANSPORT	Tony Tonnes			Tonokilometry Tonne-kilometres		Średnia odległość przewozu 1 tony ładunku w km Average distance travelled by 1 tonne of goods in kilometres
	w tys. in thousands	2017=100	w odsetkach in percent	w mln in millions	2017=100	
OGÓŁEM **TOTAL**	**410 318**	**98,1**	**100,0**	**.**	**x**	**x**
Transport kolejowy Railway transport	82 822	110,5	20,2	26 343,0	97,1	274
Transport samochodowy [a] Road transport [a]	266 784	93,6	65,0	201 182,0	93,5	754
Transport lotniczy Air transport	63	120,6	0,0	312,7	122,0	4 972
Transport rurociągowy Pipeline transport	49 073	104,3	12,0	20 537,7	100,6	419
Żegluga śródlądowa Inland waterway transport	2 675	82,5	0,7	685,5	85,8	256
Żegluga morska Maritime transport	8 901	110,3	2,2	.	x	x

a Transport zarobkowy i gospodarczy: dane na podstawie wyników badania reprezentacyjnego (patrz Uwagi metodologiczne pkt. 20).
a Transport for hire or reward and on own account: data on the basis of results a sample survey (seeMethodological notes, paragraph 20).

Table 56 – Public roads by road categories and type of surfaces as of 31st December

KATEGORIE DRÓG ROAD CATEGORIES		Ogółem Total	O nawierzchni twardej Hard surface			O nawierzchni gruntowej Unsurfaced
			razem total	ulepszonej improved	nieulepszonej unimproved	
		w kilometrach in kilometres				
OGÓŁEM **TOTAL**	**2017**	**422 302,8**	**299 644,6**	**277 309,5**	**22 335,1**	**122 658,2**
	2018	**424 563,9**	**303 956,9**	**281 864,9**	**22 092,0**	**120 607,0**
miejskie urban	2017	69 156,7	59 252,8	57 268,8	1 984,0	9 903,9
	2018	70 437,7	60 503,2	58 508,0	1 995,2	9 934,5
zamiejskie non-urban	2017	353 146,1	240 391,8	220 040,7	20 351,1	112 754,3
	2018	354 126,2	243 453,7	223 356,9	20 096,8	110 672,5
Krajowe	2017	19 410,2	19 410,1	19 406,4	3,7	0,1

National	2018	19 403,1	19 402,8	19 399,6	3,2	0,3
miejskie urban	2017	4 204,4	4 204,3	4 201,7	2,6	0,1
	2018	4 182,9	4 182,6	4 180,5	2,1	0,3
zamiejskie non-urban	2017	15 205,8	15 205,8	15 204,7	1,1	–
	2018	15 220,2	15 220,2	15 219,1	1,1	–
Wojewódzkie Regional	2017	29 083,4	29 042,7	29 009,2	33,5	40,7
	2018	28 924,4	28 883,7	28 850,2	33,5	40,7
miejskie urban	2017	4 729,1	4 726,0	4 720,3	5,7	3,1
	2018	4 819,0	4 815,6	4 809,9	5,7	3,4
zamiejskie non-urban	2017	24 354,3	24 316,7	24 288,9	27,8	37,6
	2018	24 105,4	24 068,1	24 040,3	27,8	37,3
Powiatowe District	2017	124 673,4	114 644,1	111 338,7	3 305,4	10 029,3
	2018	124 572,4	114 874,2	111 599,4	3 274,8	9 698,2
miejskie urban	2017	13 382,9	13 103,8	12 975,6	128,2	279,1
	2018	13 894,1	13 601,5	13 467,9	133,6	292,6
zamiejskie non-urban	2017	111 290,5	101 540,3	98 363,1	3 177,2	9 750,2
	2018	110 678,3	101 272,7	98 131,5	3 141,2	9 405,6
Gminne Communal	2017	249 135,8	136 547,7	117 555,2	18 992,5	112 588,1
	2018	251 664,0	140 796,2	122 015,7	18 780,5	110 867,8
miejskie urban	2017	46 840,3	37 218,7	35 371,2	1 847,5	9 621,6
	2018	47 541,7	37 903,5	36 049,7	1 853,8	9 638,2
zamiejskie non-urban	2017	202 295,5	99 329,0	82 184,0	17 145,0	102 966,5
	2018	204 122,3	102 892,7	85 966,0	16 926,7	101 229,6

Table 57 – Public roads by road categories and voivodships in 2018 as of 31st December

WOJEWÓDZTWA VOIVODSHIPS	Ogółem Total		Krajowe National	Wojewódzkie Regional	Powiatowe District	Gminne Communal
	w liczbach bezwzględnych absolute numbers	na 100 km² per 100 km²				
	w kilometrach in kilometres					
POLSKA POLAND	**424 563,9**	**135,8**	**19 403,1**	**28 924,4**	**124 572,4**	**251 664,0**
Dolnośląskie	24 333,4	122,0	1 419,7	2 171,4	8 416,7	12 325,6
Kujawsko-pomorskie	27 516,5	153,1	1 207,1	1 751,0	7 035,2	17 523,2
Lubelskie	38 115,4	151,7	1 041,4	2 300,6	10 594,0	24 179,4
Lubuskie	15 579,6	111,4	908,5	1 593,6	4 162,3	8 915,2
Łódzkie	26 045,8	143,0	1 485,9	1 363,4	7 792,3	15 404,2
Małopolskie	31 444,0	207,1	1 097,9	1 414,2	6 625,1	22 306,8
Mazowieckie	55 008,5	154,7	2 437,1	3 018,1	15 141,6	34 411,7
Opolskie	10 504,8	111,6	779,5	995,5	3 890,0	4 839,8
Podkarpackie	21 122,9	118,4	927,1	1 725,6	6 688,2	11 782,0
Podlaskie	26 673,5	132,1	994,7	1 334,5	7 671,2	16 673,1
Pomorskie	22 720,0	124,0	914,3	1 833,8	5 714,2	14 257,7
Śląskie	24 756,4	200,7	1 228,5	1 486,1	6 350,8	15 691,0
Świętokrzyskie	17 491,7	149,4	755,0	1 075,5	6 199,9	9 461,3
Warmińsko-mazurskie	22 360,0	92,5	1 333,6	1 917,5	8 413,7	10 695,2
Wielkopolskie	41 042,1	137,6	1 736,0	2 804,5	12 195,5	24 306,1

Zachodniopomorskie	19 849,3	86,7	1 136,8	2 139,1	7 681,7	8 891,7

S o u r c e: data of the General Directorate for National Roads and Motorways.

Figure 23 – State roads in Poland as of 2017

Table 58 – Operated railway lines a by voivodships as of 31st December

WOJEWÓDZTWA VOIVODSHIPS		Ogółem[b] Total[b]		W tym Of which		
		w liczbach bezwzględnych in absolute numbers	na 100 km² per 100 km²	zelektryfikowane electrified	z liczby ogółem of total	
					jednotorowe singletrack	dwu- i więcej torowe double- and more track
		w kilometrach in kilometres				
POLSKA POLAND	**2017**	**19 209**	**6,1**	**11 854**	**10 490**	**8 719**
	2018	**19 235**	**6,2**	**11 894**	**10 501**	**8 734**
Dolnośląskie		1 695	8,5	1 080	926	769
Kujawsko-pomorskie		1 200	6,7	563	664	536
Lubelskie		1 048	4,2	416	667	381
Lubuskie		912	6,5	335	511	401
Łódzkie		1 081	5,9	999	395	686
Małopolskie		1 086	7,2	912	603	483
Mazowieckie		1 716	4,8	1 412	691	1 025
Opolskie		782	8,3	429	349	433
Podkarpackie		978	5,5	370	745	233
Podlaskie		759	3,8	219	652	107
Pomorskie		1 192	6,5	464	800	392
Śląskie		1 943	15,8	1 636	908	1 035
Świętokrzyskie		721	6,2	554	348	373
Warmińsko-mazurskie		1 084	4,5	506	783	301
Wielkopolskie		1 872	6,3	1 262	717	1 155
Zachodniopomorskie		1 166	5,1	737	742	424

a Sieć PKP i innych podmiotów będących zarządcami sieci kolejowej. Podmioty te posiadały łącznie 271 km linii normalnotorowych (w 2017 r. – 271 km), w tym 50 km linii zelektryfikowanych (w 2017 r. – 50 km). b Łącznie z szerokotorowymi, których długość w 2018 r. wynosiła 537 km (w 2017 r. – 537 km); bez kolei wąskotorowych.
a The network of PKP and other entities managing railway network. The entities had the total of 271 km of standard gauge railway lines (271 km in 2017), of which 50 km of electrified lines (50 km in 2017). b Including large gauge, which length amounted to 537 km (537 km in 2017).

Table 59 – Background information on transport (2000, 2005, 2010, 2015-2018)

Lp.	WYSZCZEGÓLNIENIE	2000	2005	2010	2015	2016	2017	2018	SPECIFICATION
1	Linie kolejowe eksploatowane*w km	22 560	20 253	20 228	19 231	19 132	19 209	19 235	Operated railway lines*in km
2	w tym normalnotorowe	21 575	19 843	20 089	19 231	19 132	19 209	19 235	of which standart gauge
3	w tym zelektryfikowane	11 905	11 884	11 916	11 865	11 874	11 854	11 894	of which electrified
4	Drogi publiczne	249 828	253 781	273 760	290 919	294 313	299 645	303 957	Hard surface public roads in km
5	w tym autostrady	358	552	857	1559	1637	1637	1637	of which motorways
6	drogi ekspresowe	193	258	675	1492	1534	1768	2077	expressways
7	w tym drogi o nawierzchni ulepszonej	205 637	227 250	249 807	268 366	271 707	277 310	281 865	of improved surface roads

7.1.3. Slovakia

The most important companies that use rail as the main mode of transport are described in chapter 6.9 together with point 7.8 which lists all siding connections in the ŽSK together with the focus of the operating entity. From the point of view of conventional freight transport, the most important are the sidings on which the operator can load and unload, which contributes to the timing of the total transport time compared to the option when he

should perform operations on general loading and unloading tracks. Due to short transport distances in Slovakia, most transports are in the regime of export, import or transit and inland transport represents only 12.48% of the total transport performance on the railway network (data from 2018).

Table 60 – Railway freight transport performance in thousands of tonnes between 2010 and 2018

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Inland	6 409	7 010	6 356	8 182	10 434	8 055	6 723	6 369	6 357
Import	17 142	15 825	15 135	16 693	16 958	16 010	16 762	17 332	18 522
Export	11 166	10 407	9 852	11 728	11 299	11 743	13 026	12 857	12 300
Tranzit	9 610	10 469	11 256	11 798	12 306	11 550	14 216	11 232	13 752
Overall	44 327	43 711	42 599	48 401	50 997	47 358	50 727	47 790	50 931

A large part of the transported volumes from and to ŽSK consists of automotive, respectively associated production related to subcontractors in the automotive industry, Wood, which is found in large quantities throughout the region, is also an important export item. The loading of timber for rail transport is realized in a large number of cost points, this situation is related to the saw-off industry and a large number of entities engaged in the sale of raw timber.
Another export item is also construction material, primarily dolomite and limestone, which are used either as construction material or as additives in the metallurgical industry. There are a large number of quarries in the region, where various minerals related to the construction industry are mined, but these are used primarily locally and transported by road transport, which in this case provides greater flexibility.

7.2. Reduction of financial costs when using railway infrastructure

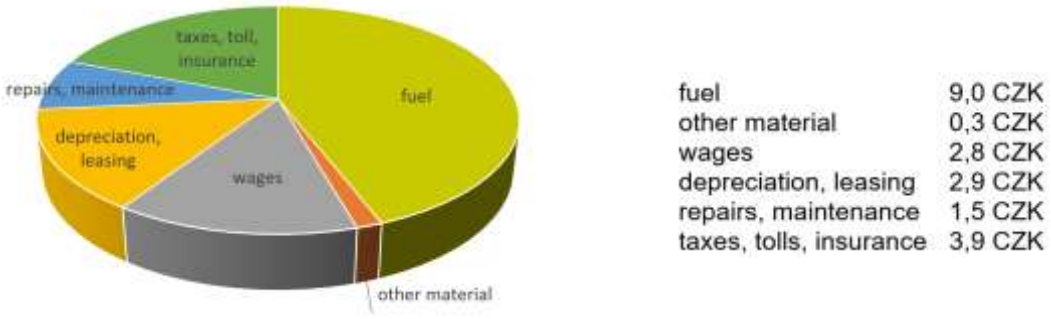
7.2.1. Czech republic

Table 61 – Shipping costs 1 tonne from the source of the cargo to the destination of the cargo (door to door)

	2018	Prediction 2030 including externalities
Road	0,95 CZK at loading 25 tone	1,20 CZK
Railway	1,10 CZK (+ 15% off road price)	1,30 CZK
Waterway	0,80 CZK	0,85 CZK

Source: http://kamionaci.com/?forum=22

Figure 24 – Cost structure of transport companies operating in road transport for category N3 in 2010



Source: http://kamionaci.com/?forum=22

Table 62 – Annual cost of tractor / trailer combination at 150 km / year

Cost item	Tractor	Semitrailer	Set	Share v %
Fuel	1 540 200	0	1 540 200	37
Tires	57 570	57 570	115 140	3
Repairs and maintenance	262 500	112 500	375 000	9
Depreciations	403 200	142 200	545 400	13
Insurance	55 613	7 705	63 318	2
Road tax	21 825	37 800	59 625	1
Toll charges	315 000	0	315 000	8
Interests	230 000	85 000	315 000	8
Wages	480 000	0	480 000	11
Averheads	336 591	44 278	380 869	9
Averall costs	**3 702 499**	**487 053**	**4 189 552**	**100**

Source: Specifics of transport costs in individual modes of transport - O. Plášil, Bachelor thesis 2017, University of Pardubice

Wages

Cost structures are increasingly converging in the road freight transport sector. The relative importance of the two main cost factors (labor and fuel costs) has now reached comparable levels across the EU. In 2004, labor costs in the Member States that joined the EU in the same year accounted for between 10% and 30% of the total costs, since then they have been rising and represent between 20% and 40% of the costs in those Member States. In absolute terms, labor costs in the Member States that joined the EU in 2004 and 2007 remain lower than in the EU-15 Member States, but this gap continues to narrow. Thus, a 100% increase in road wages compared to the 2010 chart may have an impact on the total cost of freight per kilometer ranging from 30 to 50%. Considering the fact that rail transport is currently about 15% more expensive than road transport, the factor of wage convergence to the Western European level can itself cause a shift to rail transport on long-distance routes.
Western countries, for example, require companies to pay drivers a minimum wage in the country and keep records of it, forbidding overnight in trucks and the like.
The average wage in MKD increased by 9% between 2016 and 2017 and the average wage of a truck driver was CZK 22,979 + roughly CZK 30,000 per meal and allowance.
The volume of international truck transport of Czech carriers, who have problems with obtaining drivers and the amount of wages they require, is declining.

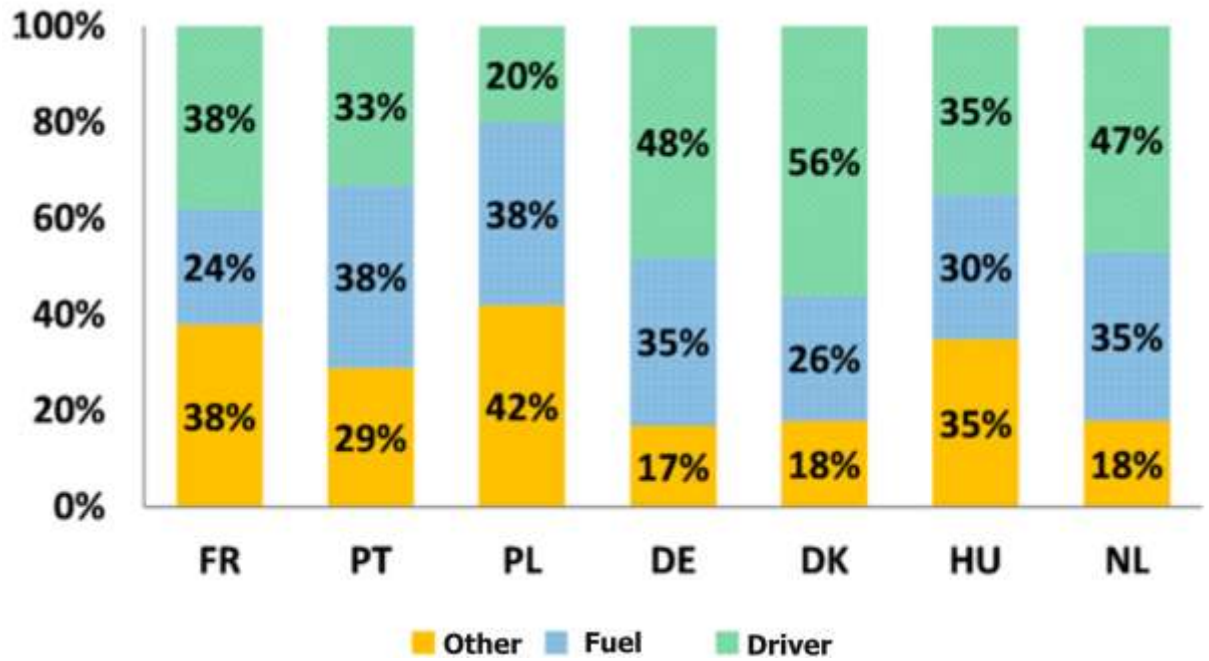
Fuels

Fuel cost differences range from 24% to 38% of total costs.

Averall weight

Given that Council Directive 96/53 EC sets maximum weights of trains at 42 and 44 tonnes according to the number of axles and in the Czech Republic this value is according to Decree No. 209/2018 Coll.
48 tons. In addition, 60% of vehicles were found to exceed the weight in 2017 in the Czech Republic. If the maximum permitted weight in the Czech Republic were adjusted according to the European directive and in addition it would be observed, it would mean an increase in costs in road freight transport by 10 to 20% per kilometer, which is also a factor which in itself can cause a long-distance freight transfer. traffic from road to rail.

Figure 25 – Allocation of costs of road freight entrepreneurs in selected EU Member States.



Source: Collection and Analysis of Data on the Structure of the Road Haulage Sector in the European Union (AECOM 2013).

In the Czech Republic, truck transporters face great competition from Polish companies
The volume of international truck transport of Czech carriers, who have problems with obtaining drivers and the amount of wages they require, is declining.
Poland is an example of a country that has grabbed the opportunity to get foreign forces, for the past three years, Poles have given work to 50,000 Russians and Ukrainians who drive trucks with a Polish brand. We also meet them on Czech roads. The license for foreign drivers takes 10 days in Poland and 180 days in the Czech Republic.
Poles also have lower wage levies. While companies in the Czech Republic pay 34 percent, in Poland only 21 percent. The Czech Republic also has about 2.20 crowns higher excise tax per liter of diesel and for Poland cheaper diesel is a great competitive advantage.
Transport volumes are also declining due to difficulties in Eastern Europe. Carriers want help from the state - for example in the form of simplifying the rules for the admission of foreign workers or improving the performance of state supervision, in particular improving the collection of fines from foreign drivers. The excise tax on diesel should also be reduced. If it were reduced by CZK 2.50, the impact on the state budget would be neutral, but the multiplier effect would be enormous. We are a transit country with the densest network of petrol stations. Everyone would refuel here. Carriers would also appreciate the so-called professional diesel or refund of part of the excise duty. All these measures are against the internalisation of external costs in transport. Moreover, Czech carriers argue only by example of carriers from Poland, not by example from Germany or Austria.
Czech transport companies make up for foreign outages by domestic transport thanks to the economic boom. They learned to implement accompanying activities such as car servicing, storage space offer, or freight forwarding, where they contract more orders than they have themselves and cover the overhang by hiring third-party capacities.
Meanwhile, carriers solve their problems by increasing their prices, which reduces their chance of succeeding against competition from the East.

The cost of the transport route on the railway

The price for the use of the railway infrastructure consists of the charges for “Operation of the infrastructure” (for “traffic management”) and charges for “Ensuring the operability of the infrastructure” (for “infrastructure of the infrastructure”).
The boundary unit price has a lower and an upper limit. The lower limit should be a matter for the owner (manager) of the infrastructure. This is the minimum income paid by the carrier, which should fully cover the costs of managing, maintaining and repairing the transport route and other operating costs. The upper limit is governed by the competitiveness of transport modes. It is directly related to transport costs. This is part of the maximum price that the carrier is willing to pay within the total shipping costs. The price cap must be designed in such a way that it does not reduce the competitiveness of rail freight transport against road freight transport.
The price for the use of a train running on the railways operated by SŽDC depends on the length and parameters of the runway, the train parameters, the basic price and the application of the product factor and specific factors that are part of the price model. The price is determined by calculation based on the actual range of carriers' performance on the railway operated by SŽDC, limited by points of contact with infrastructure operated by other legal entities. Outputs are train kilometers (vlkm) covered in a given billing period.

The resulting path price for a train running for a particular train on a line of a given category is calculated according to the following pricing model:
C = price for using the runway by train
L = train running time
Z = basic price (21,50 CZK / vlkm)
K = line category coefficient (taking into account maintenance costs, capacity demand, preference for certain lines to increase ordering capacity
Px = product factor (P1 to P5)

P2 - non-specific freight transport (= 1,0), P3 - freight. dopr. -preparing and delivering consignments (= 0.30),
P4 - combined load transport (= 0,65), P5 - freight transport non-standard trains (= 2,0)
S1 to S2 = specific factors
S1 - track wear coefficient depends on the total train weight
S2 - traction vehicle equipment coefficient ETCS (level 2 or higher) - HV must be entered in IS REVOZ

If we compare the share of costs for the transport route in the total costs of the transport company, we find that for a large transport company (eg ČD Cargo, as) the cost of the transport route is about 5%, for a medium-sized company approx. 5% of total costs.
The price for the railway transport represents about 5 - 20% of the total costs of the transport company, so it is not the main item determining the price. Fuel costs, traction units and wages have a much higher impact on transport costs. The larger the company and realizing larger volumes of transport, the lower the share of transport costs in the total cost is because it has more profits. A small transport company usually owns a small fleet and therefore perceives a much higher price in general for the maintenance and repair of vehicles. park, as well as for fuel and transport route. In competition with larger companies, it has little scope for providing discounts under contract prices. It depends on whether the transport contract is concerned - long-term regular transports of the same volume of goods or only single transports.

7.2.2. Poland

In 2018, **prime costs of sold services**1 in all transport entities amounted to PLN 222.1 billion and grew by 9.7% in comparison with 2017 (in the public sector there was a decrease of 8.6%, and in the private sector an increase of 13.9%). It increased by 8.8% in entities employing more than 49 persons (the share of these entities in the total costs amounted to 52.0%). In the total structure of costs by type, an increase in the share of materials and energy consumption (by 0.8 percentage points) and gross remuneration including employee benefits (by 0.2 percentage point) was recorded in these units with a decrease in the share of external services (by 0.7 percentage point), depreciation (by 0.2 percentage point), and other costs (by 0.1 percentage point).

Table 63 – Goods transport revenues

WYSZCZEGÓLNIENIE SPECIFICATION	2017	2018	2017	2018
	w milionach zł in millions PLN		w odsetkach in percent	
OGÓŁEM **TOTAL**	**118 426,3**	**128 731,0**	**100,0**	**100,0**
Transport lądowy i rurociągowy Land and pipeline transport	116 647,9	126 747,5	98,5	98,4
w tym samochodowy of which road transport	106 290,5	115 195,0	89,8	89,5
Transport lotniczy Air transport	590,5	731,5	0,5	0,6
Transport wodny Water transport	1 187,9	1 252,0	1,0	1,0
morski maritime transport	856,2	864,6	0,7	0,7
śródlądowy inland waterway transport	331,7	387,4	0,3	0,3

Table 64 – Costs by type

WYSZCZEGÓLNIENIE SPECIFICATION	2017	2018	2017	2018
	w mln złotych in millions PLN		w odsetkach in percent	
OGÓŁEM **TOTAL**	103 160,0	112 190,8	100,0	100,0
Zużycie materiałów i energii Energy and material consumption	15 389,6	17 624,5	14,9	15,7
w tym: energii of which: energy	2 805,7	3 041,1	2,7	2,7
Usługi obce Third party services	49 929,8	53 499,0	48,4	47,7
Podatki i opłaty Taxes and fees	2 476,9	2 675,7	2,4	2,4
Wynagrodzenia brutto łącznie ze świadczeniami na rzecz pracowników Gross wages and salaries including employee benefits	22 984,3	25 298,6	22,3	22,5
Amortyzacja Depreciation	8 192,9	8 625,1	7,9	7,7
Pozostałe koszty Other costs	4 186,5	4 467,9	4,1	4,0

a Dane dla podmiotów o liczbie pracujących powyżej 49 osób.
a Data for entities employing more than 49 persons.

Table 65 – Transport of goods by mode of transport in 2018

RODZAJE TRANSPORTU MODES OF TRANSPORT	Tony Tonnes			Tonokilometry Tonne-kilometres			Średnia odległość przewozu 1 tony ładunku w km Average distance travelled by 1 tonne of goods, kilometres
	w tys. in thousands	2017=100	w odsetkach in percent	w mln in millions	2017=100	w odsetkach in percent	
OGÓŁEM[a] **TOTAL**[a]	2 191 888 2 202 175	106,8 108,1	100,0	467 194 467 253	107,4 108,5	100,0	x
Transport kolejowy[a] Railway transport[a]	249 260 259 547	104,2 101,8	11,4	59 388,3 59 446,8	108,4 108,3	12,7	238
Transport samochodowy Road transport	1873022	107,2	85,5	377778	108,4	80,9	202
Transport lotniczy Air transport	63	120,3	0,0	312,8	121,9	0,1	4934
Transport rurociągowy Pipeline transport	55287	105,5	2,5	21313,9	101,1	4,6	386
Żegluga śródlądowa Inland waterway transport	5107	88,4	0,2	782	89,2	0,2	153
Żegluga morska Maritime transport	9149	110,8	0,4	7619,1	81,4	1,6	833

a W mianowniku łącznie z przewozami manewrowymi. Strukturę w odsetkach policzono bez przewozów manewrowych.
a Denominator includes shunting. Structure (in percent) was calculated without shunting.

7.2.3. Slovakia

With 14,000 employees, ŽSR is the largest public employer in Slovakia. Expected costs in 2019 are 532 mil. EUR for the budgeted subsidy for railway infrastructure operation from the state 270 mil. EUR for the year 2019. For investment expenditure, ŽSR receives a subsidy of 55 mil. EUR (2014-2018 average). The growth of operating costs is not compensated by the growth of revenues and subsidies. ŽSR has the space to improve its economy, in particular by increasing automation and streamlining employment, standardizing maintenance and prioritizing the most profitable investments. The currently uncontracted investment resources according to the budget of ŽSR are more than 500 mil. euros. Sustainable management needs to be set by adjusting the contract with the state. The automation of traffic management would significantly release human capacity and could then be used in other areas, especially in maintenance. In view of the aging of the population, the pressure on automation will further intensify, freeing up additional overcapacity.
In terms of revenue, rail charges account for less than 20% of all revenue.

Figure 26 – Structure of ŽSR's revenues and comparison with neighboring infrastructure managers in 2018

Effective from 1 January 2019, ŽSR collects payments for access and use of railway infrastructure and service facilities pursuant to Measure no. 2/2018 of the Transport Office dated September 7, 2018, as amended.
A conversion calculator (version 3.02, 03.01.2019) is available for quick and accurate calculation of payments as well as reduced payments.
The principles for determining the category of lines and traffic points and their list, as well as the principles of the special standstill system (SOK) and the list of traffic points providing SOK are specified in ŽSR documents at www.zsr.sk.
Effective from 3.2.2020, ŽSR will provide the following reduced payments from the maximum payments specified in Measure no. 2/2018 of the Transport Office dated September 7, 2018 as amended:
A. Performances of scheduled freight trains running on the scheduled GVD journey date and trains as required, ordered by the Railway Undertaking to the GVD going on the day they could be introduced under the GVD
1) For trains whose total actual performance in one run reached 299,999 km or less (except for handling Mn, siding and domestic relational trains), the following reduced remuneration shall apply:

- reduction of reimbursement for the ordering and allocation of capacity (reimbursement U1) by 30% of the fee for the use of railway infrastructure (hereinafter referred to as RI),
- reduction of the fee for the management and organization of transport (reimbursement of U2) by 20% of the fee for the use of RI,
- reduction of the fee for the management and organization of transport (reimbursement of U2) by 20% of the fee for the use of RI,
- reduction of the fee for ensuring the operability of the infrastructure (payment of U3) by 40% of the fee for the use of infrastructure,

- reduction of the fee for the use of electric power supply equipment for the supply of traction current (payment of U4) by 40% of the fee for the use of RI,
- reduction in the fee for access to marshalling yards and train shifting facilities, including shunting and freight terminal facilities, the only operators of which are ŽSR (reimbursement USZ3) by 90% of the fee for the use of RI.

2) The following reduced remuneration shall apply to trains whose total actual performance in a single run has reached 300,000 km or more (excluding handling Mn, siding Vlce and domestic relational trains):

- a 90% reduction in the UMP minimum access package fee (U1, U2, U3, and U4) from the RI usage fee,
- Reduction in the fee for access to marshalling yards and train shifting facilities, including shunting and freight terminal facilities, the only operators of which are ŽSR (reimbursement USZ3) by 90% of the fee for the use of RI.

3) For Mn, Vlec, national relational trains and the 1st following national relational trains, the following reduced charges shall apply:

- a 90% reduction in the UMP minimum access package fee (U1, U2, U3, and U4) from the RI usage fee,
- Reduction in the fee for access to marshalling yards and train shifting facilities, including shunting and freight terminal facilities, the only operators of which are ŽSR (reimbursement USZ3) by 90% of the fee for the use of railway infrastructure.

B.Performance of ad hoc freight trains

For ad - hoc freight trains, reduced reimbursement for access to marshalling yards and train sequencing facilities, including shunting facilities and access to freight terminals, the only operators of which are ŽSR (USZ3 reimbursement) by 90% of the railway infrastructure usage fee.

C.Clarifying the conditions for the application of reduced reimbursements

C1. The following shall be considered to be a national relational train and its following:

- Train of the number series 60000-69999 with the filling in the sense of the service GVD ND Train formation plan and Order of introduction of GVD 2019/2020,
- Train leaving and terminating from / at the train-forming station on the ŽSR network,
- A train transporting a rolling stock, i. a commuter train is not considered a relational train.

C2. A train shall not be considered to be a regular GVD train and a train as required, ordered by the railway undertaking to the GVD on the day on which it could be introduced under the GVD:

- which was introduced on a day other than its planned GVD journey or when it could have been introduced under the GVD,
- who has changed the train number on his route (regardless of whether the number changes from one regular train to another regular train, etc.). This condition does not apply to trains where the change of train number has already been considered in the construction of GVD (eg return journeys) or the train number has changed for reasons on the ŽSR side (diversion due to lockouts, accidents on ŽSR network). The carrier must apply to the O410 DG ŽSR no later than 5 working days after the train has been running for the reduced reimbursement.

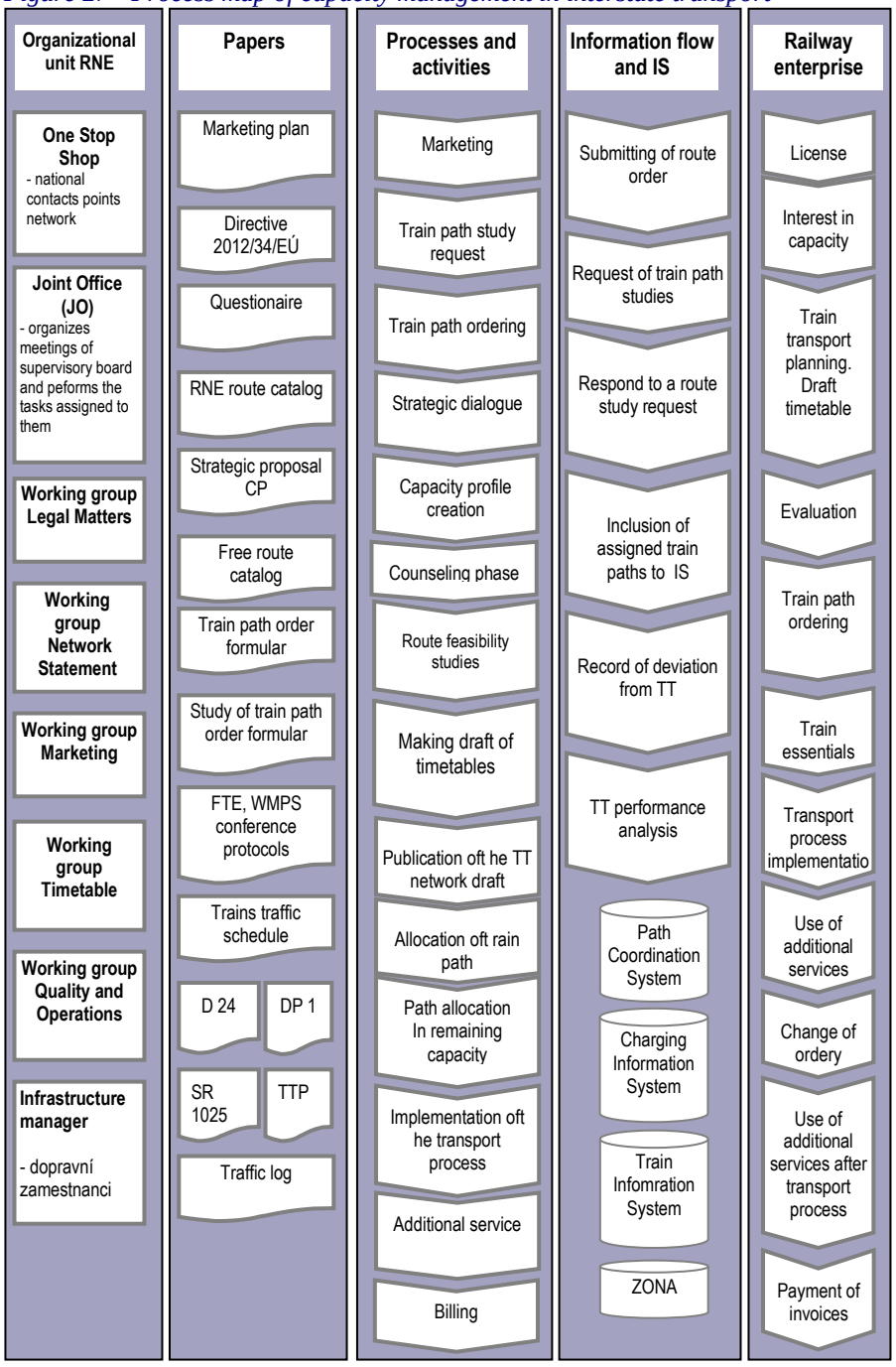
C3. Failure to apply reduced reimbursements

Reduced remuneration shall not be applied to trains where it has been established that the

railway undertaking has provided incorrect train composition data which may result in incorrect calculation of remuneration for the use of RI. Such incorrect data shall be deemed to be:

- Incorrect train weight
- Incorrect line and traction of the active traction unit

Figure 27 - Process map of capacity management in interstate transport



7.3. The formation of bottlenecks in other modes of transport

7.3.1. Czech republic

Insufficient capacity roads and congestion

In the Czech part of the TRITIA region (Moravian-Silesian Region) congestions arise due to the large volume of passenger and freight traffic on major roads (motorways and class I roads) between larger cities. This applies to Ostrava, Karviná, Havířov, Orlová, Bohumín, Třinec, Frýdek-Místek, Nový Jičín, Opava, etc. The emergence of congestion is associated with certain periods of time such as morning (4-7 h) and afternoon (14 - 16 h) it is related to the beginning and end of working hours. Roads, where large companies are based, are burdened, and the number of cars and trucks is growing.

In the area of truck transport, the sections in the north-south direction are heavily loaded. These are routes from Poland via D1 via Bohumín, Karviná (road I / 67), Č. Těšín (road II / 468) and D48 to Třinec and further along road I / 11 crossing the bridge Mosty u Jablunkova / Svčinovec to Čadca.

In the west-east direction. from Hranice n. Moravia (along D1) via Nový Jičín, Frýdek-Místek (D48) - around Český Těšín via Cottbus / Boguszowice further to Poland.

Then the route from the Jeseníky (Bruntál I / 11, Krnov I / 57) along the road I / 11 through Opava, and then through Bohumín (and the border crossing Chalupki) to Poland.

From Frýdek-Místek (by road D48) around Český Těšín and then by road I / 11 via Mosty u Jablunkova, Čadca to Žilina, components for car production are carried between Hyundaí in Nošovice and KIA in Žilina. In previous years, congestion was solved by construction of the bypass of Jablunkov (road I / 11) and Třinec. It is necessary to complete the connection of I / 11 to D48 and therefore the relocation of the road I / 68 Třanovice – Nebory and the subsequent sections of the road I / 11 Nebory – Oldřichovice – Bystřice will create a new continuation of the I / 11 road from D48 to the state border with Slovakia. In the autumn of 2019, a contract with the contractor should be concluded and in 1920 the building should be put into operation.

Although the D48 was built between Český Těšín and F. Místek, trucks shortened their way to Slovakia via the Beskydy PLA, ie via the Bílá / Klokočov border crossing (after III / 484) and I / 56 via Frýdek-Místek to Ostrava.

In order to improve the permeability of roads, the first stage of the construction of the bypass of Frýdek - Místek (connection to D48) is also planned - commissioning is expected in 2/2022 and connection of D56 in the vicinity of F.Místek to D48.

In addition, they also use the Bílá / Bumbálka / Makov border crossing (along I / 35) via Rožnov, Frenštát pod Radhoštěm, Kopřivnice, Příbor (along I / 58) towards the industrial zone in Mošnov and the airport and further to Ostrava.

In connection with higher road loads in the vicinity of the Mošnov industrial zone, construction of the Road I / 58 Příbor - Skotnice is underway and documentation for the building permit for the construction of the bypass of Mošnov is being prepared. It is expected to be operational in 2024.

The situation is also aggravated by the necessary maintenance and repair of roads and repairs of bridges in the spring - autumn period. Necessary repairs of bridges on various roads (eg on Rudná Street in Ostrava - some of its sections are closed in one lane, which resulted in major congestion on detour routes and related roads). It is a key route (road I / 11) - passing through the city of Ostrava in the west - east direction.

To increase the capacity of the connection between Ostrava and Opava, I / 11 Ostrava, the extended Rudná - border of the Opava district and I / 11 Opava, the northern bypass -

eastern part, are being implemented. Termination is expected in 2020.
Also on lower-class roads, repairs or construction of new bridges (due to their emergency conditions) and road surfaces (along individual lanes) are carried out in the spring-autumn period, creating additional bottlenecks.

Insufficient parking capacity for mandatory breaks in the car
The capacity of trucks for the necessary breaks is currently sufficient. Gradually filling parking at the gas station in km 287 D35 is outside the TRITIE region and prospectively after completion of D1 near Přerov will not be on the main north-south route and will not influence the capacity of the motorway for trucks.
According to Regulation 589/2006 Coll. it is necessary to take a 45 minutes break after 4.5 hours of driving and a daily driving time of 9 hours. If the vehicle moves on the highway at a speed of 80 km / h, it will travel 360 km for that time. This corresponds approximately to the distance between the border crossing Poland / Czech Republic and Prague to D1, where there are 31 possibilities to use the rest in the direction of Bohumín - Prague, in ideal conditions, once in 10 minutes. With an average of 5,000 trucks per day and a uniformly distributed traffic flow, it is necessary for such staggered rests to have a capacity of 17 lorries if the lorries would run at ideal distances of 34.5 seconds (768 meters) and completely regular without any fluctuations. These values are valid for the section of Bohumín - Vyškov, then in Prague it is necessary to calculate the intensity of trucks by 50% higher and hence the need of more parking spaces.

Table 66 – CAPACITY OF EXISTING PARKINGS – route border crossing Poland/Czech republic - Praha

Location	Capacity	Actual number	Kilometer	Note
Antošovice	24 trucks	44 trucks	368,6	one direction entrance
Klimkovice	96 trucks	4 trucks	344,9	one direction entrance
Vražné	33 trucks	10 trucks	319,1	one direction entrance
Kocourovec	18 trucks	17 trucks	283,2	two direction entrance
Olomouc	17 trucks	16 trucks	269,1	one direction entrance
Prostějov	is not marked	5 trucks	21,3	one direction entrance
Pustiměř	14 trucks	2 trucks	5,1	one direction entrance
Vyškov	0 - není VDZ	3 trucks	0,7	one direction entrance
Vyškov	3 trucks (záliv)	1 truck	227,6	one direction entrance
Rohlenka	16 trucks	17 trucks	206,7	two direction entrance
Brněnské Ivanovice	30 trucks	20 trucks	198,6	two direction entrance
Starý Lískovec	is not marked	5 trucks	192,3	one direction entrance
Troubsko	10 trucks	5 trucks	187,7	one direction entrance
Popůvky	9 trucks	6 trucks	184,9	one direction entrance
Devět křížů	15 trucks	1 trucks	166,7	one direction entrance
Velké Meziříčí	12 trucks	9 trucks	145,9	one direction entrance
Stránecká Zhoř	20 trucks	3 trucks	137	one direction entrance
Jamenský potok	9 trucks	4 trucks	121,8	one direction entrance
Pávov	13 trucks	10 trucks	111,4	one direction entrance
Mikulášov	is not marked	4 trucks	95,8	one direction entrance
Humpolec	11 trucks	6 trucks	89,1	one direction entrance
Speřice	11 trucks	4 trucks	84,1	one direction entrance
Dunice	14 trucks	7 trucks	72,4	one direction entrance
Kalná	6 trucks	9 trucks	58,2	one direction entrance

Střechov	32 trucks	49 trucks	52,6	one direction entrance
Brtnice	4 trucks	1 truck	42,5	one direction entrance
Naháč	15 trucks	10 trucks	29,9	one direction entrance
Božkov	8 trucks	9 trucks	18,9	one direction entrance
Nupaky	is not marked	3 trucks	9,9	one direction entrance
Průhonice	10 trucks	2 trucks	6,7	one direction entrance
Újezd u Průhonic	16 trucks	9 trucks l	4,7	one direction entrance

Note: Processed from orthofotomap www.mapy.czyear 2016, www.google.cz/maps a www.rsd.cz – capacity according to horizontal traffic signs

From the table above, it is clear that 15 rests are at the border or beyond the capacity where the trucks are outside the marked locations. At the average distance of trucks in the section Bohumín - Vyškov 768 meters and Vyškov - Prague 512 meters, there are at least 629 vehicles in total on the route. Since there is a total of 466 parking places, the average traffic flow of land vehicles can not be placed, for example, before weekend bans. Being very theoretically, a total of 14,912 vehicles could be parted at a rest time of 45 minutes per day, it would have to be a perfectly ideally uniform traffic flow. Actual occupancy rates, however, show the imminent fulfillment of the capacity of the stall, with the fact that the capacity is totally inadequate for waiting at the weekend bans.
On the basis of the above, road transport is not attractive for goods to be transported over longer distances and delivered on Monday, as it requires driver night work, which should be more expensive. However, the time barrier but the driving bans can not be created by themselves, the problem is rather the shutdown of the truck in order to rest the driver during the long journey, when all the trucks must be placed on the parking lot, for example 466 according to the table in Chapter 2c, for example from Bohumín to Prague.

Nedostatečný počet řidičů
The insufficient number of drivers is now becoming a bottleneck in road traffic.
Year 2010 - there are no known problems with lack of drivers
Year 2015 - information on missing drivers in the Czech Republic is published
Year 2018 - According to recruitment agencies, 10,000 vehicle drivers are missing in the Czech Republic
Road freight transport is thus in a situation where cargo cannot be transported because of the lack of labor. Given the fact that in road transport one person is needed to transport an average of 25 tonnes of freight, while in rail transport one person carries an average of 1000 tonnes of freight, the factor of labor shortage in road transport is 40 times more important.

Time driving restrictions

Table 67 - Time driving restrictions, Road transport – out of vacation

country	friday	saturday	sunday	public holiday
Czech republic	**bez omezení**	**bez omezení**	**13-22**	**13-22**
Poland	**bez omezení**	**bez omezení**	**bez omezení**	**8-22**
Slovakia	**bez omezení**	**bez omezení**	**0-22**	**0-22**

Table 68 - Time driving restrictions, Road transport – vacation time

country	friday	saturday	sunday	Public holiday
Czech republic	**17-21**	**7-13**	**13-22**	**13-22**

Poland	**18-22**	**8-14**	**8-22**	**8-22**
Slovakia	**bez omezení**	**7-20**	**0-22**	**0-22**

Source: http://www.policie.cz/clanek/reditelstvi-sluzby-dopravni-policie-zpravodajstvi-zakaz-jizdy-kamionu-v-cr-a-sousednich-statech.aspx

7.3.2. Poland

ROAD:

The national road network, although it accounts for only 4.6% of the total public road network, it handles over 40% of traffic. In addition, road transport has a dominant share in the transport of loads (over 85%) and passenger transport (75% of the total transport work is done by passenger cars). At the same time, roads of local importance - poviat and communal - do not have sufficient funding in the distribution of public revenues and their technical condition is far from satisfactory. Nevertheless, commune and poviat self-governments undertake activities - within the framework of their resources - to improve the technical condition of these roads.

Table 69 - Technical state and quality of roads in Poland:

poziom oceny	2010	2011	2012	2013	2014	2015	2016	2017[8]
pożądany/ dobry	59,1%	58,8%	64,2%	67,3%	63,1%	61,8%	51,8%	58,1%
ostrzegawczy/ niezadowalający	22,0%	23,6%	22,9%	20,7%	24,3%	24,7%	31,3%	26%
krytyczny/ zły	18,9%	17,6%	12,9%	12,0%	12,6%	13,5%	16,9%	14,5%

Translation

Poziom oceny -	Rating lewel
Pożądany/dobry -	Desired/good
Ostregawcy/niezadowalajacy -	Warning/fair
Krytycny/zly -	Critical/bad

Source: Poland ministry of infrastructure

Co-financing of tasks related to the construction of new bridge crossings is necessary, as one of the reasons for poor transport accessibility is gaps in the existing road network. This also has negative consequences for the economic development of the area.

Table 70 - Bridge buildings on public roads in 2018 as of 31st December

WOJEWÓDZTWA VOIVODSHIPS	Mosty i wiadukty Bridges and viaducts			Promy Ferries	Tunele i przejścia podziemne Tunnels and underpasses
	ogółem total	trwałe permanent	tymczasowe temporary		
	w szt. units				
POLSKA **POLAND**	**36 905**	**36 710**	**195**	**42**	**763**
Dolnośląskie	5 135	5 130	5	–	57
Kujawsko-pomorskie	1 202	1 194	8	1	27
Lubelskie	1 876	1 859	17	–	15
Lubuskie	1 272	1 271	1	1	4

Łódzkie	2 280	2 272	8	2	38
Małopolskie	4 323	4 296	27	9	62
Mazowieckie	3 399	3 382	17	1	105
Opolskie	1 442	1 440	2	–	8
Podkarpackie	2 522	2 501	21	4	34
Podlaskie	1 418	1 400	18	1	20
Pomorskie	1 674	1 655	19	–	69
Śląskie	4 252	4 229	23	1	159
Świętokrzyskie	1 278	1 268	10	–	17
Warmińsko-mazurskie	1 480	1 473	7	1	39
Wielkopolskie	2 190	2 183	7	12	94
Zachodniopomorskie	1 162	1 157	5	9	15

Source: data of the General Directorate for National Roads and Motorways.

It is necessary to systematically improve the technical condition of the Polish national road network in order to remove bottlenecks and expand it. The imperfections of the Polish road network include, in particular:

- lack of a coherent network of motorways and expressways between agglomeration centers;
- fragmentary implementation of full road routes in A and S class between Polish seaports of basic importance for the national economy (Gdańsk, Gdynia, Szczecin and Świnoujście) and the largest socio-economic centers of the country and neighboring countries;
- not adapted to transfer pressure 115 kN / axle;
- heavy traffic, including trucks, passing through built-up areas along road axes;
- insufficient instruments to support the development of local road infrastructure.

RAILWAY:
Currently, rail transport infrastructure has the following features:

- low value of the maximum axle load in relation to the needs arising from the ordered transports;
- low capacity of sections (including those connecting sea ports) and points preventing the preparation of effective timetables, including within the agglomeration;
- short maximum permissible length of warehouses;
- poor technical condition of engineering facilities;
- insufficient level of implementation of safe driving control systems allowing trains to travel at speeds above 160 km / h;
- insufficient number of multi-level intersections with roads;
- a small number of journeys equipped with active security;
- inadequate shape of the network part and the resulting extended geometric course of many relationships;
- insufficient connections with other branches of land transport (road, inland waterway);
- insufficient accessibility of railway infrastructure for people with disabilities.

Some of the above mentioned imperfections of rail transport are particularly severe from the point of view of access to Polish seaports, especially those with so-called fundamental for the national economy, i.e. in Gdańsk, Gdynia, Szczecin and Świnoujście, as well as

regional ones which are particularly important for the national transport system and for the construction of a fast and effective passenger transport system, both nationwide and regional.

7.3.3. Slovakia

Žilina, as the main node in the Žilina self-governing region, has significant roads leading to the south, north and east. This contributes to significant congestion in the Žilina district and leads to significant congestion formation in the city and on adjacent roads. The main raidals that suffer from congestions on a daily basis are the I / 11 road from Žilina via Kysucké Nové Mesto to Čadca, where congestions are created primarily at the traffic lights in Kysucké Nové Mesto, which has insufficient capacity. The second main road is the I / 18 road where significant congestion is formed in the section from Žilina to Vrútky due to insufficient road capacity and in Ružomberok, where there is a sequence of traffic lights that have insufficient capacity due to current traffic performance. These problems will be solved to a large extent by the new D1 efforts, which are currently under construction or in repeated procurement in the section Lietavská Lúčka - Dubná Skala.
At present, there are a limited number of rest areas for the purpose of rest for freight drivers on class I roads. This situation will be resolved during the operation of the new sections of the D1 and D3 motorways, within which new specialized rest areas with appropriate facilities will be built to ensure areas of appropriate quality at regular intervals to ensure maximum safety of freight traffic by mitigating the effects of fatigue on drivers.

Table 71 - list of all road crossings with the Czech Republic and Poland on the territory of ŽSK

Cross-border name	Road No	Categorization
Makov – Celké Karlovice – Bílá Bumbálka	E442, I/18	cars and trucks without limitation
Klokočov – Bílá	II/484	cars and trucks up to 3.5 t
Čadca – Milošová – Šance	III/01179	excluding buses
Svrčinovec – Mosty u Jablunkova	E75, I/11	cars and trucks without limitation
Skalité – Zwardoň – Myto	I/12	cars and trucks up to 3.5 t
Skalité – Zwardoň – Myto	D3	cars and trucks without limitation
Novoť – Ujsoly	III/5206	cars and trucks up to 3.5 t
Oravská Polhora – Korbielów	I/78	cars and trucks up to 3.5 t
Borov – Wincerówka	III/52013	cars
Trstená – Chyžné	E77, I/59	cars and trucks without limitation
Suchá Hora – Chocholów	II/520	cars and trucks up to 3.5 t

The busiest crossing to the Czech Republic is Svrčinovec - Mosty u Jablunkova through which long-distance transport goes either to the Czech Republic or to Poland. The second less important crossing is Makov - Veľké Karlovice - Bílá Bumbálka, this crossing was more significant in the past, when the motorway network through Považská Bystrica was not completed, when there was a significant shift of long-distance freight and passenger transport to neighboring crossings and preferring other routes is the need to overcome two significant ascents to Bumbalka and Melocik with a maximum elevation of up to a maximum of 12%, which is an obstacle to reduce transport speed, especially in winter, when in poor conditions can be completely closed due to difficult road freight. After the completion of the D3 motorway with a link to the Czech network, there is a presumption of the transfer of part of the burden on this crossing and the overall release of other adjacent crossings.

The I / 59 road from Dolny Kubin to Trstena, which continues to Poland, suffers a significant burden. In Dolný Kubín, two first-class roads I / 70 and I / 59 are connected, thus significantly increasing the traffic load on the road. The main source of freight transit traffic is the I / 59 road, which is a continuation of the transit route Šahy - Banská Bystrica - Ružomberok - Dolný Kubín and which provides the north-south connection. The main reason for the high load is the insufficient capacity of the communication, which was originally II. Category and its corresponding technical parameters such as width of communication, communication in the field, radius of curves and more. All this adds to the limited capacity, which is exacerbated by the passage through a large number of municipalities with a reduced maximum speed to 50 km / h. This situation is gradually being solved by the construction of the R3 expressway, which currently consists of several bypasses of important towns built in half profile. The construction of the expressway in this area is very demanding in terms of communication, as the road is routed in the valley of the river Orava, which is surrounded by rugged relief and it is often necessary to overcome natural obstacles through bridges, slits or tunnels. in the case of short sections of a kilometer length.
Z pohľadu počtu vodičov nákladných vozidiel chýba na území Slovenskej republiky niekoľko tísíc vodičov. Ide o dlhodobý stav, ktorý nemá perspektvíu zlepšovania sa v blízkej budúcnosti, bez zmeny systémového prístupu v nákladnej doprave. Z tohto dôvodu bola v roku 2019 iniciatíva za zníženie veku vodičov nákladných vozidiel z 21 rokov na 18 rokov a veku vodičov autobudov z 24 rokov na 21 rokov. Tento návrh zmeny zákona nebol prijatý vzhľadom na obavy vyplývajúce z možnej zvýšenej miery nehodovosti vyplývajúcej z neskúsenosti mladých vodičov a z toho vyplývajúcej vyššej miery nehodovosti v cestnej doprave.

Capacity of parking spaces to perform mandatory breaks

Similarly to the Czech Republic, the organization of working hours and rest periods for drivers of freight over 3.5 t are laid down in European Parliament and Council Regulation (EC) 561/2006.
The capacity of parking / resting places for trucks within ŽSK to complete mandatory breaks is shown in the following table.

Table 72 – Reserves within ŽSK, SR

Parking	Number of parking places		
	Personal car	Lorry	Bus
Čierne	33	8	3
Svrčinovec	7	20	2
Predmier	15	4	3
Turčianska Štiavnica	15	6	3

In case of the number of parking places for freight vehicles in the section Svrčinovec – Žilina, Skalité – Žilina is adequate. Only bottleneck is in the section Bytča – Žilina, where are not any parking areas for freight vehicles, which would be public available (parking areas are directly in private companies area).

7.4. Simplification and acceleration for oversized shipments

7.4.1. Czech republic

Because oversized shipments are specific - each case is a little different and needs to be assessed individually, there are no generally applicable procedures to simplify and speed up these processes. The preparation of oversized transport alone requires a longer time, since it is necessary to first examine suitable transport routes in relation to the dimensions of the consignment, to ensure a suitable wagon for transport and also a suitable train. In addition, appropriate transhipment mechanisms must be available at the start and end stations.
Planning is important well in advance of the actual implementation - it takes up to 30 days to negotiate an authorization for extraordinary shipments on the railway. For international transport, the route must be discussed with the individual carriers on the route.

Table 73 – Medium speed of transport

	2018	estimated 2030
Road	60 km/hod	60 km/hod
Railway	20 – 30 km/hod	20 – 30 km/hod
Water	7-8 km/hod	7-8 km/hod
Road oversize	5-6 km/hod	5-6 km/hod

https://www.eca.europa.eu/Lists/ECADocuments/SR16_08/SR_RAIL_FREIGHT_CS.pdf

In view of the fact that the speed cannot be achieved in the case of oversized rail transport as in the case of conventional trains, especially in the form of complete trains, the potential for rail freight transport is not high in this respect.
In the case of oversized transports, it is more or less that, because of the large dimensions, the transport speed must be reduced. So the train cannot be expected to travel at high speed.

7.4.2. Poland

In road transport, oversized loads are referred to, while in rail transport we talk about extraordinary loads (with exceeded loading gauge), and in sea transport, oversized loads.
In Polish rail transport, the Railway Traffic Management Center organizes extraordinary shipments in the structures of PKP Polish Railways. The information provided by the Center shows, for example, that in 2016-2017 a total of 16,403 special approvals were granted for the transport of unique shipments using the infrastructure managed by PLK. In 2017, a total of 8,684 approvals were granted, including 6,760 for extraordinary shipments without exceeding the gauge, with the exception of High Cube containers, 1,800 for shipments with exceeded gauge and / or exceeded pressure, and 124 for shipments that require suspension of traffic on an adjacent track.
Approximately 3% of shipments have not been approved due to exceeding technical and operational possibilities.
The rules for performing extraordinary transport on the network managed by PKP PLK, as well as in international traffic are set out in IR instruction 10. In this document, extraordinary shipments shall be considered to be those that:

- exceed the applicable loading gauge and / or rolling stock gauge,
- exceed the permissible load per axle and / or meter of track.

The subject of the contract of carriage may also be railway vehicles with an exceeded rolling stock gauge that do not have a permit to operate or do not have a valid technical performance certificate. In addition, extraordinary shipments transported by rail are also marine engines, power transformers, bridge spans, as well as railway rails.
There are several companies on the Polish market that deal with oversized and heavy shipments. These mainly include PKP LHS, PKP Cargo, as well as STK (Special Rail Transport).
The demand for unconventional and oversized cargo transport in Poland is definitely growing.
The main challenge is the need to reconcile domestic shipments with managers other than PKP PLK. Some time ago, one consent was enough for the transport of an extraordinary shipment in Poland, currently even 4 managers may be required in domestic relations. A small number of carriages in Europe may also be a problem, ranging from 8 to 12 axles to more specialized 16 or 32 axles. Currently, however, the condition of the railway infrastructure turns out to be the biggest problem.

Table 74 – Comparison of transport of oversized cargo using various modes of transport in Poland

Lp.	Criterion	Road transport	Railway transport	Inland waterway transport
1	Documentation and permission necessary do transport load	Technical drawing of the load with the required parameters and an indication of its center of gravity Transport contract, Permission from GDDKiA or permission from the road administrator, Sender confirmation that the goods can not be dividet into elements and transported in parts	Technical drawing, Technical descriptions and transport conditions, Compliance with AVV* and NHM** Waybill, Transport contract, Delivery list confirming receipt of the cargo, Permision to supervise the load, Notise PKP PLK S.A.*** about the intention of consigment transport extraordinary	Technical drawing, Loading and fastening instructions, Instructions with the list and sequence of manipulations Transport contract
2	Difficulties occuring at organizations as well as itself carriage	High fees when applying for a permit, Insufficient information of the bearing capacity and height of some bridges and viaducts No current informations of road restrictions The need to remove road obstacles (signs, ligths, power lines) Improperly designed roudabouts, making it difficult to drive vehicles, Unfair competition Limited hourly framesin which transport can be carried out	The necessity to carry out operations of loading or unloading gooda on railway sidings Curves of the tracks make it impossible to transport long-haul loads, The weight and height of the load is limited by the railway gantry profile and the height of viaducts Low transport speed	Limited number of specialized port edges for transhipment, Limited hight of bridges, No possibility of use rivers throughhout whole year Lack of lighting for night navigation
3	Time for obtain authorization	14 days(up to 180 days in case of appealed from negative discusion)	30 days	Permits are not required
4	Time of transport	from a few to several tens days	up to 10 days	up to 30 days
5	Awerage transport speed	5-6 km/h	20-30 km/h (50 km/h korytarze)	7-8 km/h

*AVV –General agreement of the freight vagons use, ** NHM –Hrmonized list of goods, which is used to specify the name of goods and its code in the consigment note, *** PKP PLK S.A. – Polskie Linie Kolejowe, manager of the national railway network.

7.4.3. Slovakia

A detailed thematic description can be found in Section 6.3, which also lists all the necessary documents necessary for the carriage of oversized freight by rail and road. Information on the formality of the shipment is not known and will be based on the nature of the shipment and the envisaged route.

7.5. Increasing of safety

Safety on the track and on the road depends primarily on the human factor. Depending on the track, this also depends on the signaling devices in the stations, the lines, the traction units (which monitor the driver's vigilance), the vehicles (modern devices - sensors, sensors, etc.) monitoring the condition of certain parts of the vehicle or the load.
The track is facing a shortage of drivers who have to work overtime and do not have enough time to rest between shifts. This is reflected in a higher number of accidents, etc. Recently, the number of passes Stop signal has been increasing.
E.g. on line No. 302A Ostrava hl.n. - Frýdek – Místek is an increased number of cases of passing the Stop signal.

7.5.1. Czech republic

Table 75 – Comparison of road and rail accidents

Year	Road	Railway
2000	211 516	215
2001	185 664	205
2002	190 718	428
2003	195 851	316
2004	196 484	311
2005	199 262	649
2006	187 965	374
2007	182 736	241
2008	160 376	316
2009	74 815	231
2010	75 522	280
2011	75 137	202
2012	81 404	189
2013	84 398	167
2014	85 859	193
2015	93 067	176
2016	98 864	181
2017	103 821	190
2018	104 764	172

Source: Ministry of transport Czech republic

Table 76 – Development of extraordinary events (MU) on railways (except metro) - the whole Czech Republic

Year	Number of incidents	Killed	Injured
2015	1052	234	248
2016	1111	243	186
2017	1161	237	206
2018	1171	212	209
2019	1229	238	238

Source: Railway inspection

Table 77 – Development of extraordinary events on railways in Moravian-silesian region

Year	Number of incidents	Killed	Injured
2015	166	29	40
2016	141	18	15
2017	185	27	15
2018	172	19	9
2019	165	27	32

Source: Railway inspection

Table 78 – Number of collisions at railway crossings - the whole Czech Republic

Year	Number of incidents	Killed	Injured
2015	165	32	130
2016	176	46	68
2017	171	34	83
2018	170	33	77
2019	181	40	95

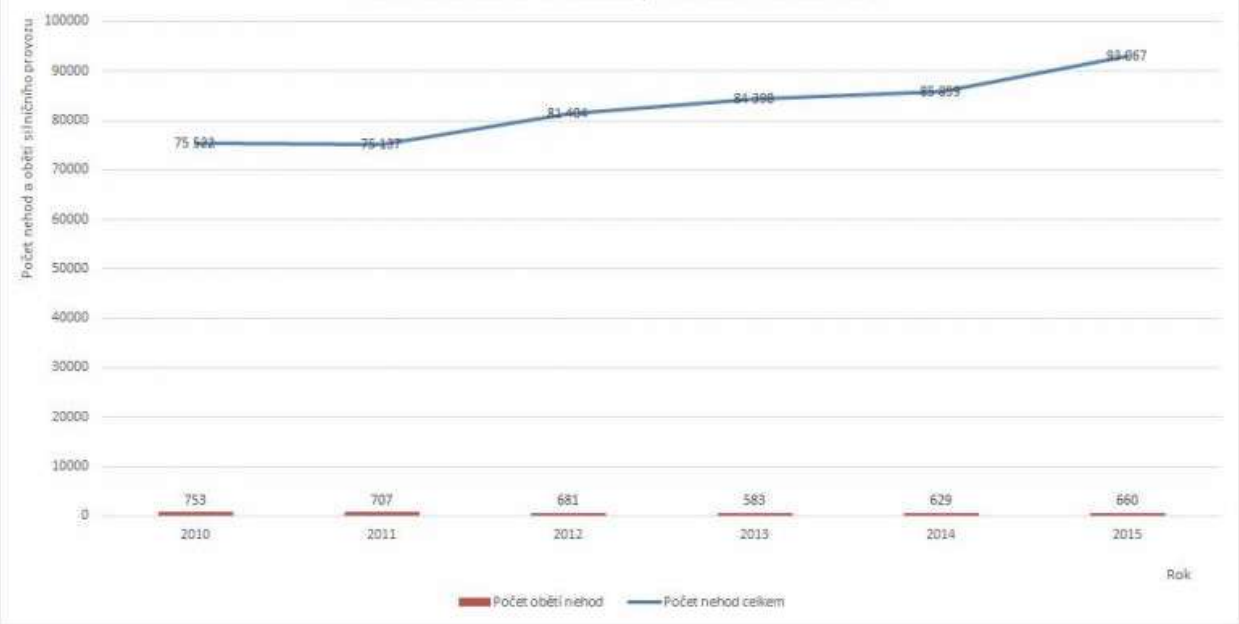
Source: Railway inspection

Table 79 – Unauthorized driving for signals prohibiting driving, including subsequent collision or derailment on the nationwide, regional and siding - the whole Czech Republic

Year	Number of incidents	Train	Shunting
2018	148	110	38
2019	150	104	46

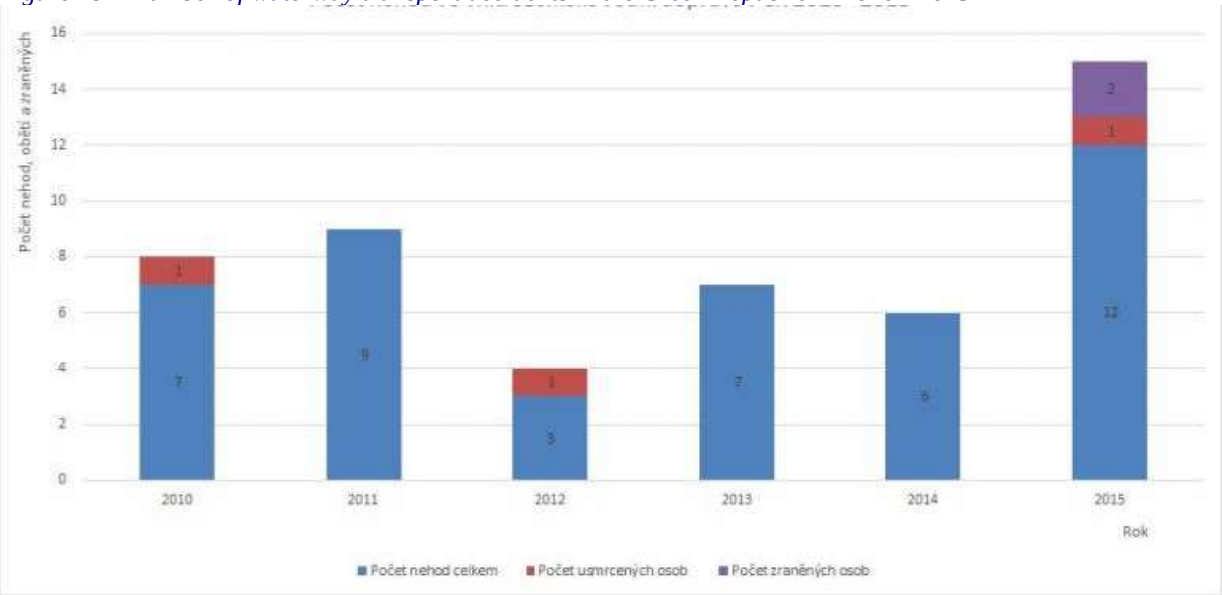
Source: Railway inspection

Figure 28 – Number of road transport accidents in the Czech Republic in 2010 - 2015



number of accident victims total number of accidents

Figure 29 – Number of waterway transport accidents in the Czech Republic in 2010 - 2015



total accidents number of deaths number of injured

Assessment - The tables show that the number of accidents on the railway is many times lower than on the road. The low number of water traffic accidents is based on the very low traffic intensity.

7.5.2. Poland

Poland road accidents statistics:

Table 80 – Road accidents and their results

WYSZCZEGÓLNIENIE SPECIFICATIOPN		Wypadki Accidents			Ofiary wypadków Accidents' casualties					
					śmiertelne killed			ranni injured		
		w liczbach bezwzględnych absolute numbers	struktura w % share in total, %	na 10 tys. pojazdów silnikowych[a] per 10 thousand motor vehicles[a]	w liczbach bezwzględnych absolute numbers	na 100 tys. ludności per 100 thousand population	na 100 wypadków per 100 accidents	w liczbach bezwzględnych absolute numbers	na 100 tys. ludności per 100 thousand population	na 100 wypadków per 100 accidents
POLSKA POLAND	**2017**	**32 760**	**100**	**11**	**2 831**	**7**	**9**	**39 466**	**102,7**	**120,5**
	2018	**31 674**	**100**	**10**	**2 862**	**8**	**9**	**37 359**	**97,3**	**117,9**
w tym w terenie zabudowanym of which bulid-up area	2017	**23 260**	**71**	**x**	**1 238**	**x**	**x**	**27 014**	**x**	**x**
	2018	**22 567**	**71,2**	**x**	**1 251**	**x**	**x**	**25 713**	**x**	**x**
Dolnośląskie		2 148	6,8	9	203	7	9	2 674	92,2	124,5
Kujawsko-pomorskie		970	3,1	6	171	8	18	1 031	49,6	106,3
Lubelskie		1 216	3,8	7	179	8	15	1 286	60,6	105,8
Lubuskie		663	2,1	8	79	8	12	790	77,8	119,2
Łódzkie		3 759	11,9	18	229	9	6	4 600	186,2	122,4
Małopolskie		3 404	10,7	13	223	7	7	4 003	117,9	117,6
Mazowieckie		4 034	12,7	8	448	8	11	4 682	86,8	116,1
Opolskie		705	2,2	9	81	8	11	787	79,7	111,6
Podkarpackie		1 481	4,7	9	125	6	8	1 775	83,4	119,9
Podlaskie		672	2,1	7	102	9	15	771	65,2	114,7
Pomorskie		2 504	7,9	14	146	6	6	3 098	133,1	123,7
Śląskie		3 222	10,2	10	219	5	7	3 783	83,3	117,4
Świętokrzyskie		1 201	3,8	12	127	10	11	1 450	116,5	120,7
Warmińsko-mazurskie		1 281	4	12	140	10	11	1 506	105,2	117,6
Wielkopolskie		3 232	10,2	10	261	7	8	3 766	107,9	116,5
Zachodniopomorskie		1 182	3,7	9	129	8	11	1 357	79,7	114,8

Source:data of the National Police Headquarters, data are from SEWIK according to as of 25th February 2019.

Table 81 – Road accidents by major causes

WOJEWÓDZTWA VOIVOISHIPS		Wina kierujących pojazdami Guilt of drivers	W tym Of which					Wina pieszych Guilt of pedestrians	w tym nieostrożne wejscie na jezdnię of which carelessness entering to the roadway
			niedostosowanie prędkości do warunków ruchu inappriopriate speed for road traffic conditions	nieprzestrzeganie pierwszeństwa przejazdu noncompliance with vehicle right of way	nieprawidłowe wyprzedzanie incorrect overtaking	nieprawidłowe zachowanie wobec pieszych incorrect behavior towards the pedestrians	niezachowanie bezpiecznej odległości miedzy pojazdami not keeping a safe distance between vehicles		
POLSKA POLAND	**2017**	**28 359**	**6 837**	**7 416**	**1 323**	**4 172**	**2 555**	**2 378**	**1 452**
	2018	**27 507**	**6 219**	**7 491**	**1 303**	**3 816**	**2 293**	**2 113**	**1 270**

Dolnośląskie	1 863	471	489	90	275	155	142	79
Kujawsko-pomorskie	825	187	204	64	173	49	65	46
Lubelskie	1 039	265	255	66	136	65	114	66
Lubuskie	595	165	119	37	90	38	32	17
Łódzkie	3 307	739	939	142	442	220	229	128
Małopolskie	2 946	644	667	102	430	338	274	160
Mazowieckie	3 609	846	1 071	174	510	189	275	161
Opolskie	629	133	169	41	60	87	26	14
Podkarpackie	1 322	300	379	70	116	140	91	62
Podlaskie	605	127	156	44	82	42	34	22
Pomorskie	2 141	489	578	86	288	188	148	96
Śląskie	2 746	407	829	105	456	318	269	183
Świętokrzyskie	980	246	270	51	107	99	82	47
Warmińsko-mazurskie	1 062	343	234	51	130	65	65	37
Wielkopolskie	2 842	663	874	130	349	210	185	96
Zachodniopomorskie	996	194	258	50	172	90	82	56

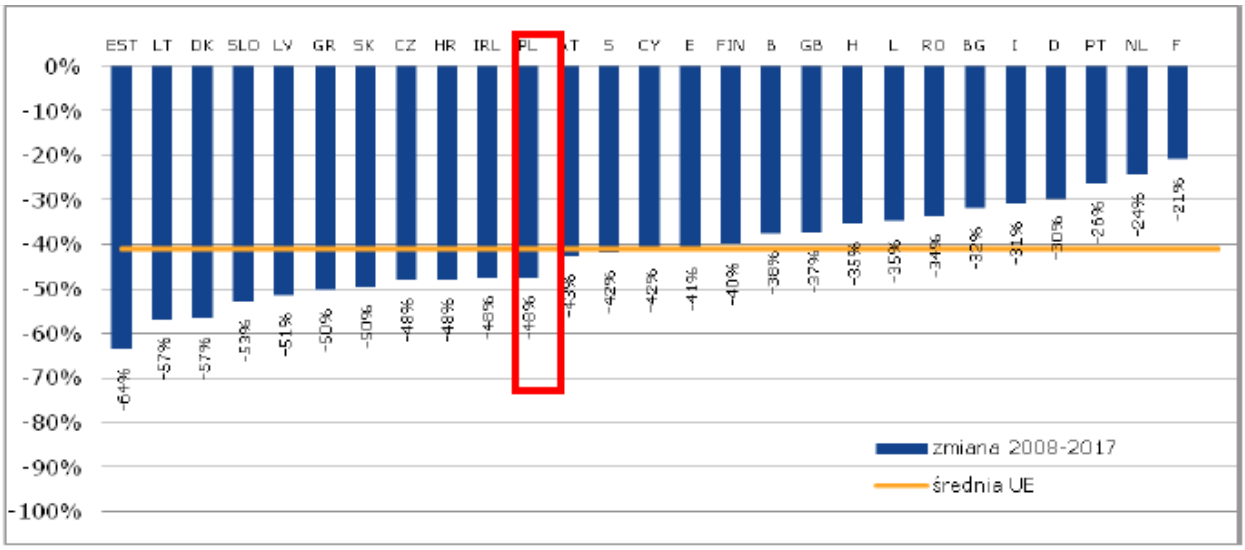
Source: data of the National Police Headquarters, data are from SEWIK according to as of 25th February 2019.

Table 82 – Road accidents by vehicles of the culprits

WOJEWÓDZTWA VOIVODSHIPS		Ogółem Total	Samochody osobowe Passenger cars	Motocykle Motorcycles	Rowery Bicycles	Motorowery Mopeds	Samochody ciężarowe Lorries	Inne pojazdy Other vehicles
POLSKA	**2017**	**28 359**	**21 733**	**915**	**1 546**	**603**	**2 284**	**1 278**
POLAND	**2018**	**27 507**	**20 590**	**1 060**	**1 709**	**634**	**2 217**	**1 297**
Dolnośląskie		1 863	1 359	95	111	40	156	102
Kujawsko-pomorskie		825	587	37	45	24	87	45
Lubelskie		1 039	777	48	81	25	70	38
Lubuskie		595	438	34	27	17	62	17
Łódzkie		3 307	2 554	95	190	64	225	179
Małopolskie		2 946	2 120	140	225	74	224	163
Mazowieckie		3 609	2 842	115	209	51	250	142
Opolskie		629	474	36	38	17	46	18
Podkarpackie		1 322	947	59	107	32	100	77
Podlaskie		605	466	19	23	7	63	27
Pomorskie		2 141	1 676	61	108	46	159	91
Śląskie		2 746	2 035	96	174	77	220	144
Świętokrzyskie		980	736	28	53	28	100	35
Warmińsko-mazurskie		1 062	772	39	78	45	83	45
Wielkopolskie		2 842	2 074	117	191	56	293	111
Zachodniopomorskie		996	733	41	49	31	79	63

Source: data of the National Police Headquarters, data are from SEWIK according to as of 25th February 2019.

Figure 30 – Change in demographic indicator: number of fatalities / 100,000 inhabitants in EU countries between 2008 and 2017, prepared on the basis of an EU commission



Source: Polish National Road Safety Council, March 2018

Security improvement measures implemented in recent years have brought noticeable effects in the form of lowering the number of victims. The decrease in the number of road accidents and their victims is also influenced by the development of road infrastructure, in particular dual carriageways limiting the possibility of dangerous overtaking maneuvers and, consequently, head-on collisions. In addition, the increase in the length of express roads caused a decrease in the number of incidents involving pedestrians and cyclists on national roads, which was the result of the total separation of motorized and non-motorized traffic.

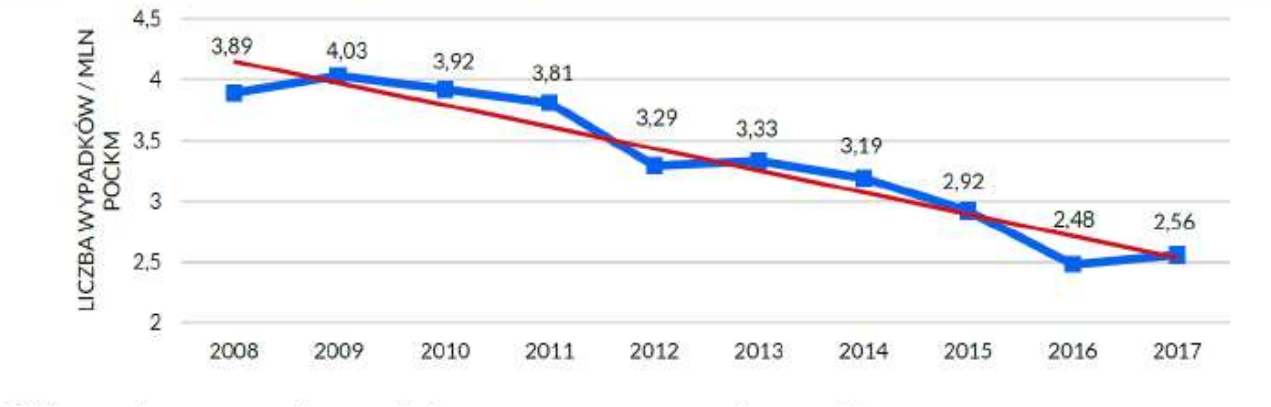
The accident rate on the railways in Poland is still one of the highest in Europe. In order to present data on the level of security and trends in this regard, the President of UTK calculates annually the so-called accident meter, referring the number of accidents on railway lines in a given year to the operational work done.

Table 83 – Meter of railway accidents in the years 2008-2017

	Year	Operational work (milion km)	Number of accidents	Indicator
Lp.	**Rok**	**Praca eksploatacyjna (mln poc.-km)**	**Liczba wypadków**	**Miernik**
1.	2008	229,8	894	**3,89**
2.	2009	209,8	845	**4,03**
3.	2010	217,2	851	**3,92**
4.	2011	222,6	849	**3,81**
5.	2012	218,5	719	**3,29**
6.	2013	211,4	704	**3,33**
7.	2014	210,3	671	**3,19**
8.	2015	218,2	638	**2,92**
9.	2016	234,0	581	**2,48**
10.	2017	242,4	621	**2,56**

Source: Polish rail transport office

Figure 31 – Indicator from table above in chart



Source: Polish rail transport office

When analyzing the accident rate, it should be pointed out that in order to improve safety, it is necessary for all parties to cooperate, both those running rail traffic and providing products and services for this market. The safety level is adversely affected by periods of disturbance of the railway system during investment works and the influence of third parties on the railway which is still at a very high level. In 2017, the President of UTK carried out activities involving raising awareness of both railway market entities, service and goods providers, but above all people crossing the tracks in a dangerous or even illegal manner. This was done by participating in social campaigns, organizing meetings of the Task Force for monitoring the level of safety of the railway sector in Poland, promoting a safety culture as well as stimulating participants of the railway market to implement solutions, often innovative, improving the level of safety in rail transport. One of the actions taken is the program to improve safety at rail and road crossings.

7.5.3. Slovakia

Within ŽSK, road and rail transport is operated exclusively and conditions for water transport are not created. Road and rail transport have different reasons and places for traffic accidents and will therefore be analyzed on a case-by-case basis in order to make it easier to define measures that can lead to increased safety for road users.

Road traffic:

Road traffic accidents have a long-term upward trend resulting from an increase in the total number of means of transport on roads and an increase in the utilization of roads resulting from the total congestion.

Table 84 – Accident on road network in Žilinsky selfgoverning region

	2015	2016	2017	2018	2019
Total number of accidents	1 970	1 993	2 152	2 094	2 053
Number of killed	54	39	34	30	33
Severely injured	176	173	187	239	185
Lightly injured	803	816	761	785	792
Material damage in Euro	6 286 330	6 521 040	6 489 740	6 872 980	7 534 980

The total number of accidents is fluctuating due to various external influences that directly interfere with the likelihood of an accident, such as fog, number of days with permanent snow cover, and the like.

Table 85 – Share of accidents at railway crossings in relation to all accidents in Žilinsky selfgoverning region

	2015		2016		2017		2018		2019	
	Number	Share in %	Number	Share in %	Number	Share in %	Number	Share in %	Number	Share in %
Total number of accidents	18	0,91%	29	1,46%	43	2,00%	41	1,96%	56	2,73%
Number of killed	0	0,00%	0	0,00%	1	2,94%	1	3,33%	0	0,00%
Severely injured	1	0,57%	1	0,58%	3	1,60%	4	1,67%	3	1,62%
Lightly injured	0	0,00%	4	0,49%	4	0,53%	6	0,76%	8	1,01%
Material damage in Euro	80900	1,29%	51180	7,85%	129800	2,00%	136780	1,99%	487260	6,47%

The share of road accidents in relation to the total number of accidents in Žilinsky selfgoverning region has an oscillating character, which is 2%. Therefore, the main place of origin is infrastructure outside the crossing, although it can be said that, given the precentual proportion of the length of the crossing to the total length of roads in the region, the probability of a crossing accident is significantly higher than that of other road infrastructure.

Rail traffic:
ŽSR keeps statistics for the whole Slovakia and does not distinguish which region it is, for this reason the data in the table below are given for the whole territory and are not fully comparable with the data that would apply exclusively to the Žilinsky selfgoverning region. Nevertheless, it is possible to identify the main trends and compare road and rail transport in general.

Table 86 – Accidents in rail transport

Type of accident / consequences of accidents	2015	2016	2017	2018
Train collision	12	3	14	19
Train derailment	5	5	2	6
Level crossing accidents	55	38	50	48
Fire in a railway vehicle	7	7	10	15
Injury causing by moving of railway vehicle	127	108	120	112
Accidents within shunting	38	31	36	45
Death of level crossing users priecestí	13	5	5	15
Death of unauthorized persons	101	80	92	85
Death of employees	2	2	1	0
Death of passangers	0	0	1	1

As can be seen, the largest share of accidents is due to crossings where the center of road and rail traffic and people who do not directly participate in the transport process or who are employed by the railway undertaking. In terms of mitigation of accidents, the most important tool is to ensure significant level crossings, especially on the main line, which is currently being implemented by abolishing the level crossing of road and railways when

implementing modernization of lines. Given the high number of crossings (2088 in 2018), it is financially difficult to secure a large number of crossings through a barrier system, which is used on main lines and on a road with a high intensity of road and rail traffic.
Currently, the project for the implementation of LTE in the Galanta - Nové Zámky - Šahy section is under preparation, where a camera system will be installed on selected roads to increase traffic safety and to quickly identify potential collision situations before their occurrence. This is the first project to be implemented due to the wide communication channel provided by LTE technology while maintaining a fast network response and the possibility of further expanding the services provided on the infrastructure concerned.

7.6. Saving quality transport routes

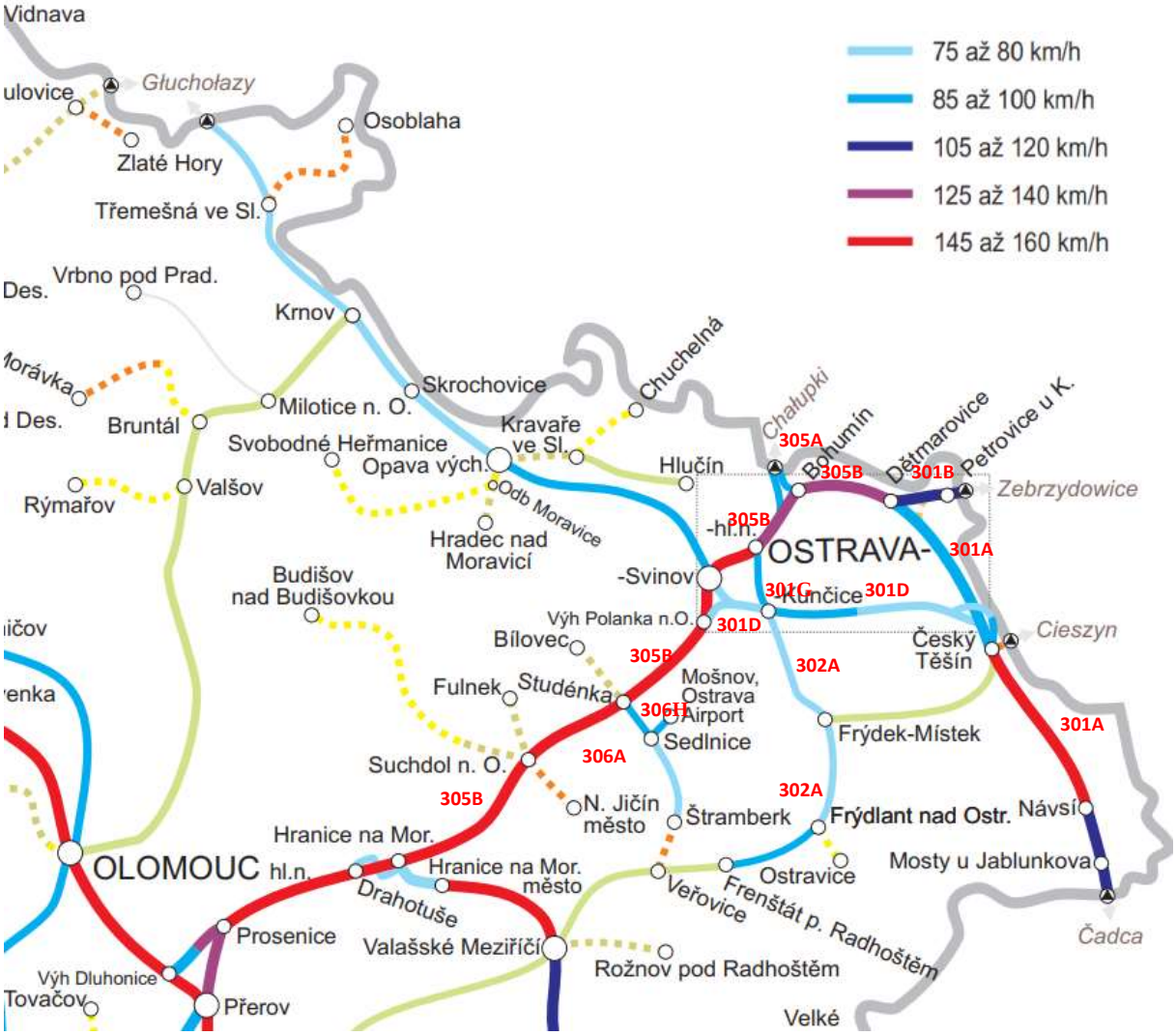
7.6.1. Czech republic

Factors which are a prerequisite for the transfer of goods from road to rail:

- on the infrastructure of SŽ - maintained sufficiently long handling tracks designed as VNVK (generally loading and unloading) equipped with either modern ramps or new warehouses with ramps, iron equipment.
- stations using modern loading and unloading mechanisms for the construction of new production plants within industrial zones (located near existing railway lines) with a suitable type of goods and its sufficient volume for transport by rail - construction of sidings,
- construction of storage halls and logistics warehouses connected to sidings sufficient number of modern wagons for transporting eg pallet goods
- services of carriers at stations - ensuring the reloading of goods from the railway on the road and their collection and distribution to customers by road (this is ensured eg by ČD Cargo, a.s.)

On the main freight corridors (lines 301A Bohumin-Cadca, 305B Bohumin - Jeseník nad Odrou- (Prerov), 301D (Ostrava Svinov) - the Polanka - Cesky Tesin crossroad and lines important for cross-border transport (301B Detmarovice - Petrovice u K, 305C and 305A Bohumín - Chalupki) and side lines, which are important for the operation of KD terminals in Paskov (301G Ostrava hl.n. - Ostrava-Kunčice, 302A O.Kunčice-Valašské Meziříčí) and future operation of the KD terminal in Mošnov (306A Studénka - Veřovice and 305H Sedlnice - Airport Mošnov) in the MSK region are sinks at line speeds, insufficiently long tracks for long freight trains of 740 m (in perspective) and also shortcomings in the number of line tracks and their non-rolling.
Regulation 913/2010 / EU defines measures that will lead to the introduction of freight rail corridors with guaranteed routes of sufficient quality for freight trains.
Regulation 1315/2013 / EU defines several requirements for railway infrastructure, including the requirement for the possibility of running trains of 740 m on main networks. So far, the infrastructure has been designed for 616 m freight trains.

Figure 32 – Maximal track speed on railway network in Moravian-Silesian region



Source: Správa železnic

Table 87 – Line speed tables and their limitations

Line 301A Bohumín-Mosty u Jablunkova - Čadca

Sections	Description of limitation	Speed
(SK) st.hr. - Mosty u Jabl.st.hr.	3,681 (total lenght of the section) on which: 3,638	120 (according to TTP)
	0,043 (2.kolej směr Boh.)	80 (curve)
Mosty u Jabl.st.hr. – Návsí	12,512 (total lenght of the section) on which: 0,515	120 (according to TTP)
	11,997	100/ 95 (freight trains)
Návsí – Bystřice n. Olší	5,846 (total lenght of the section)	160 (according to TTP)
	on which: 5,081	150 (1.track – direction Mosty)
	0,765	120 (Pass.trains 1.track), 140 (freight trains)
Bystřice n. Olší – Třinec	7,014 (total lenght of the section) on which: 4,898 (direction Bohumín)	160 (according to TTP)

	0,521	140 (Pass.trains direction Bohumín) 130 (freight trains–direction Bohumín) 135 (Pass.trains direction Mosty) 120 (freight trains-direction Mosty)
	0,685	160 (direction Mosty) 135 (Pass. trains direction Bohumín) 120 (freight trains–direction Bohumín)
	0,91	150 (Pass.trains direction Bohumín) 140 (freight trains–direction Bohumín–curve)
	5,808	150 (Pass. trains direction Mosty) 140 (freight trains–direction Mosty)
Třinec – Český Těšín nákl. nádr.	7,389 (total length of the section)	160 (according to TTP)
	on which: 0,25	70 (1.track - direction Mosty), 100 (2. track - direction Bohumín)
	4,365	120 (both tracks)
	0,303	70 (2.kolej)
	2,354 (2,464) 2,010 (freight trains)	140 (1. a 2.track), 130 freight trains
	0,420 (0,310)	80 (1. a 2.kolej)
Český Těšín - Chotěbuz	4,305 (total length of the section) on which: 3,867 (0.,1. a 2. track)	100 (according to TTP)
	0,438 (1. a 2. track)	70 (1. a 2. track)
	0,438 (0.track)	80 (0.track)
Chotěbuz – Louky n. Olší	2,075	100
Louky n. Olší – Karviná	8,090 total length of the section) on which: 2,095	100 (according to TTP) (maximal line speed)
	0,23	40 (undermined territory)
	5,185	50 (undermined territory)
	0,58	100
Karviná – Odb. Koukolná	4,100 (total length of the section) on which: 1,281	100 (according to TTP)
	2,819	50
Odb. Koukolná - Dětmarovice	2,596 (total length of the section) on which: 0,621 (2. track)	100 (according to TTP)
	0,809 (1.kolej), 0,188 (2.kolej)	60 (railway superstructure and substructure)
	1,787 (1.kolej), 1,617 (2.kolej)	50 (railway superstructure and substructure)
	0,170 (2.kolej)	30 (bridge -2. track direction Bohumín
Dětmarovice – Bohumín os.n.	8,452 (total length of the section) on which: 7,902 (1. track) 8,452 (2. track)	140 (according to TTP)
	0,550 (1. track)	60 (railway superstructure and substructure)

Line 305B Bohumín - Ostrava hl.n. - Ostrava-Svinov – Jeseník n. Odrou (hranice MSK)

Bohumín os.nádr. – Bohumín-Vrbice	3,912 (total lenght of the section)	140 (according to TTP)
Bohumín-Vrbice – Ostrava-Hrušov	2,611	140 (according to TTP)
Ostrava-Hrušov – Ostrava hl.n.	2,136 (total lenght of the section)	140 (according to TTP)
	on which: 1,798 (direction Bohumín), 0,280 (direction Přerov	
	1,518	100

	0,338	100 (direction Bohumín) 60 (direction Přerov)
Ostrava hl.n. – Ostrava-Mar. Hory zast.	2,409 (total lenght of the section)	160 (according to TTP)
	on which: 2,382	60
	0,027	80 (both tracks in front of Ostrava Mar. Hory station-railway superstructure)
Ostrava – Mar. Hory zast. – Ostrava vjezd. výh.	1,892 (total lenght of the section)	160 (according to TTP)
	on which: 1,48	80
	0,136	60 (bridge in front of the Ostrava Svinov station)
	0,276	100
Ostrava vjezd. výh. - Ostrava-Svinov	1,079 (total lenght of the section) on which: 0,930	160 (according to TTP)
	0,149	120
Ostrava–Svinov – výh. Polanka n.Odrou	3,956 (total lenght of the section) on which: 2,487 (2.track direction Bohumín, 2,775 (both tracks direction Přerov)	160 (140 freight trains) podle TTP
	1,469 (2.track direction Bohumín, 1,181 (both tracks direction Přerov)	120
Výh. Polanka n. Odrou - Jistebník	5,345 (total lenght of the section) on which: 3,980	160 (150 freight trains) podle TTP
	1,365	160 (140 freight trains)
Jistebník - Studénka	7,858 (total lenght of the section) on which: 1,064	160 according to TTP (Pass. trains direction Bohumín), 150 (Pass. trains direction Přerov)
	1,064	150 (freight trains podle TTP)
	6,794	150 (Pass. trains both direction) 140 (freight trains)
Studénka – Suchdol n.Odrou	12,010 (total lenght of the section) on which: 8,972	160 (according to TTP)
	1,228	140 (curve)
	0,998	160 ((Passenger trains) 150 (Freight trains)
	0,812	150 ((Passenger trains) 140 (Freight trains)
Suchdol n.Odrou – Jeseník n. Odrou	10,935 (total lenght of the section) on which: 3,164	160 (according to TTP)
	0,961	150
Jeseník n.Odrou - Polom (hranice MSK)	5,975 (total lenght of the section) on which: 1,030	160 (according to TTP)
	3,298	125 (120 freight trains)
	1,647	135 (130 freight trains)

Line 301G Ostrava hl.n. – Ostrava-Kunčice

Ostrava hl.n. (uhelné nádr.) – Ostrava střed	2,958 (celk. délka úseku)	100 (according to TTP)
	on which: 0,85	40 (curve)
	1,5	80 (curve)

	0,608	60 (curve)
Ostrava střed – Ostrava-Kunčice	4,847 (total lenght of the section) on which: 2,250	100 (maximal track speed)
	0,992	60 (curve)
	0,700 + 0,905	80

Line 302A Ostrava-Kunčice- Valašské Meziříčí

Ostrava-Kunčice - Vratimov	2,350 (total lenght of the section)	80 (according to TTP)
Vratimov - Paskov	4,265 (total lenght of the section) 4,265 (direction Ostrava Kunčice) on which: 4,142 (direction Frýdek-Místek)	80 (according to TTP)
	0,123	50 (direction FM - žst. Paskov – acces to tha platform)
Paskov – Lískovec u F.Místku	4,503 (total lenght of the section) on which: 3,188 (both directions) 0,762 (direction Frýdek-Místek), 0,639 (direction Ostrava Kunčice)	80 (according to TTP)
	0,013 0,136	50 (direction Frýdek-Místek) (direction Ostrava Kunčice)
	0,54	75 (both directions)
Lískovec u F.Místku – Frýdek-Místek	3,066 (total lenght of the section) on which: 1,045	80 (according to TTP)
	1,532	70
	0,489	40 (in front of the Frýdek-Místek station) - curve

Line 301D Český Těšín - Ostrava-Kunčice - výhybna Polanka /(Ostrava Svinov)

Český Těšín – Odb. Chotěbuz	4,305 (total lenght of the section)	100 (1.track), 80 (2.track)
Odb. Chotěbuz – Albrechtice u Č.T.	6,383 (total lenght of the section)	80 (according to TTP)
Albrechtice u Č.Těšína - Havířov	8,439 (total lenght of the section)	80 (according to TTP)
Havířov – Ostrava - Bartovice	5,836 (total lenght of the section) on which: 3,052 + 1,416 (Os vlaky) 0,930 (nákl.vlaky)	100 (according to TTP)
	0,391 /0,391	80 (Pass. and freight trains)
	0,506/0,506	60 (Pass. and freight trains) (bridge in front of the Havířov station)
	4,009	90 (Freight trains)
	0,471	95 (Pass. trains - curve)
Ostrava-Bartovice – Ostrava-Kunčice	5,522 (total lenght of the section) on which: 2,157 (direction Poland), 2,737 (direction Český Těšín)	100 (according to TTP)
	0,730 (direction Poland), 0,592 (direction Český Těšín)	100 (Pass. trains)/ 90 (freight trains)
	2,635 (direction Poland), 2,193 (direction Český Těšín)	80
Ostrava–Kunčice – Ostrava-Vítkovice	3,563 (total lenght of the section)	80 (according to TTP)
Ostrava-Vítkovice – odb. Odra	3,513 (total lenght of the section)	80 (according to TTP)
Odb. Odra – výh. Polanka n.Odrou	2,203 (total lenght of the section)	80 (according to TTP)

Line 305A (Chalupki PKP) - Bohumín st. hr - Bohumín

Bohumín st. hr. (PL) – Bohumín	3,136 (total lenght of the section) z toho: 2,567	100 (according to TTP)
	0,567	60

Line 305C (Chalupki PKP) - Bohumín Vrbice st. Hr - Bohumín Vrbice

Bohumín-Vrbice st. hr. (PL) – Bohumín-Vrbice	4,279 (total lenght of the section) on which: 1,924	100 (according to TTP)
	2,355	60

Line 301B Dětmarovice - Petrovice u Karviné

Petrovice u K.st.hr. – Odb. Závada	5,734 (total lenght of the section) z toho 0,732	120 (according to TTP)
	1,53	90 (railway superstructure)
	0,215	65 (elevation)
	3,257	120
Odb. Závada - Dětmarovice	2,508 (total lenght of the section) on which: 0,068	120 (according to TTP)
	2,44	110

Line Odb. Koukolná – Odb. Závada

Odb. Koukolná – Odb. Závada	2,653 (total lenght of the section)	60 according to TTP (limited to 40)

Line 306A Studénka - Sedlnice

Studénka – Sedlnice-Bartošovice	4,840 (total lenght of the section)	100 (according to TTP)
	on which: 1,004	50
	0,586	60
	0,52	70
	2,73	100
Sedlnice-Bartošovice – Sedlnice výh. č.1	1,689 (total lenght of the section) on which: 0,532	100 (according to TTP)
	1,157	95 (Passenger trains) 90 (Freight trains)

Table 88 – Track usable lenght tables

Line 305 B (Přerov) – Jeseník nad Odrou - Bohumín

Railway station	Number of tracks	Usable track length	Proposed construction measures
Bohumín			
Ostrava hl.n.	Passenger station area - 13 long tracks (601-882 m) Right station area - 16 long tracks (659-999 m) Left station area - 15 long tracks (9 transport 718-824 m , 14 handling 668-866 m)	has enough tracks that are not used Passenger station area - 6 tracks fit the lenght Right station area - 10 transport and 3 handling tracks fit the lenght Left station area - 4 transport and 5 handling tracks fit the lenght	triple-track section Ostrava-Svinov - Ostrava hl. n. and the construction of a rearrangement to increase the capacity of the line - the study Modernization of railway node Ostrava

Ostrava - Svinov	11	Complies with restrictions (only 3 tracks)	Reconstruction of the section will be proposed Ostrava-Hrušov – Ostrava-Svinov within Rekonstruction of Ostrava railway junction
Polanka	6	not compliant	
Jistebník	4	not compliant (territorial conditions allow for their extensions)	it will not be reconstructed
Studénka	7 (Passenger station) + 5 (Freight station)	complies with restrictions (only 2 tracks nákladní nádraží), extensions of usable lenght would be difficult according to configuration of station	it will not be reconstructed
Suchdol. n. O.	6	complies with restrictions (only 2 tracks), extensions of usable lenght would be difficult according to configuration of station	it will not be reconstructed

červeně – vyznačeny délky kolejí, které nevyhovují

Line 301A Bohumín – Čadca

Railway station	Number of tracks	Usable track length	Proposed construction measures
Dětmarovice	6	compliant 4 tracks	
Karviná	5	compliant 4 tracks	
Louky n.Olší	6	compliants 1 tracks (před rekonstrukcí), žádná po rekonstrukci	no measures are proposed according to undermined area
Český Těšín	13 (assessed only freight station area)	compliant (3 tracks - 104, 105, 108 in freight station area)	no measures are proposed
Třinec	11	nevyhovují (3 the longest tracks about 700 m)	reconstruction is not recommended, complicated connection of large siding Třinecké železárny, a.s. (near the railway station Český Těšín)
Bystřice n.Olší	4	not compliant	built-up area around the railway station, no measures are proposed - it is not possible to extend the tracks
Návsí	6	not compliant (only track 1 compliant)	built-up area around the railway station, no measures are proposed - it is not possible to extend the tracks
Mosty u Jablunkova	4	not compliant	Difficult conditions - jablunkov bypass, no measures are proposed

Line 301 G Ostrava hl.n. – Ostrava-Kunčice

Railway station	Number of tracks	Usable track length	Proposed construction measures
Ostrava - Svinov	11	not compliant	no measures are proposed
Polanka nad Odrou	6	compliant	
Ostrava Vítkovice	4	compliant	
Ostrava Kunčice	15	compliant partly (only main tracks 1,3,5)	no measures are proposed
Ostrava Bartovice	9	7 tracks compliant	
Havířov	4	compliant	
Albrechtice u Č. Těšína	5	not compliant	no measures are proposed
Český Těšín	13 (assessed only freight station area)	compliant (3 tracks - 104, 105, 108 in freight station area)	no measures are proposed

Line 302 A Ostrava-Kunčice - Frýdek-Místek - (Valašské Meziříčí)

Railway station	Number of tracks	Usable track length	Proposed construction measures
Ostrava-Kunčice	15	compliant main tracks (1,3,5)	no measures are proposed
Vratimov	5	not compliant	no measures are proposed
Paskov	4	compliant track 2, and whole tracks 1+1a , 4+4a	no measures are proposed
Lískovec u Frýdku-Místku	4	not compliant	no measures are proposed
Frýdek - Místek	7	not compliant	no measures are proposed

Due to the aforementioned shortcomings, constructions of optimization of track sections and modernization of railway stations in order to eliminate the track sinks have been and will be implemented in recent years. speed, doubling of interstation sections, introduction of electrification and ETCS systems, extension of rails in stations, construction of new security systems. equipment in stations and lines, etc.

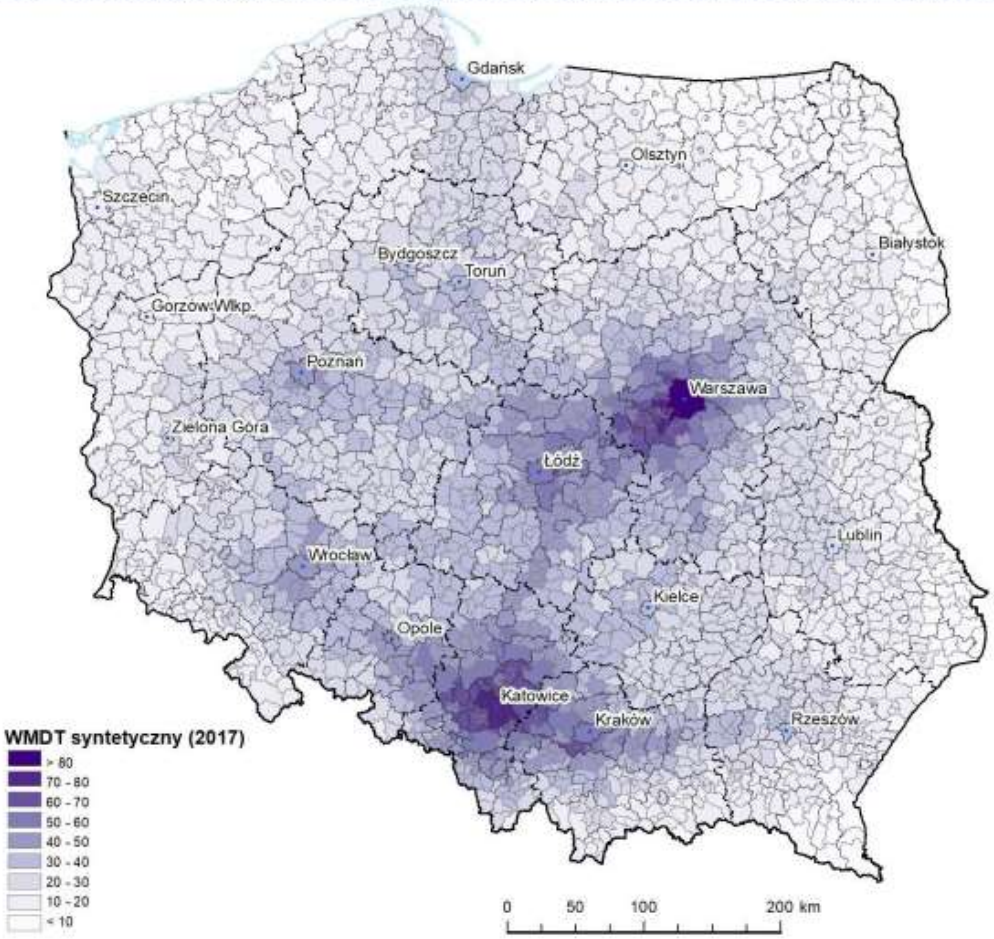
7.6.2. Poland

The length of the railway network in 2018 amounted to 19.2 thousand km (of which 11.4 thousand km are lines of national importance) and was 26 km longer than the last year. The PKP network was extended by 23 km (total length – 19.0 thousand km) and the railway network managed by other entities has not changed and amounted to 271 km. The electrified lines accounted for 61.8% in the total length of operated standard and large gauge railway lines. In 2018, 1 174 km of tracks (running tracks and the main tracks) were modernized, of which 602 km tracks were adjusted to the speed of 120–160 km. In 2018 on the railway network there were 1 338 stations, of which 398 junction stations (in 2017 – 1 173, of which 209 junction stations) and 635 active train stations (580 managed by PKP and other rail infrastructure managers and 55 railway stations managed by the community).
Inventory number of stock of electric and diesel locomotives amounted to 3.9 thousand units, which is 1.6% more than in 2017. Inventory number of freight wagons increased by

294 units and amounted to 88.0 thousand units. In the passenger transport both the inventory number of electric railcars and diesel railcars decreased, respectively by 27 and 10 units.

The overall picture of transport accessibility in Poland can be presented using the potential accessibility indicator, i.e. the inter-branch transport accessibility index (WMDT), which is the resultant of the situation in various modes of transport. This indicator - monitored by the Institute of Geography and Spatial Development of the Polish Academy of Sciences at the request of the office supporting the minister competent for regional development - is a good tool for illustrating the effectiveness of ongoing investments.
The survey indicates that the best inter-branch transport accessibility in 2017 was recorded in Śląskie, Mazowieckie, Łódź, Opolskie and Małopolskie voivodships (Figure 9). A similar situation took place in 2007, with the then order as follows: Śląskie, Małopolskie, Mazowieckie and Łódź voivodships.

Figure 33 – road availibility indicator in Poland value in 2017

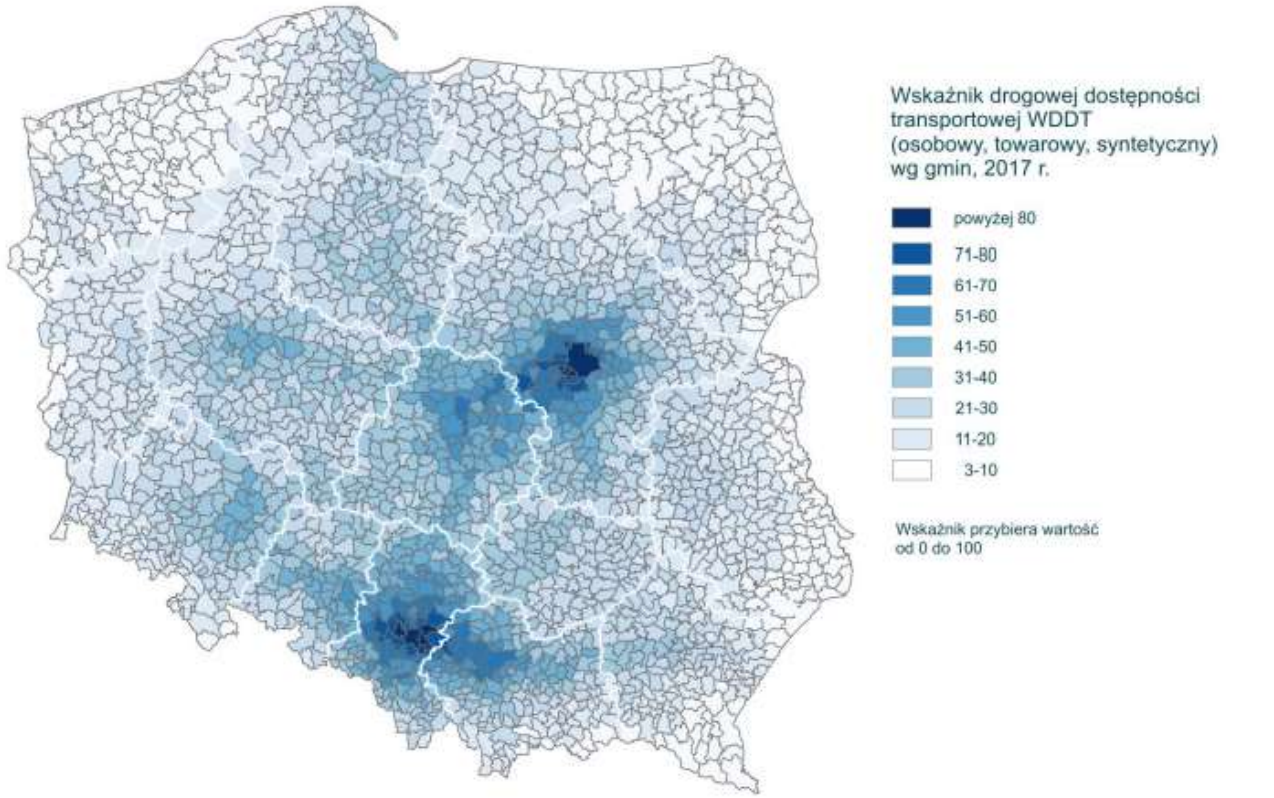


Źródło: Komornicki T., Rosik P., Stępniak M., Goliszek S., Kowalczyk K., 2017, Oszacowanie oczekiwanych rezultatów interwencji za pomocą miar dostępności transportowej dostosowanych do potrzeb dokumentów strategicznych i operacyjnych dot. perspektywy finansowej 2014-2020 (aktualizacja), Instytut Geografii i Przestrzennego Zagospodarowania Polska Akademia Nauk na zlecenie Ministerstwa Inwestycji i Rozwoju, Warszawa, 110.

Despite the significant increase in the length of expressways and highways in recent years, their network does not cover all voivodship cities. In 2017, 13 out of 18 voivodship

cities were connected by expressways or highways. In 2017, the road network in Poland was characterized by the existence of two poles with the best road accessibility: Warsaw-Łódź and Kraków-Upper Silesia, diverging along the A2 and A4 motorways. The change of road accessibility was also affected by the A1 motorway, contributing to a significant improvement in the accessibility of the Tri-City. Dense areas with clearly less regional road accessibility were found in Central Pomerania, north-eastern extremities and along the eastern border of the state.

Figure 34 – road availibility indicator in Poland target value



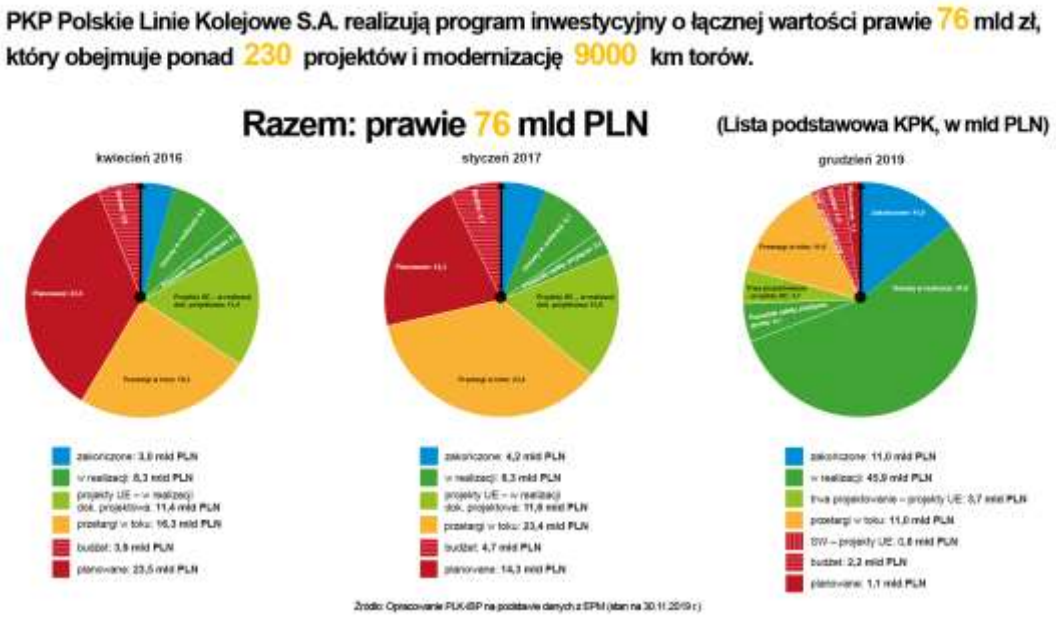
Źródło: Komornicki T., Rosik P., Stępniak M., Goliszek S., Kowalczyk K., 2017, Oszacowanie oczekiwanych rezultatów interwencji za pomocą miar dostępności transportowej dostosowanych do potrzeb dokumentów strategicznych i operacyjnych dot. perspektywy finansowej 2014-2020 (aktualizacja), Instytut Geografii i Przestrzennego Zagospodarowania Polska Akademia Nauk na zlecenie Ministerstwa Inwestycji i Rozwoju, Warszawa, 110.

A slightly different spatial picture is obtained by analyzing rail access to regional centers in 2017. Although the length of rail lines is relatively high compared to other EU countries, most major agglomerations are not connected by a network enabling passenger trains to travel at an average technical speed of over 160 km / h. In 2017, 8 out of 18 voivodeship cities were connected by railway lines modernized to at least the average speed of 100 km / h43 passenger trains43. The compact area with relatively good railway accessibility parameters covers the majority of central, southern and western Poland. The biggest changes in rail accessibility are visible in connections between major urban centers, especially between Warsaw and Gdańsk, Łódź and Katowice / Kraków, as well as between Wrocław and Katowice.

The condition of the national railway infrastructure, despite numerous investments carried out in recent years, still requires further improvement. In 2011-2017, it was possible to

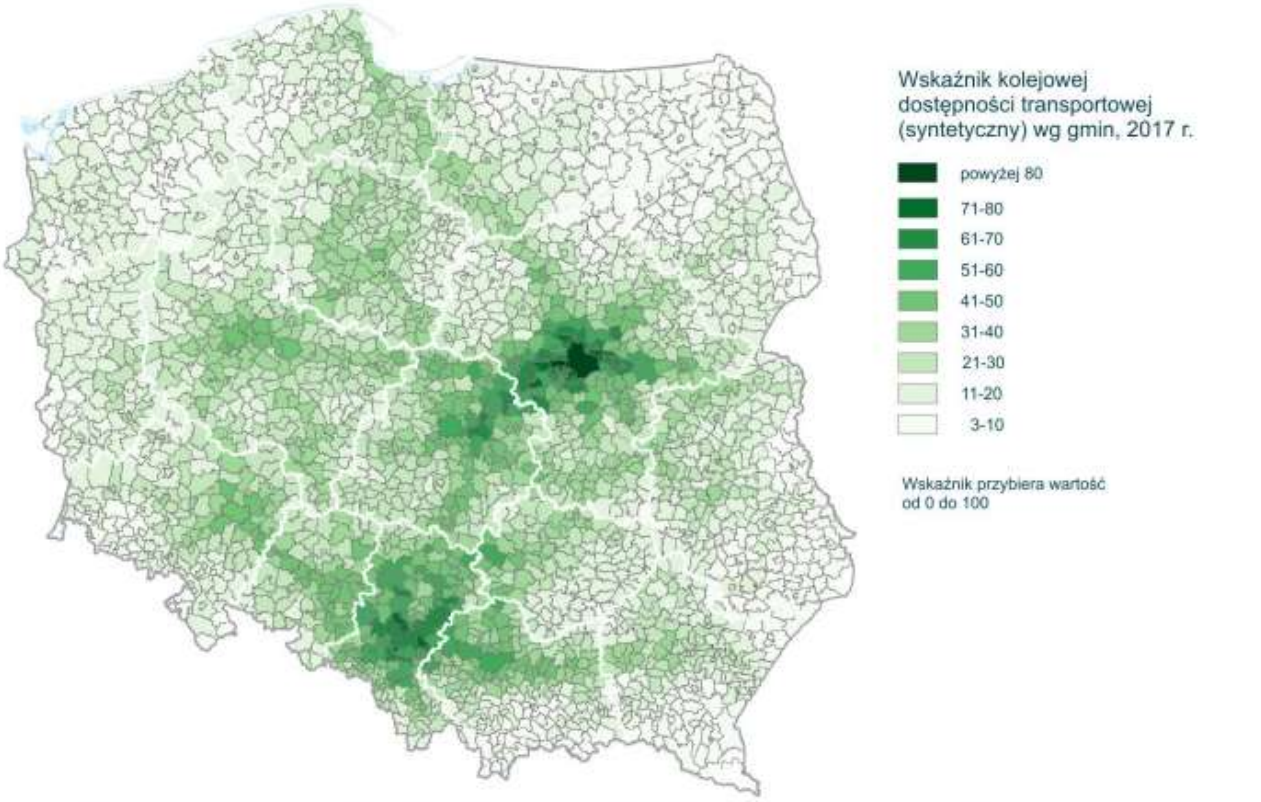
increase the proportion of the rail network in good condition from 36% to 55%. During this period, the railway network on the length of 4 636 km was modernized, which allowed, among others for increasing the speed for modern long-distance passenger trains to 200 km / h (on 135 km of railway lines).
Infrastructure deficiencies, as well as insufficient capacity, insufficient rolling stock parameters (speed, power, dynamics) and improper organization of traffic resulted in irrational lengthening of train paths, which in consequence resulted in a decrease in railway competitiveness on many routes, and often a total inability to offer an attractive transport offer.

Table 35 - PKP PLK expenditures on investments in railway lines 2016 -2019



As a result of maintenance and repair works and investment tasks carried out in 2016, the length of railway track tracks managed by PKP PLK SA with a good technical condition assessment (as at December 31, 2016) accounted for 55.1% of the total length of tracks, which means an increase of 0.6 percentage points compared to the state as at December 31, 2015, good grade was then obtained by 54.5% of tracks, while the length of tracks with unsatisfactory rating decreased by 2.7 percentage points. (at the end of 2016 it was 15.6%, and at the end of 2015 - 18.3%).

Figure 36 – railway availibility indicator in Poland value in 2017



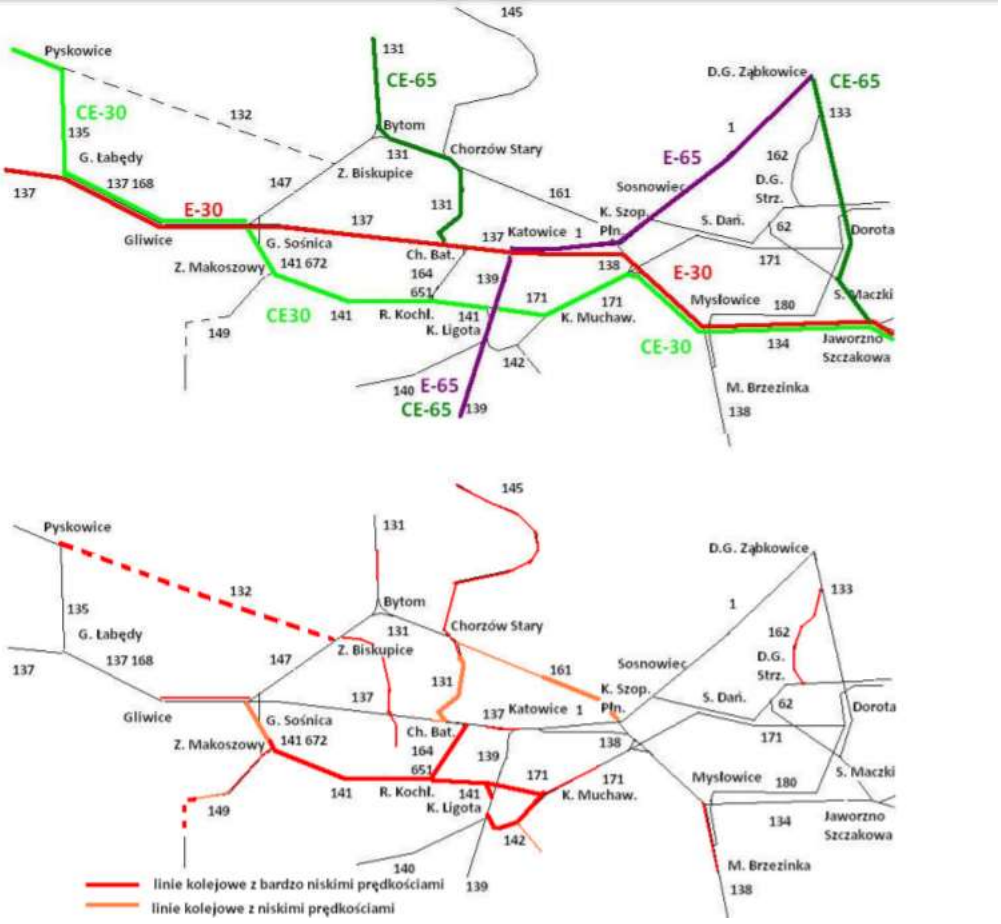
Źródło: Komornicki T., Rosik P., Stępniak M., Goliszek S., Kowalczyk K., 2017, Oszacowanie oczekiwanych rezultatów interwencji za pomocą miar dostępności transportowej dostosowanych do potrzeb dokumentów strategicznych i operacyjnych dot. perspektywy finansowej 2014-2020 (aktualizacja), Instytut Geografii i Przestrzennego Zagospodarowania Polska Akademia Nauk na zlecenie Ministerstwa Inwestycji i Rozwoju, Warszawa, 110.

Figure 37 – Railway line speed in Poland value in 2017

In 2017, speeds from 120 to 160 km / h were achievable on approximately 15% of the length of railway lines, including on the vast majority of the Terespol-Warsaw-Kunowice section (state border), Warsaw-Gdańsk, Central Railway Main Line, as well as the section

Zgorzelec-Opole. In 2017, trains could be run at speeds of 80 to 120 km / h on over 43% of the length of lines in use.
At around 41%, maximum speeds of up to 80 km / h11 were in force. The length of railway lines adapted to the speed exceeding 160 km / h, however, currently constitute less than 1% of the length of all lines. At the same time, the liquidation of many railway lines caused space restrictions in access to rail transport.
An important element of the Polish railway infrastructure are cross-border broad-gauge sections of railway lines, in particular the 395-kilometer Wide-Gauge Metallurgical Line which is the westernmost element of broad-gauge infrastructure in Europe.
The Śląskie Voivodeship is characterized by a high density of the railway network, but insufficient investment in infrastructure leads to very low speed limits, decommissioning of individual tracks or entire sections of the line. Excluded are also sections representing rail vehicle stops. As a result, freight and passenger transport are focused on main lines, which increases the risk of congestion. Low driving speeds encourage theft of goods directly from trains (eg coal dumps) and problems with traveling through the Upper Silesia region reduce the predictability and thus the competitiveness of rail transport, especially intermodal. The current problems of coal companies are also affected by uncompetitive travel times for coal freight trains and downtime due to low railway capacity. The Katowice railway junction lies at the junction of the trans-European transport corridors and the efficiency of these corridors depends on its throughput.
During the stakeholder meeting organized by UTK in Katowice in February 2014, carriers also reported the problem of numerous point speed restrictions and allowable axle load (culverts, bridges, crossings, worn sleepers, switches). Therefore, it seems reasonable to analyze point restrictions, classify them (set priorities) and estimate the costs of decommissioning. In the event of abandonment of investment works, point constraints will constitute network bottlenecks. The Implementation Document for the Transport Development Strategy until 2020 and the ROP of the Śląskie Voivodeship do not include a program aimed at eliminating these barriers. The carriers expressed the view that the poor condition of the infrastructure is a barrier to the modernization of rolling stock. They also appealed for the preparation of alternative routes and extending the work of posts against the planned numerous track closures. The developed road infrastructure is already proving to be an alternative to rail transport, which may lose customers, which in turn will negatively affect the financial result of the rail infrastructure manager.

Figure 38 – Railway node Katowice, lines with low speeds are colored

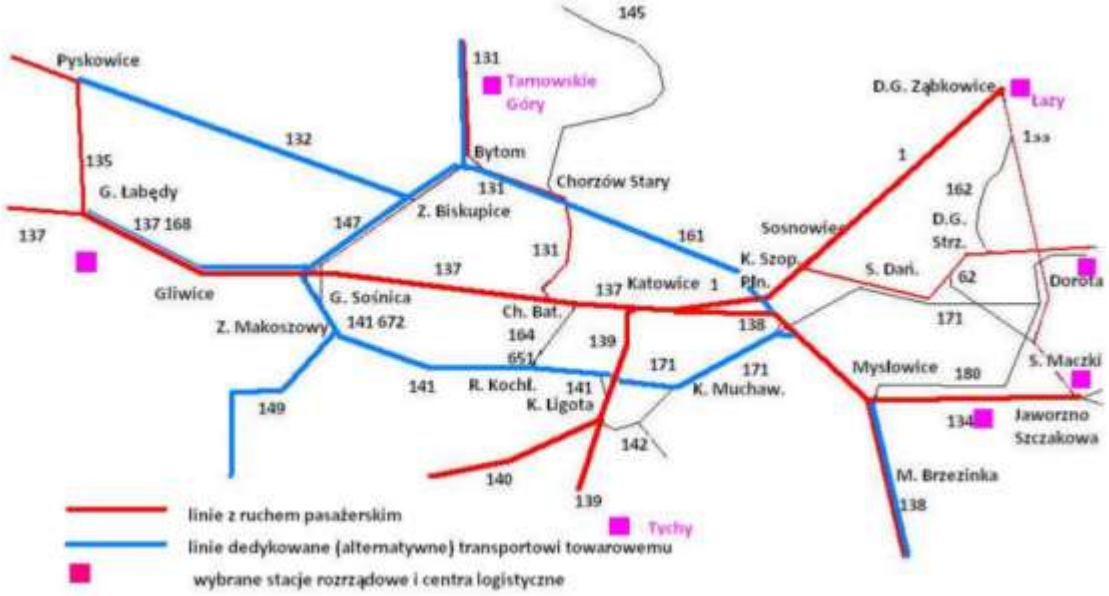


The solution to the problem of the growing demand for bandwidth for different types traffic is, as in the case of the Tri-City, their separation, which is also favorable separation of dangerous goods transport routes. To this end, consideration should be given increasing the planned scope of investments by revitalizing the lines that were in a preliminary feasibility study for the modernization and expansion of the Katowice Node Station.

The following lines could constitute freight bypasses for the main ones bus:

- line 132 on the section Pyskowice - Zabrze Biskupice, which allows bypassing the Gliwice station and forming, along with the sections to be modernized, Zabrze Biskupice - Bytom, Bytom - Chorzów Stary (line 131) and Chorzów Stary - Katowice Szopienice (line 161) the northern beltway;
- line route 149 - 672 - 147 - 188 - 165 (Leszczyny - Bytom) constituting the western variant of the 5th transport corridor;
- a series of lines 141 and 171 constituting the southern beltway of the cross-city line 137;
- railways 164 and 651 which may constitute a strictly freight part of the CE-65 corridor.

Figure 39 – Railway node Katowice, passenger line in red, freight lines in blue, freight centres in purple



7.6.3. Slovakia

Table 89 – List of internatiol corridor lines in Žilinsky self-governing region

Track	Corridors	Total length (km)	Description
105A Border of the Žilina region (Košice) – Kraľovany	**OSŽD, RFC 9, TEN-T Core (Rhine – Danube)**	**80,741 km**	**- Gauge 1435 mm; - Traction 3kV DC - Axle load category D4 - Max speed 100 or 120 km/h - Number of tracks 2 - Maximal train length 650 m**
106A Kraľovany – Žilina – border of the Žilina region (Púchov)	**OSŽD, RFC 5, RFC 9, RFC 11, TEN-T Core (Baltic Adriatic, Rhine – Danube)**	**61,467 km**	**- Gauge 1435 mm; - Traction 3kV DC - Axle load category D4 - Max speed 40 km/h (Žilina station), 100 km/h or 120 km/h - Number of tracks 2 - Maximal train length 650 m**
106D Žilina – Čadca – Mosty u Jablunkova (CZ)	**OSŽD (Žilina – Čadca), RFC 5, RFC 11, TEN-T Core (Rhine – Danube)**	**36,940 km**	**- Gauge 1435 mm; - Traction 3kV DC - Axle load category D4 - Max speed 80 km/h, 100 km/h, 140 km/h - Number of tracks 2 - Maximal train length 700 m**
114B Čadca – Skalité – Zwardoň (PL)	**OSŽD, TEN-T Core (Baltic Adriatic)**	**20,226 km**	**- Gauge 1435 mm; - Traction 3kV DC - Axle load category D4 - Max speed 70 km/h, 100 km/h - Number of tracks 1 (Svrčinovec – Skalité) - Maximal train length 650 m (only on Slovak side)**

The maximum speeds indicated are valid for both passenger and freight transport on the sections concerned. The train lengths are defined on the basis of the length of the transport and handling tracks on the line concerned. Their length does not change during modernization due to sufficient length with respect to the trains that are operated in our territory and comply with the European legislation for the modernization of the main railway corridors.
In these sections, selected stations are used for overtaking with sufficient length and a number of traffic and handling tracks, respectively, of sufficient length to safely stop freight and passenger trains respectively. It is also possible to include the Žilina establishment station in regular stations, where longer delays are expected, resulting from the fulfillment of the expected train traffic graphic.

Figure 40 – Freight corridors lines in Žilinsky self-governing region

The map above shows all the main freight routes that pass through the territory of the Žilina self-governing region and the individual corridors are color coded.
All these freight corridors are also part of the TEN-T network and are the main routes where EU funds are invested to modernize the railway infrastructure. From all the infrastructure, the sections Žilina - Púchov (border of the region) and Žilina - Krásno nad Kysucou are currently modernized.

7.7. Creation and capacitating of reloading points

7.7.1. Czech republic

Terminal Paskov (AWT, a.s.)
was founded in 2007, when in the years 2008-2009 was the first stage and in 2011-2012 II. extension and modernization stage. In February 2018 was launched III. Phase of modernization of the Terminal, within which the handling area was doubled to 70,000 m 2 and capacity to 4,800 TEU and the construction of 2 new tracks with a length of 375 m. During the modernization phase, it was CZK 230 million of which EU subsidies amounted to CZK 151 million. The entire modernization will be completed in 2020 by the reconstruction of the adjacent railway siding and the adjustment of 4 rails to a length of 750 m, which will enable the acceptance of complete container trains.
The Terminal currently serves 10 large customers, including Maersk, MSC, COSCO, EKOL and LKW Walter. At present, approximately 14,000 container and semi-trailer handling operations are carried out per month.
It is already planned IV. phase of the modernization and extension of the terminal, which should start in July 2019 with the demolition of the adjacent buildings of the former Paskov mine. The expected completion of demolition should take place by the end of 2020, when the handling area will be increased by approx. m2 and will serve as a parking area for road trailers.
Further modernization, expansion and strengthening of handling areas will require subsequent investments. After completion of IV. stage will have a final area of 150 thousand. m2. At the same time, another terminal handling track with a length of 400 m, which is now part of the railway siding, will operate here and the terminal will reach a total capacity of 10,000. TEU.

Terminal Senov u Havirova (companies Metrans, a.s.)
The terminal was established in 2011 on the premises of the former siding of the concrete plant, which was no longer interested in operating it. The siding is connected to the double-track electrified line No. 301D in the connecting station Havířov, which is connected to the II. and III. transit corridor. Metrans (owner) serves this terminal with KD links connected to the terminal in Ceska Trebova and there is a possibility to connect it with the terminal in Dunajska Streda (for a list of lines see below).
The terminal is easily accessible by road - connected to the road II / 479 to the road I / 11 (four-lane road through Ostrava in the west-east direction).
It is equipped with 4 rails (1-4) - lengths 925 m, 372 m, 351 m, 321 m.
The inner area of the transhipment area is 40,000 m2.
Storage area for IPU in m2 or TEU (within reach of portal cranes) - 400 TEU
Storage area for IPJ in m2 or TEU (out of reach of portal cranes) - 20 000 m2.
(capacity 5000 TEU)
In 2018, the terminal area was expanded by 30%.
Prospectively, in the framework of the reconstruction of the Havířov railway station, it is considered that they will have at their disposal 3 handling tracks in the Havířov railway station with a length of about 700 m.
Other areas for storage of empty containers are located in another location in Šenov - VOKD.
Theoretical transhipment volume / actual transhipment volume - 180 000/90 000 TEU
The number of railroad operators is 6 operators / 24 h.

Equipment with reloading mechanisms - gantry crane Kalmár - load capacity 40 t,
2 pcs TFC 45 h - load capacity 45 t, 4 pcs F248 - load capacity 10 t.

Directions:
Havirov - Ceska Trebova, operator Metrans
Havirov - Koper, operator Metrans
Havířov - Poland (Dambrowa Górnocza, Gadki etc.)
Some trains run across Poland further to Kazakhstan (via Brest).
At present, they operate 3 trains a day, consisting of 25 platform wagons1 for the transport of containers.

Terminal in Kopřivnice (ARGO Bohemia, s.r.o.)
The terminal was established in the district of the Kopřivnice railway station in 1998 and was transported by the Transport Division of Tatra, a.s. Later, the terminal was sold to Talosa, s.r.o. z Kopřivnice (manufactures prototypes of car parts, provides services for Tatra cars, a.s.) and then sold it to Argo Bohemia, sro (part of the Argo Group, a.s. based in Prague). The terminal consists of 2 generally loading and unloading tracks (No. 8 and 12) of 280 m and 150 m length.
Equipped with reloading mechanisms - gantry crane PD 38, side translator BP 35,
5t forklift, 3t forklift.
Capacity: 400 TEU, capacity can be increased if necessary

Directions:
Kopřivnice - Malaszewice / Brest to former USSR, North Korea, China, Afghanistan, (East Line train)
Kopřivnice - Malaszewice / Brest - Ulan Bátár (Mongolia), train Mongolian vector

These are compact groups of wagons with containers that are hung on trains at the Přerov railway station. traveling to Poland (Małaszewice / Brest) and further to the countries of the former USSR.

Terminal in Mosnov in bulding process
In the future, it is planned to build a siding and terminal KD in Mošnov, which should be connected to three modes of transport - road, rail and air. This locality was the only one that allowed to design sufficiently long tracks for freight trains of 740 m in a large undeveloped area (originally agricultural land), which other terminals (in Paskov and Havířov) do not meet yet because they are located in a built-up area. It was considered that it should have been public and allow non-discriminatory access to all subjects. Nearby is an industrial zone where car manufacturing companies have their production facilities. They are currently served by road transport.

Ostrava Airport Multimodal Park (OAMP)
The siding security device will only operate the rails in the container terminal (No. 201-206). These are 551-724 m track lengths. Track Nos. 205, 203 and 201 will enable entry and departure of shunting parts to the SŽDC network. The other tracks (Nos. 202, 204, 206) will be used for reloading containers, but can also be used for the entry and exit of displacement parts.
The rails 205, 203, 201, 201b, 220 will be railed in their full length. Partially (for bypassing

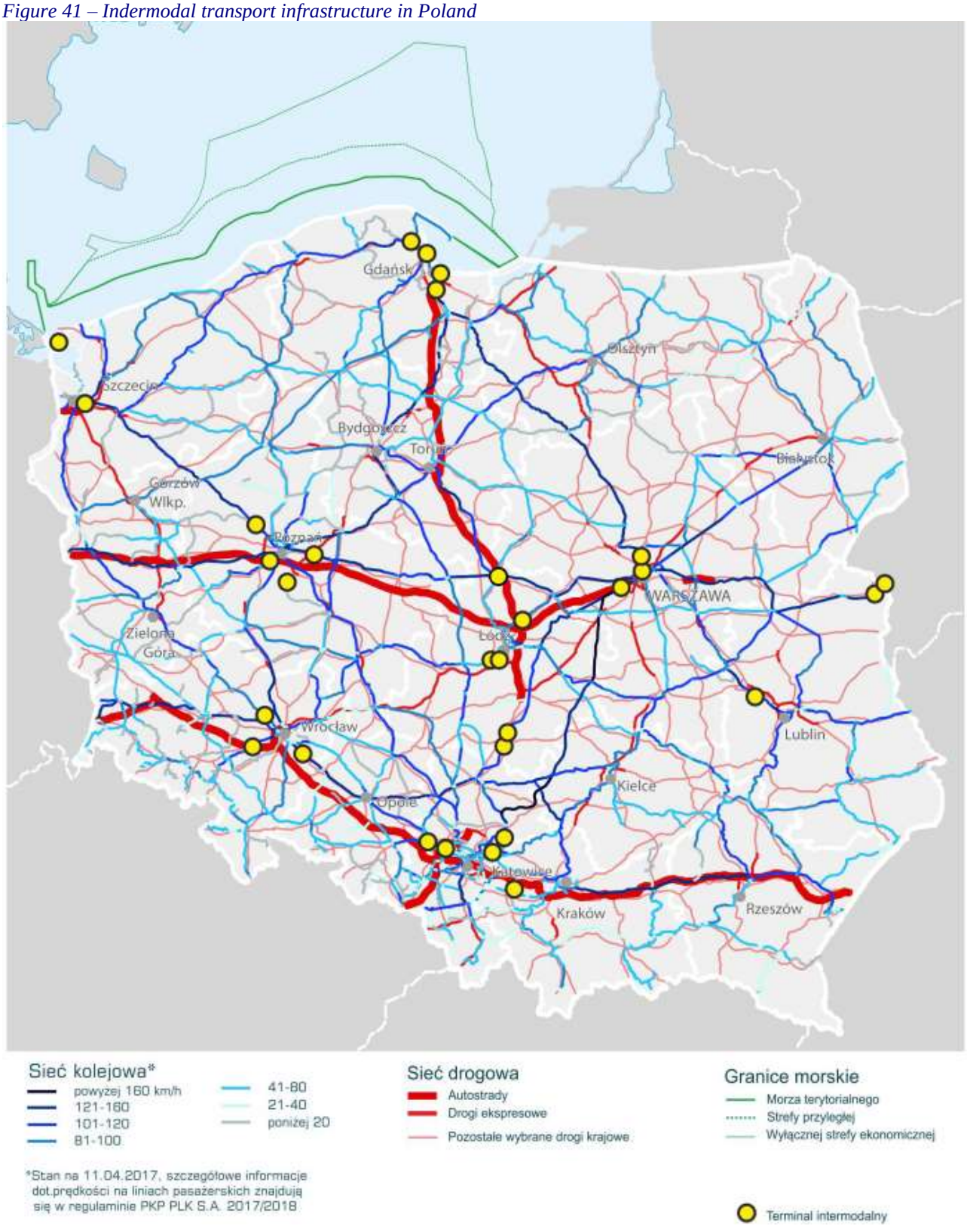
traction vehicles) rail no.
Rails 202, 204, 206 will be partially railed outside the gantry crane gantry. The middle sections will be gantry cranes without overhead lines.
The other 6 handling rails are equipped with a side ramp (No.232a, b, c) and (234a, b, c) and have a length of 132-210 m and shorter handling rails 232 a, b, c.
For the needs of the OAMP siding, it is assumed that up to 10 train pairs / day, ie 20 rail connections per day, are to be run. For this purpose, complete container trains for the KD terminal of 6 pairs / day, ie a total of 12 trains, and integrated trains consisting of 4 pairs / day of covered buildings, ie a total of 8 trains, will be transported for the purposes of the OAMP siding.

Multimodal cargo Mošnov (MCM)
The area will be equipped with a siding, but its design has not been processed. The region requires equipment with 5 halls, paved areas for transport services and parking, railway siding. In the Sedlnice railway station, the circumference of the triangle, a branching switch No. 301 was inserted to connect the siding. The siding circuit itself will consist of 3 - 4 non-electrified rails. The middle rails will be used for the entry and exit of shunting parts, bypassing traction units and a shunting assembly (useful length for forward vision - optimally 550 meters). The 2 outer rails will have side ramps for reloading goods from railway wagons to halls and vice versa. All tracks will be without traction lines. The siding circuit itself will not be secured by a security device. The changeover of switches will be handled manually by the shift manager or by another professionally qualified employee of the transporter.
For the needs of the MCM, it is assumed to run up to 2 pairs of trains / day, ie 4 rail connections per day.
Assumption - transport from the industrial zone Mošnov (from the sidings OAMP and MCM) will consist of freight trains in the direction to the south (Olomouc) and will account for approximately (80%), to the north 20% of the trains will be routed.
In July 2019 the first hall within the MCM Mošnov was completed and put into operation. By the end of 2019, additional logistics halls were built. At the latest in 2121, work will begin on the construction of the terminal. It should have been put into operation during 2022, otherwise there is a risk that the conditions for drawing EU subsidies for this construction will not be met.

7.7.2. Poland

In 2017, 30 rail container terminals existed in Poland (including rail-road terminals, terminals at the junction of 1520 and 1435 mm gauge and container terminals in seaports) for intermodal transport. Thanks to investments in intermodal terminals supported by the Cohesion Fund under the Operational Programs Infrastructure and Environment for 2007-2013 and 2014-2020, the network of intermodal terminals is systematically expanded. The average density per country is about 1 terminal per 10,000 km^2.

Figure 41 – Indermodal transport infrastructure in Poland



Large intermodal terminals are located in the regions of the largest agglomerations (Górnośląsko-Zagłębiowska Metropolia, Warsaw, Poznań, Wrocław, Łódź), in seaports (Gdańsk, Gdynia, Szczecin, Świnoujście) and on the border with Belarus (Małaszewicze). It is worth noting that the port of Szczecin is also an inland port. In turn, locations

potentially enabling the use of inland navigation as well as road and rail transport are, among others, in Wrocław, in Kędzierzyn-Koźle and Gliwice.

7.7.3. Slovakia

There are two fully functional intermodal reloading stations in the Žilina self-governing region. Both are located in or near the city of Zilina and currently provide sufficient capacity to cover requirements within the adjacent territory. Both terminals are connected to the railway network via a station head, in the case of a terminal located directly in Žilina, there will be a slight change in connection after reconstruction of the Žilina node, but the terminal will continue to be connected to the station head.

Table 90 – Intermodal terminals in Žilinsky self-governing region

Traffic modes	Location	Operator	Public/private	TEU per year	Connection
Railway/Road	Žilina	SKD Intrans, a.s.	Private	94 244	Railway station
Railway/Road	Žilina – Teplička	TIP ŽILINA, s.r.o.	Public	New	Railway station

Zilina Terminal is operated by Rail Cargo Operator - CSKD sro, a member of a multinational company operating in several European countries (Czech Republic, Germany, Austria, Hungary, Romania and others). There are two 425 m and 470 m handling rails in the terminal, which is not ideal as the trains are up to 700 m in length, so these trains need to be split into two sets and serviced sequentially, extending the handling time and overall occupancy of own tracks. The trains are served by two frontloaders and approximately 1,000 m2 of warehouse space is available. The current situation will not change even after the implementation of the project Node Žilina, which will modernize the connection of the terminal to other railway infrastructure, but the length of the rails will be preserved due to restrictive spur conditions, which do not allow the rail to extend to 650-700 m.
The terminal operator in Teplička is TIP Žilina, a subsidiary of Metrans Danubia, a.s. based in Dunajská Streda. The terminal has a total storage area of 11,500 m2, this area is located under two gantry cranes, which operate two handling rails with a useful length of 750 m. In total, up to 1,790 units can be stored in the current configuration. Both of the two gantry cranes can handle one container in 3 minutes, a theoretical performance of 480 units at a 12-hour shift. the beginning of the construction of the terminal.
There is currently no support program for intermodal transport within ŽSK.

7.8. Functionality of siding connections

7.8.1. Czech republic

The construction of sidings is very financially demanding and therefore their infrastructure was included in the OP Transport 2007 - 2013 under the Program of Support and Revitalization of Sides and financially subsidized from EU funds. Building siding is only worthwhile for larger companies with a regular large volume of products that are by their nature suitable for rail transport.
Small companies do not have the finances for the construction of siding and they would not be able to meet the conditions for drawing subsidies from EU funds for the construction of the siding, it will not pay them financially. In addition, companies are also hampering

operating rules, which stipulate that siding needs to be maintained even when there is no traffic. Trailers must do this either by themselves or by paying an external specialist company to carry out regular maintenance. In addition, they must ensure that the siding is regularly operated - ie. wagons are transported from the connection station on the SŽ network to the company premises (where the wagons will be loaded or unloaded). They operate the siding either by their own locomotives or they must be rented, including the driver.
Large sidings, which were established in large industrial enterprises (mostly mines in Ostrava and Karviná, ironworks in Ostrava, Třinec and Bohumín; Arcellor Mittal smelters and chemical plants in Ostrava, Bohumín, etc.) within the Moravian-Silesian Region before the revolution continued in the production and transportation of their goods even after the revolution. Long-term operation has been verified that they are working well and if this was not the case, appropriate measures were taken, whether on infrastructure. connection to the public railway network or in terms of connection technology (transfer of trains from the siding to the connection station and vice versa). Mostly the sidings are connected to double-track electrified lines. Only the PKP International (formerly AWT, a.s.) siding in Paskov is connected to a non-electrified track.
purchased by new owners and also changed the type of goods transported (eg siding and terminal in Šenov). Many sidings were canceled because they were not used. In the decision to issue an official permit of the Rail Administrative Authority, the siding owner / operator is obliged to operate and maintain the siding - they must maintain security. siding equipment even when not in operation.
The newly planned sidings already assess the rail capacity of the connection station (configuration and track lengths), track throughput (current and prospective) as well as the technology of their operation, and the best solution is proposed. This is also the case with the OAMP siding. KD terminal in Mošnov and MCM siding. Under the OP Transport 2007-2013, a siding support and revitalization program was prepared (see chapter 8.1.), Which supported the construction and revitalization of siding.

Table 91 – List of siding on the SŽ network in the TRITIA region

Name of siding	Connecting railway station	Rail operator
Bochemie chemie	Bohumín	Ing. Miloslav Šmíd
GENETRIX s. r.o.	Bohumín	Ing. Miloslav Šmíd
MS UTILITIES & SERVICES a.s.	Bohumín	ČD Cargo, a.s.
ŽDB DRÁTOVNA	Bohumín	ČD Cargo, a.s.
TSR Bohumín	Bohumín	Ing. Miloslav Šmíd
SANRE, spol. s r.o. – vlečka Bohumín	Bohumín	Slezskomoravská dráha, a.s.
Benzina, s. r.o., Sklad Nový Bohumín	Bohumín	Slezskomoravská dráha, a.s.
VADS BOHUMÍN	Bohumín	AWT ROSCO a.s.
Siding network OKD, Doprava, a.s. - siding Báňská	Bohumín	PKP International, a.s.
Bohumín terminál	Bohumín - Vrbice	
RSM Bohumín	Bohumín - Vrbice	
ROCKWOOL Bohumín	Bohumín odstavné nádraží	
Bohumín šrotiště	Bohumín odstavné nádraží	
Elektrárna Dětmarovice (EDĚ)	Dětmarovice	
JÄKL Karviná, a.s.	line Petrovice u Karviné – Karviná-Město	Arcelor Mittal Tubular Products Karviná a.s.

BuySell Trade, a. s. SALTAGRO a.s.	Petrovice u Karviné Petrovice u Karviné	Slezskomoravská dráha, a.s.
ČECOMET – Karviná KOVONA KARVINÁ, a. s.	Karviná hl. n. Karviná město	Slezskomoravská dráha, a.s. PKP International, a.s.
Siding network OKD, Doprava, a.s. - siding Báňská	Louky n. Olší	PKP International, a.s.
Báňská (Karviná Doly – důl ČSM sever)	Albrechtice u Č.Těšína	PKP International, a.s.
Nehlsen Třinec, s. r.o. Třinecké železárny, a.s. OKV Třinec	Třinec Třinec Třinec	Slezskomoravská dráha, a.s. Třinecké železárny, a.s. ČD Cargo, a.s.
DEKTRADE – Ostrava Hrušov H-Zone, s. r. o. – Hrušov DEKINVEST – Ostrava Hrušov, Heřmanice (area Hrušov) ODRA - Hrušov	Ostrava hl. n. – Hrušov Ostrava hl. n. – Hrušov Ostrava hl. n. – Hrušov Ostrava hl. n. – Hrušov	Slezskomoravská dráha, a.s. Slezskomoravská dráha, a.s.
ODRA – uhelná služba ODRA - základní závod TSR Ostrava – Přívoz Pošta Ostrava 02 SOKV Ostrava (repair shop of railway wagons) ČD, a.s. - Ostrava	Ostrava hl.nl. - osobní nádraží Ostrava hl.nl. - osobní nádraží Ostrava hl.nl. - osobní nádraží Ostrava hl.nl. - osobní nádraží Ostrava hl.nl. - osobní nádraží Ostrava hl.nl. - osobní nádraží	
Ridera Bohemia Ostravské opravny a strojírny, s.r.o. (into it is connected siding SOKV Ostrava) OKV Ostrava (next OKV) BorsodChem MCHZ, s.r.o. (into i tis connected siding Šverma into it is connected siding LIBROS)	Ostrava hl.n. - pravé nádraží Ostrava hl.n. - pravé nádraží Ostrava hl.n. - pravé nádraží Ostrava hl.n. - pravé nádraží	Slezskomoravská dráha, a.s. Ostravské opravny a strojírny, s.r.o. PKP International, a.s.
vlečka TROJEK into it are connected siding: VOKD a.s. divize 7, správa hmotného majetku Škubalová	Ostrava hl.n. - levé nádraží Ostrava hl.n. - levé nádraží Ostrava hl.n. - levé nádraží	Slezskomoravská dráha, a.s.
PORFIX Ostrava -Třebovice Dopravní podnik Ostrava a.s.	Ostrava-Třebovice Ostrava Třebovice	Slezskomoravská dráha, a.s. Slezskomoravská dráha, a.s.
Veolia Energie ČR - Třebovice RAVEN Svinov	Ostrava-Svinov Ostrava-Svinov	PKP International, a.s. VA Progres s. r.o.
Vlečka TSR Polanka Českomoravský štěrk, a.s., siding Polanka	Polanka Polanka	Ing. Miloslav Šmíd Českomoravský cement, a.s.
NAVOS, a.s. – siding Suchdol nad Odrou MSV Metal Studénka, a.s. VSMS Studénka NAVOS, a.s. – siding Studénka	Suchdol nad Odrou Studénka Studénka Studénka	JOANNES, s. r.o. VA Progres s. r.o. Ing. Petr Burian JOANNES, s. r.o.
TATRA TRUCKS a.s. KOTOUČ ŠTRAMBERK	Kopřivnice nákladové nádraží Štramberk	Zdeněk Valchář - VA Progres BPS-Prastav, s. r.o.

OKD Báňská (báňské nádraží) - důl Zárubek	Ostrava střed	
VÍTKOVICKÁ DOPRAVA (vlečka Vítkovice)	Ostrava střed	PKP International, a.s.
Liberty, a.s. (previously Arcellor Mittal, a.s.)	O.-Kunčice; O.-Bartovice	Arcelor Mittal Ostrava, a.s.
Linde Gas a. s. Výrobně distribuční centrum SC4 Ostrava Kunčice	Ostrava-Kunčice	Linde Gas a. s.
BE Group Logistics CZ	Ostrava-Kunčice	Slezskomoravská dráha, a.s.
STABRA CZ	Vratimov	VA Progres s. r. o.
Terminál KD Paskov		PKP International, a.s.
BIOCEL	Paskov	ČD Cargo, a. s.
ArcelorMittal Ostrava a. s. – F. Místek	Lískovec u Frýdku	ArcelorMittal Ostrava, a.s.
Hutní montáže, a.s. - Sviadnov	Lískovec u Frýdku	
Huisman Konstrukce, s.r.o. - Sviadnov	Lískovec u Frýdku	Slezskomoravská dráha, a.s.
SLEZAN Frýdek-Místek a. s.	Frýdek-Místek	STENO, v. o. s. – stavební a inženýrská činnost v kolejové dopravě
ARCIMPEX s. r. o. – Sviadnov into it are connected sidings:	Frýdek-Místek	ARCIMPEX s. r. o.
Dalkia Česká republika – F.Místek	Frýdek-Místek	
Hutní montáže, a.s. (into it is connected siding Huisman Konstrukce, s.r.o. – Sviadnov)	Frýdek-Místek	
AGRO a.s. (no in use)	Frýdek-Místek	
ČEZ Korporátní služby s.r.o, vlečka Žabeň	Frýdek-Místek	
Pivovar RADEGAST	Dobrá u Frýdku	Slezskomoravská dráha, a.s.
HMMC Nošovice	Dobrá u Frýdku	RAILLEX, a.s.
QC Company Investment s. r.o.	Dobrá u Frýdku	Slezskomoravská dráha, a.s.
Slezskomoravská dráha, a.s. Frýdlant nad Ostravicí	Frýdlant nad Ostravicí	Slezskomoravská dráha, a.s.
Siemens, s. r. o. – Frenštát p. Radhoštěm	Frenštát pod Radhoštěm	JOANNES, s. r. o.
Fa Strnadel – Frenštát p. Radhoštěm	Frenštát pod Radhoštěm	Slezskomoravská dráha, a.s.
Vítkovická doprava - Vítkovické železárny, a.s.	Ostrava - Vítkovice	
METRANS - Šenov	Havířov	METRANS, a.s.
Siding network OKD, Doprava, a.s. - siding Báňská (direction VST Prostřední Suchá)	Havířov	PKP International, a.s.

7.8.2. Poland

In 2016, there were major changes in the operation of the railways. By the Act of 25 September 2015. on the amendment of the Act on rail transport, new obligations regarding rail safety were introduced, including rail sidings.

The expected act on the next amendment to the Rail Transport Act, called the "major amendment", has had considerable consequences for almost all participants of the rail market. New definitions were introduced, new location of railway sidings, a new category of entities was created - service infrastructure managers, new tasks of the President of the

Office of Rail Transport, infrastructure sharing rules and other provisions.
In general, the concepts of 'train traffic', 'accessibility' and 'private infrastructure' are key to distinguishing basic solutions. To put it simply, if there is train movement on a given infrastructure (entry, exit or passage of a train in accordance with the decision of the infrastructure manager), then the condition of its functioning is that the administrator has the safety authorization issued by the President of UTK. If the infrastructure is "private" or only maneuvers are carried out on it, its manager is obliged to have another type of certification document, ie a security certificate, also issued by the President of UTK.
siding users and the freight structure of rail transport. The coal transport dominating in the freight structure of rail transport (at the level of 40%) is not reflected in the number of siding users from the energy sector. The energy sector needs frequent supplies of significant amounts of coal transported mainly by rail. That is why the energy sector sidings are quite intensively used. The mineral and construction sector, which had the most sidings, was responsible for around 20% of transport. The transport of crude oil and its products and gas, related to the fuel sector, as well as the transport of metal ores and metal products - to the metallurgy sector also had a share above 10%. Over 10% of sidings belonged to the agri-food sector, which accounted for only about 3% share in the freight structure of rail transport. It was caused by a significant decrease in the transport of this group of goods and a shift of transport to roads at the turn of the 20th and 21st century. However, these plants have preserved railway infrastructure, which is used to a small extent. The significant share of the machinery sector among siding users can be partly explained by the operation of rolling stock facilities. The share of machinery and equipment transport in the rail freight structure did not exceed 1%. The chemical sector, with over 6% of sidings, was responsible for around 4.5% of rail transport. In 2012, intermodal transport (mainly containers) accounted for less than 4% in the freight structure of rail transport, and container terminals used over 2% of railway sidings. However, it should be emphasized that this was a segment that was developing dynamically.
The tasks of the entity responsible for comprehensive service of the railway siding often include, in addition to its maintenance and running train traffic on it, also performing transport outside the siding, including as part of the delivery of raw materials or the export of post-production waste (so-called niche transport). Therefore, they are required to have a railway carrier's license and safety certificate. The leaders in this area since 2010 were: the PKP Cargo Logistics group (including: Cargotor Sp. Z oo - 38 sidings and PKP Cargo Service Sp. Z oo - 37 sidings), the CTL Logistics group (including: CTL Maczki-Bór and in.), DB Schenker Rail Polska and Cement SA (servicing seven sidings of plants in the cement and lime industry).
A large number of railway sidings in Śląskie and Opolskie voivodships are currently out of service, however there is a potential to restore operational parameters. An additional problem is the numerous changes of land owners in the results of sales or privatization, especially in terms of sidings, which were located in large industrial plants (steel mills, mines, etc.). Some of the sidings still have the character of track sidings, e.g. Kędzierzyn Azoty. In some cases, such as in the Krapkowice Otmęt siding, additional tracks were demolished and the buildings were adapted for other purposes. There are also sidings, for example Opole Groszowice - sidings, in the immediate vicinity of the junction stations Opole Groszowice and Opole Grotowice, shared by Elektownia / Kamionka Groszowice, Limestone Quarry and HFG Polska (Metalchem).
The location map of service points in freight traffic is presented below.

Table 92 - A tabular list of sidings in the Śląskie and Opolskie voivodships is presented below:

Siding - search results in stations:	
Silesian voivodeship	**Opole vivodeship**
Będzin Łagisza (voivodship śląskie)	Gałązczyce (voivodship opolskie)
Bielsko-Biała Leszczyny (voivodship śląskie)	Goświnowice (voivodship opolskie)
Bielsko-Biała Lipnik (voivodship śląskie)	Kluczbork (voivodship opolskie)
Blachownia (voivodship śląskie)	Krapkowice (voivodship opolskie)
Boronów (voivodship śląskie)	Krapkowice Otmęt (voivodship opolskie)
Chełm Śląski (voivodship śląskie)	Lewin Brzeski (voivodship opolskie)
Chudów (voivodship śląskie)	Lipki (voivodship opolskie)
Cieszyn Marklowice (voivodship śląskie)	Lubrza (voivodship opolskie)
Częstochowa Gnaszyn voivodship śląskie)	Mańczok (voivodship opolskie)
Częstochowa Mirów (voivodship śląskie)	Polska Nowa Wieś (voivodship opolskie)
Dąbrowa Górnicza Piekło (voivodship śląskie)	Radzikowice (voivodship opolskie)
Dąbrowa Miejska (voivodship śląskie)	Staniszcze Wielkie (voivodship opolskie)
Huta Cedler (voivodship śląskie)	Szydłów (voivodship opolskie)
Imielin (voivodship śląskie)	Szymiszów (voivodship opolskie)
Jastrzębie Zdrój Zofiówka (voivodship śląskie)	Tułowice (voivodship opolskie)
Jaworzno (voivodship śląskie)	Zakłady Azotowe Kędzierzyn (voivodship opolskie)
Juliusz (voivodship śląskie)	Bielsko-Biała Wschód (voivodship śląskie) subobject: Bocznica Teksid
Katowice (voivodship śląskie)	Bytom Bobrek (voivodship śląskie) subobject: Bocznica EC Szombierki [Kraftwerk Oberschlesien]
Kleofas (voivodship śląskie)	Herby Stare (voivodship śląskie) subobject: Bocznica placu drzewnego.
Kochcice (voivodship śląskie)	Łagiewniki Dzierżoniowskie (voivodship dolnośląskie) subobject: Bocznica "Cukrowni Łagiewniki"
Kopalnia Mysłowice Szyb Wsch. (voivodship śląskie)	Mierzęcice Zawierciańskie (voivodship śląskie) subobject: Bocznica składnicy złomu.
Koszęcin (voivodship śląskie)	Nakło Śląskie (voivodship śląskie) subobject: Prażalnia Nakło Śląskie
Krupski Młyn (voivodship śląskie)	Radoszowice Wschód (voivodship opolskie) subobject: Bocznica do kopalni bazaltu
KWK Andaluzja (voivodship śląskie)	Suszka kopalnia (voivodship dolnośląskie) podobiekt: Bocznica
KWK Bobrek - Ruch Centrum (voivodship śląskie)	Gałązczyce (voivodship opolskie)
KWK Katowice (voivodship śląskie)	Goświnowice (voivodship opolskie)
KWK Niwka-Modrzejów Boczn. (voivodship śląskie)	Kluczbork (voivodship opolskie)
KWK Niwka-Modrzejów Szyb Kazimierz III (voivodship śląskie)	Krapkowice (voivodship opolskie)
KWK Piast (voivodship śląskie)	Krapkowice Otmęt (voivodship opolskie)
KWK Wieczorek Szyb Poniatowski (voivodship śląskie)	Lewin Brzeski (voivodship opolskie)
KWK Wujek (voivodship śląskie)	Lipki (voivodship opolskie)
Lisów (voivodship śląskie)	Lubrza (voivodship opolskie)
Pawonków (voivodship śląskie)	Mańczok (voivodship opolskie)
Pilchowice - Bierawka (voivodship śląskie)	Polska Nowa Wieś (voivodship opolskie)
Psary Grodków (voivodship śląskie)	Radzikowice (voivodship opolskie)
Racibórz Dębicz (voivodship śląskie)	Staniszcze Wielkie (voivodship opolskie)
Racibórz Płonia (voivodship śląskie)	Szydłów (voivodship opolskie)
Ruda Czarny Las (voivodship śląskie)	Szymiszów (voivodship opolskie)
Ruda Śląska Nowy Bytom (voivodship śląskie)	Tułowice (voivodship opolskie)
Rybnik Niedobczyce (voivodship śląskie)	Zakłady Azotowe Kędzierzyn (voivodship opolskie)
Rycerka Bocznica (voivodship śląskie)	Bielsko-Biała Wschód (voivodship śląskie) subobject: Bocznica Teksid

Staszic (voivodship śląskie)	Bytom Bobrek (voivodship śląskie) subobject: Bocznica EC Szombierki [Kraftwerk Oberschlesien]
Strzybnica Wąskotorowa (voivodship śląskie)	Herby Stare (voivodship śląskie) subobject: bocznica placu drzewnego.
Szyb Wschodni-Agata (voivodship śląskie)	Łagiewniki Dzierżoniowskie (voivodship dolnośląskie) subobject: Bocznica "Cukrowni Łagiewniki"
Tworóg (voivodship śląskie)	Mierzęcice Zawierciańskie (woj. śląskie) subobject: Bocznica składnicy złomu.
WNTK Smolnica (voivodship śląskie)	Nakło Śląskie (voivodship śląskie) subobject: Prażalnia Nakło Śląskie
Wodzisław Śląski (voivodship śląskie)	Radoszowice Wschód (voivodship opolskie) subobject: Bocznica do kopalni bazaltu
Wojciech (voivodship śląskie)	Suszka kopalnia (voivodship dolnośląskie) subobject: Bocznica
Zabrze (voivodship śląskie)	
Zabrze Mikulczyce (voivodship śląskie)	
Zakład Górniczy bocznica Kwarc (voivodship śląskie)	
Żywiec Sporysz (voivodship śląskie)	
Bielsko-Biała Wschód (voivodship śląskie) subobject: Bocznica Teksid	
Bytom Bobrek (voivodship śląskie) subobject: Bocznica EC Szombierki [Kraftwerk Oberschlesien]	
Herby Stare (voivodship śląskie) subobject: bocznica placu drzewnego.	
Łagiewniki Dzierżoniowskie (voivodship dolnośląskie) subobject: Bocznica "Cukrowni Łagiewniki"	
Mierzęcice Zawierciańskie (voivodship śląskie) subobject: Bocznica składnicy złomu.	
Nakło Śląskie (voivodship śląskie) subobject: Prażalnia Nakło Śląskie	
Radoszowice Wschód (voivodship opolskie) subobject: Bocznica do kopalni bazaltu	
Suszka kopalnia (voivodship dolnośląskie) subobject: Bocznica	

Siding - search results in lines:	
Silesian voivodeship	**Opole vivodeship**
Bielsko-Biała Główna – Cieszyn (– Český Těšín) (190/480)	Baborów – Pilszcz – Opava (325)
Siding to sugarworks Strzelin	Barnówko – bocznice
Bytom Północny – siding to the dolomite quarry	Białystok – Głomno (– Багратионовск) (38)
Dąbrowa Górnicza Strzemieszyce – Sosnowiec Zagórze (184)	Bielawa Zachodnia Dworzec Mały – Radków (318/327)
DG Piekło – siding	Bielsko-Biała Główna – Cieszyn (– Český Těšín) (190/480)
Drwęczno – siding	Siding to sugarworks Strzelin
Gryfbet – siding	Siding to gasworks
Kobierzyce – beetroot queue	Bodaczów – siding
Lasowice – Strzybnica Wąskotorowa subobject: Kamieniołom	Brzeg – Łagiewniki Dzierżoniowskie (304)
Opole Groszowice – siding subobject: Bocznica „Metalchemu”	Brzeszcze Kopalnia – siding
Pustków Żurawski – beetroot queue	Bydgoszcz Wąskotorowa – Koronowo Wąskotorowe

Siemianowice piask – bocznica	Bytom – Wrocław Główny (132)
Sosnowiec Główny R3 – Sosnowiec Pogoń (185)	Bytom Północny – siding to the dolomite quarry
Szczakowa Północ – Zakład Górniczy bocznica Kwarc (kp 206)	Czerwony Bór – Zambrów (50)
Tunel – Sosnowiec Główny (62)	Dąbrowa Górnicza Strzemieszyce – Sosnowiec Zagórze (184)
Wąpielsk bocznica	Dębica Wschodnia – Dębica Towarowa
Wodzisław Śląski – KWK 1 Maja (875)	DG Piekło – siding
Wyczerpy – bocznica	Drwęczno – siding
Zabrze – bocznice	Głęboki Bród
Zabrze Południowe – EC Zabrze (silosy)	Głowno – siding
Żyglin – Huta Cynku Miasteczko Śląskie	Gogolin – Prudnik (306)

7.8.3. Slovakia

A relatively large number of sidings are operated within the region. Most sidings were set up before 1989, when rail transport was used to a much greater extent than it is now, due to the underdevelopment of the motorway network in the north of Slovakia and the preference for rail transport.

Table 93 - List of sidings operated in the Žilina self-governing region

Connection	Operator	Primary use
Bytča	TSR Slovakia, s.r.o.	Waste management
Bytča	Štefan Kypús - Obchod s palivom	Fuel
Bytčica	FERONA Slovakia a.s.	Metallurgical products
Dolný Hričov	VÁHOSTAV-SK-Prefa s.r.o.	Precasts
Dolný Hričov	Zberné suroviny, a.s.	Waste management
Kráľova Lehota	EUROVIA - Kameňolomy s.r.o.	Stone transport
Kysucké Nové Mesto	KLF-ENERGETIKA a.s.	General loading and unloading track
Lietavská Lúčka	Cementáreň Lietavská Lúčka a.s.	Cement and associated products
Lietavská Lúčka - Porúbka	Lesy SR, š.p.	Woodo
Liptovská Teplá	LIBEGRIN, s.r.o.	General loading and unloading track
Ľubochňa	Lesy SR, š.p.	Wood
Martin	FERONA Slovakia a.s.	Metallurgical products
Medzibrodie nad Oravou	Ekofin consult, a.s.	General loading and unloading track
Oravský Podzámok	Amico Drevo s.r.o.	Wood
Oravský Podzámok	STAVIVÁ - Garaj s.r.o.	Building materials
Párnica	OFZ a.s.	Feritic products
Príbovce	Lesy Slovenskej rep., š. p.	Wood
Príbovce	PROFIL RAKOVO	Engineering production
Ružomberok	Doprastav, a.s.	Building materials
Ružomberok	Milan Kuchár - DRUSUR	Waste management
Ružomberok	Lesy SR š.p.	Wood
Ružomberok - Lisková	Mondi SCP, a.s.	Paper industry

Turany	PEGASS SK, spol. s r.o.	General loading and unloading track
Tvrdošín	ORAVSKÉ VÝROBNÉ DRUŽSTVO	Food industry
Varín	Dolvap, s.r.o.	Limestone products
Varín	Žilina Invest,s.r.o.	General loading and unloading track
Vrútky - Dopravňa Vlečka ŽOS Vrútky a.s.	ŽOS Vrútky a.s.	Railway cars
Vrútky	Compel Rail a.s.	Engineering production
Vrútky	Lahita trade, s.r.o.	Engineering production
Vrútky	Stredoslovenská energ., a.s.	Fuels
Vrútky	Neografia, a.s.	Printing products
Vrútky	Probugas a.s.	Gas
Vrútky	VOLKSWAGEN SLOVAKIA, a.s.	Automotive
Vrútky	ZDROJ MT, s.r.o.	General loading and unloading track
Vrútky	Lesy SR, š.p.	Wood
Vrútky nákl. st.	Prefa Sučany a.s.	Precasts
Žilina	Mätsa Tissue Slovakia, s.r.o.	Paper industry
Žilina	Žilinská teplárenská a.s.	Coal
Žilina - Teplička nad Váhom	Kia Motors Slovakia, s.r.o.	Automotive
Žilina - Teplička nad Váhom	TIP Žilina, s.r.o.	Intermodal transport
Žilina zriaď. st.	Rail Cargo Operator - ČSKD INTRANS, s.r.o.	Intermodal transport

Most sidings are located in major industrial centers where major companies are located that use rail transport to a large extent. Due to the siding performance, there is enough room for everyone to improve performance. Selected connections to the other rail network may be problematic, such as connecting a Kia siding to the main track by means of a manually adjusted turnout, where this solution has a high time requirement for operation, since there must be a manual adjustment and securing the turnout when passing. Due to the fact that almost all sidings were built under socialism, the technological elements used will mostly show obsolescence, with the exception of sidings terminated in the already modernized infrastructure, where all sidings are also modernized.
At present, the new sidings are going to be invested or supported as new industrial parks. The construction of new sidings is not supported directly from the state budget, as there is no plan to support the switchover to rail transport and individual large enterprises may request funding for railway termination if this is one of the financial incentives for the construction of a new plant.

7.9. Removing bottlenecks on routes to transhipment sites

7.9.1. Czech republic

The largest increase in the volume of transport in the MSK region is recorded by container trains that carry containers from sea. the ports of Hamburg, Bremen, Rotterdam to the interior of Europe (until the deadline in Šenov), from the terminal in Paskov to Germany

(the Herne terminal) or via the port of Mělník to Germany, the port of Trieste in Italy, Koper in Slovenia, Russia Poland.
The siding and the terminal in Paskov are connected to the railway station. Vratimov (on line 302A). The main problem in relation to the siding and the terminal in Paskov are the bottlenecks - limiting sections in terms of permeability, namely the section Vratimov - Paskov and Paskov - Lískovec near F.M. This is due to the high number of Mn trains serving these stations, which take the load from sidings to railway stations. Ostrava-Kunčice caused, inter alia, the missing electrification in the section Ostrava-Kunčice - Frýdek-Místek - (Valašské Meziříčí) and also the missing second line. track in the section Vratimov - Frýdek-Místek - (Valašské Meziříčí).
Due to the not yet electrified track tracks, direct load travel is not possible. trains (terminating or starting on / from AWT siding) to the railway station. Vratimov and trains must switch electric locomotives to independent traction locomotives in the railway station. Ostrava-Kunčice. AWT, as also plans to electrify the siding itself from its own funds so that trains can run directly from track to siding without having to locate locomotives.

On this line also trains transporting finished cars (on special cars) from Hyundai to Europe, from railway station. Frýdek-Místek (Hyundai siding is connected to the Dobrá railway station at F.M. on the non-electrified line 302B Český Těšín – Frýdek-Místek). These trains also have to interconnect locomotives in the railway station. Ostrava-Kunčice.

In the future, electrification of the Ostrava-Kunčice - Frýdek-Místek section on line 302A is planned to reduce its load. After electrification, the number of Mn trains in the Ostrava-Kunčice-Frýdek-Místek section will decrease and AWT trains will run directly on the siding and trains with cars up to the railway station. Czech firm.

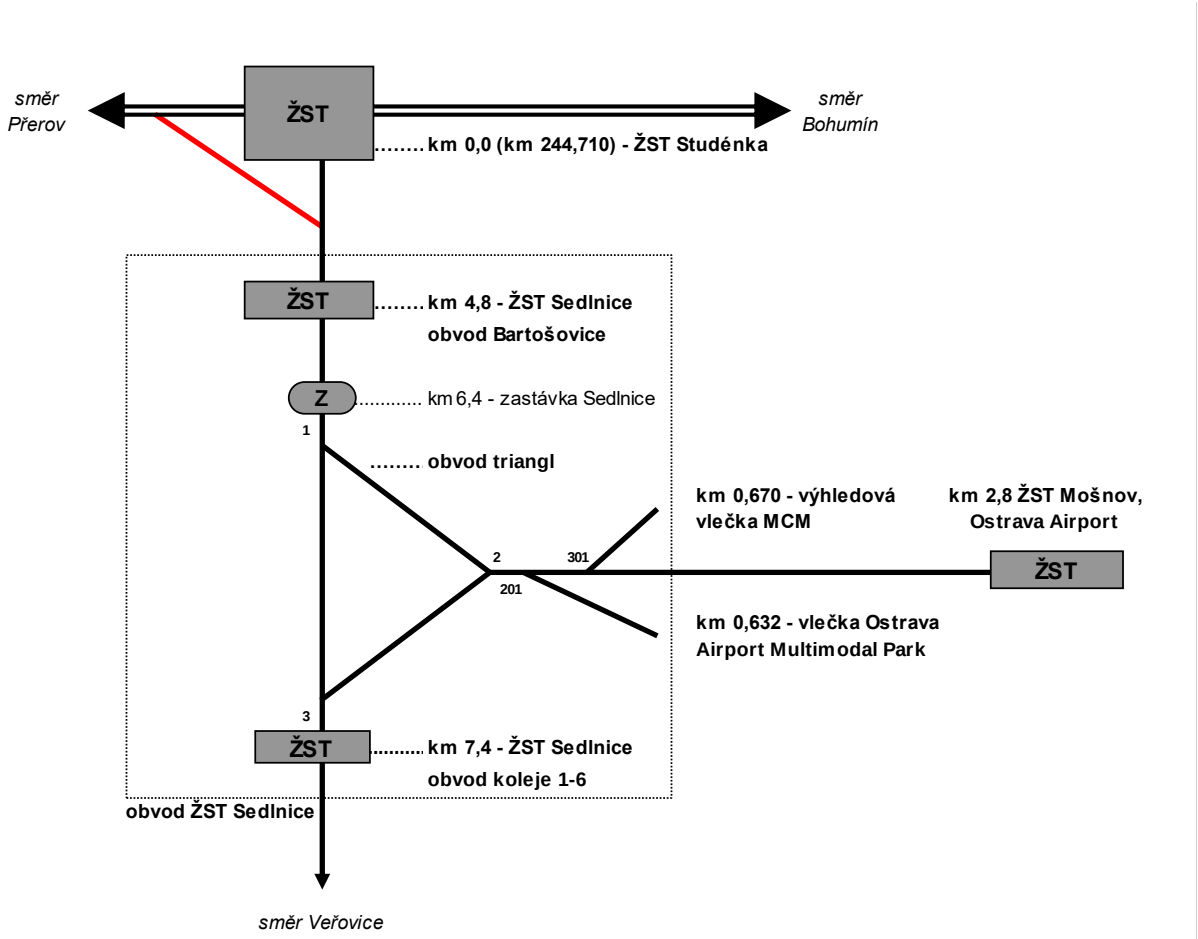
Only 2 pairs of Nex trains run to the **KD terminal in Šenov (near Havířov)**. Railway station. Havířov is situated on the line 301D Český Těšín - Point Polanka. In the section Havířov-Ostrava-Kunčice there is a higher coefficient of utilization of throughput, but still there is a sufficient reserve in the throughput and the number of free routes. Thus, the terminal can be operated without problems. The only limitation is that the siding runs across the level crossing in the outskirts of Havířov. In terms of road transport, there is good transport links to road II / 479 and further to I / 11 Rudná to Ostrava.

The OAMP **siding and terminal in Mošnov** will be built in the future, which should be public on the 306A line in the section Studénka - Sedlnice - Bartošovice. - Mosnov Airport is a sufficient reserve in throughput.
A territorial-technical study Increasing the infrastructure capacity of SŽDC was carried out in connection with the construction and development of the Mošnov container terminal. For the outlook - after the commissioning of the OAMP siding and the KD terminal and MCM siding, an assessment of the infrastructure capacity was carried out. The limiting elements for the prospective scope of transport for the needs of the Mošnov terminal are:
Studénka railway station on the SŽDC network - has a single track for freight trains running in the direction of the OAMP siding (the other must remain free for passenger transport). The capacity limit is a total of 20 trains per 24 hours (5 + 5 trains from the north and 5 + 5 trains from the south).
railway station. Sedlnice, district Bartošovice and railway station. Sedlnice, perimeter Sedlnice - insufficient number of tracks, not trimming tracks.
Single-track section Studénka - Sedlnice on the SŽDC network
missing clutch from railway station Studénka on line 306A for the possibility of direct journeys to this line to Sedlnice and further to the siding and terminal in Mošnov

Currently we can only start from the existing transport station in the section Studénka - switches no. 201, by which the terminal and the siding OAMP) will be connected to the railway network of SŽDC.
In terms of technology of operation, however, it is necessary to build a clutch in the railway station. Studénka, which allows direct trains to Mošnov, without the need to hang and drive around the traction vehicle (see chapter 7.7.1).

The following stages are recommended:
Stage 1 - construction of a new inverter-free clutch Přerov - Sedlnice and capacity increase of railway station. Sedlnice, district Bartošovice) in the total amount of investment costs 591.044 mil. Ft.
The new connection of the Studénka-Sedlnice-Mošnov and Bohumin-Přerov lines (in the form of the station track No. 90 in the circumference of the Studénka railway station) will enable to increase the railway capacity. Studénka a will ensure a fast and seamless transport of freight trains in the direction of the siding OAMP and MCM and the transit railway corridor in the direction of Přerov.
There is an increase in the number of tracks in the railway station. Sedlnice, the district of Bartošovice, by 1 transport track no.104 in the length of 709 m and 2 pieces of tracks that will be electrified. The new track will serve as an overdose for the transfer of load on the MCM siding. Modifications will be made from km 4,366 (stop of single track no. 102a) to km 5,375 (stop of single track no. 102b) of the section between the railway station. Studénka - railway station Sedlnice, which is a part of line 306A Studénka - Veřovice. The length of the section is 1000 m. The proposed track modifications allow a maximum speed of 50 km / h throughout the section
Stage 2 - capacity increase of railway station. Sedlnice, district Sedlnice in the scope of investment costs 288,875 mil. Ft. Adjustments within Variance # 4 it is recommended to coordinate and, where appropriate, implement it in conjunction with modifications to the infrastructure defined in the Beskydy study.
There is an increase in the number of rails in the railway station. Pair of rails, track circumference 1-6, about 1 transport track and 2 piece rails, which will be electrified. The Příborské head will be moved southwards in order to extend the existing tracks to a length of at least 650 meters. The OAMP, MCM and Čepro siding will be operated by complete min. 610 meters. The opening of the Čepro siding is also modified. All transport tracks are designed as electrified.
Total investment costs for both stages amount to 879,919 mil. CZK.

Figure 42 – Scheme of planned mismatch connection to Mošnov



7.9.2. Poland

Also in Poland, in terms of transport volumes, the most common is the combined transport, ie container transport. For this reason, a good connection of the KD terminals to the main railway lines is necessary, which is achieved within the TRITIA region and the PKP PLK network. KD terminals are mostly connected to double-track electrified lines.
PCC Intermodal S.A. Gliwice Port
It is connected to Gliwice Port near the port on a double-track electrified line 167 Szobiszowice - Gliwice Port 1.75 km long and a single-track electrified 675 Szobiszowice - Gliwice Port length 0.848 km.
These lines are followed by line 137 Katowice - Legnica, which is double-track electrified (up to Kędzierzyn Koźle), in the section Kędzierzyn Koźle -
Nowa Wieś Legnicka (in front of Legnica) unelectrified and further from Kamieniec Ząbkowicki monorail (and then alternates two-track short section with monorail). The section Świdnica Miasto - Jaworzyna Ślanska line 137 was included in the list of reserve projects within the co-financing from the RPO of the Lower Silesian Voivodeship. However, other sections are not. Furthermore, this line would be linked to line 141 Katowice Ligota - Gliwice.

Container terminal PKP Cargo Connect (Gliwice Sośnica)
is connected to the Gliwice Sośnica railway on the line 141 Katowice Ligota - Gliwice, double-track electrified on Gliwice Sośnica, the end section is monorail. The total length is 25,564 km. The track is in very bad condition, there are sections that are in undermined territory. Max. speed of 80 km / h is reached in total to about 1/3 of the length of the track (sinks from 80 km / h to 50, 60 and further to 40 and 30 km / h (in total 3.7 km the speed is 30 km / h) This line is followed by line 137 Katowice - Legnica, which is double-track electrified (up to Kędzierzyn Koźle) and then single-track electrified.

Container terminal Slawków
is connected to an industrial site near Dąbrowa Górnicza Wschodnia on the double-track electrified line 171 Dąbrowa Górnicza Towarowa - Panewnik and Jaworzno Szcakowa on the double-track electrified lines 133 Dąbrowa Gókowice Śląsków - Kraków 134 line 1 Warszawa Zachodnia - Katowice. Also connection to line 62 Tunnel - Sosnowiec Główny. Metrans Terminal, Polonia Sp. z.o.o. is connected to the lines in the industrial area near the Dąbrowa Górnicza smelter. It is well connected to the 133 Dąbrowa Górnicza Ząbkowice - Kraków Główny and 134 Jaworzno Szczakowa - Mysłowice two-track lines and further to line 1 Warszawa Zachodnia - Katowice. Furthermore, the connection to the next line 62 Tunnel - Sosnowiec Główny.

Container terminal Włosenica (near Katowice)
It is connected to the double-track electrified line 94 Kraków Płaszów - Oświęcim (direction Kraków) - 64,297 km long, which is not in good technical condition. The maximum speed is 80 km / h, there are frequent drops from 80 to 60 or 40 km / h. At most of its length (34 km in total) the speed is 60 km / h, in the length of 4 km the speed is 60 km / h, in the length of 8 km the speed is 40 km / h.
It is also connected to the double-track electrified line 93 Trzebinia - Zebrzydowice (runs through Oświęcim, Czechowice-Dziedzice), the maximum speed of 120 km / h (in total - approx. This track is not in good technical condition - most of the track length is alternated with drops of 30, 40, 50, 60, 70 and 80 km / h. Totally low speeds - in the length of 16 km in the track No.1 and in the track No.2 in the length of 20 km the speed is 30 km / h,
This line is included in the list of constructions in the CPK concept, implementation is expected until 2023.
On January 11, 2019 a contract was concluded with the construction company Budimex Budownictwo sp. z o.o. for project implementation 2016-PL-TMC-0105-W: Work on basic routes for passenger transport (E 30 and E 65) in the Silesia region, 1st stage - section Będzin - Katowice - Tychy - Czechowice-Dziedzice - Zebrzydowice, LOT C Wisła Bridge - Czechowice Dziedzice - Zabrzeg. For freight trains as part of the reconstruction of this section, the tracks in the stations will be extended to 740 m and the speed of freight trains will be increased to 120 km / h.
Line 138 Oświęcim - Katowice is a double-track, electrified track with a length of 32,970 km. Max. the speed of 100 km / h is totally achieved at a length of 11 km (to 1/3). This track is not in good condition, there are frequent speed drops and restrictions to 40.50, 60 km / h.

Forward terminal in Rybnik
PKP S.A. envisages the construction of the terminal together with warehouse and logistics infrastructures on an area of 20 ha of land located near Rybnik Towarowy Station.

Development plans concern PKP S.A. to Kadłubka Street, which used to be a group of departure tracks. This area is close to two important railway junctions - Chwałowice and Wodzisław. The investment costs can reach PLN 80 million and the construction of the intermodal terminal will take 2 years.
158 Rybnik Towarowy - Chałupki is an electrified track 25.035 km long, with a length of 7.828 km it is double-tracked, then it is single-track to Chałupka. The maximum speed is 80 km / h (only in the direction to Chalupek), otherwise in the opposite direction usually 60 km / h.
Furthermore, the possibility of connection to two-track electrified lines 173 Rybnik - Sumina, 149 Zabrze Makoszowy - Leszczyny, 159 Orzesze - Wodzisław Śląski (which is double-track and electrif. Only in a short section).

7.9.3. Slovakia

Both terminals on the territory of ŽSK are connected to the TEN-T core network in the Žilina node and their connection is currently sufficient to cover their outputs. In the case of the Žilina terminal, the internal conditions are unsatisfactory, when both reloading tracks do not reach the required length, but this fact cannot be modified due to local conditions. The terminal in Teplička was built with regard to modern requirements for new terminals and in the long term it should provide sufficient capacity for the growth of transport performance.
At present no additional direct investment in the construction of terminals in the territory of ŽSK is envisaged, as relevant information regarding the impact of the introduction of TIP Žilina into operation is not yet available.

7.10. Key routes and basic nodes specifying

7.10.1. Czech republic

Direction Czech republic - Poland
Corridor lines 301A, 305B, 301D and lines leading to the Polish border 305A and 305 C to cross-border station Chalupki and 301B and 301C to cross-border station Petrovice u Karviné remain key routes for the MSK region. In addition, there are lines loaded with traffic in relation to the container terminal in Paskov and Hyundai siding, namely lines 301G and 302A and in the future lines for connecting the KD terminal in Mošnov - lines 306A and 305H.
The nodal points are both border stations in the direction of Poland (Petrovice u Karviné and Chałupki) and also places where the transhipment of goods from the railway to the road will be concentrated. places with container terminals (Paskov, Šenov u Havířova, prospectively Mošnov). In connection with the collection and distribution of consignments from and to container terminals it is necessary to increase the capacity of road connections and to build new roads and bypasses of cities.
Main constraints on the competitiveness of international rail transport between the Czech Republic and Poland (on the RFC 5 corridor) preventing the transfer of part of the volume of goods from road to rail:

- In border crossing stations between SŽDC and PKP PLK network is bad cooperation between PKP PLK and SŽDC in freight trains crossing the state border

- Telematics - non-harmonized IS - lack of timely transmission of train information arriving from PKP PLK to SŽDC (their preliminary arrivals to PPS, train composition, etc.), requests for ad hoc routes on the Polish side have long deadlines; non-harmonized timetables of trains of one carrier (from Poland and the Czech Republic), which arrive in PPS - for the possibility of changing and changing locomotives
- technology in cross-border station - very long stays of freight trains in PPS while waiting for locomotive shunts, waiting for shunting (when it is necessary to eliminate management wagons), for technical train inspections, waiting for departure
  Carriers are not compelled by any regulations (eg under the threat of certain sanctions) to shorten train stays in cross-border station, ie. Improve PPS process technology. There is no specific optimal time required for these processes. For example, there are no fees for train stays on the SŽ network, etc.
- cross-border station infrastructure on the SŽ network (Petrovice u Karviné and Bohumín-Vrbice) - ensure a sufficient number of tracks, including railing, elimination of speed gaps on the head
- Insufficient permeability of railway sections on the main freight corridors on the SŽDC network - long running times of freight trains (frequent stopping for operational reasons - priority of passenger trains, transport, lockout)
  absence of detour routes to main freight corridors (lines 305B and 301A)
- insufficiently equipped infrastructure track. the sections on which there are stations, from which sidings to container terminals:
  a) eg line 302A - lack of double-track and electrification of the section Ostrava Kunčice - Frýdek-Místek,
  b) missing mismatch connection between line 305B and 306H at the Studénka railway station - for the future KD terminal in Mošnov

The border station Petrovice u K. is the main element limiting the throughput. Due to the long-term freight train stays in this TSO, a “freight train queue” is being created on the main corridor (line 305B), waiting for example at the stations Polanka n.O., Ostrava-Svinov, Ostrava hl.n., Bohumín and Dětmarovice to clear the tracks in Petrovice. It is confirmed by inquiries from carriers and a visit to the Traffic Control Center in Přerov that during the day freight transport is more or less stopped and only at night freight trains start moving (because there are no passenger trains).
In addition, the reconstruction of the Petrovice u K. railway station is being prepared in 2021 and railway carriers will probably have to use other routes for transit to Poland. Probably trains from the Czech Republic to Poland with routes in the annual timetable (with stays of max. 30 min) will run through the PPS Bohumín-Chałupki, where it will be possible to check in including the train replacement. chat.
Trains with ad hoc routes will run through PPS Český Těšín / Czieszyn. Trains from Poland to Slovakia and terminating at the Ostrava-Kunčice railway station will also be directed via the Český Těšín PPS.
Due to the extensive closures on line 305 B Bohumin - Prerov in 2020, some would rather choose routes across Slovakia in the south direction.

Direction Czech republic - Slovakia
Because it is historically one country (1918 - 1993), which was later divided, so there are no such barriers and international freight trains from Slovakia to the Czech Republic run relatively smoothly.

Trains from Slovakia usually end in the Ostrava region and do not continue on the SŽDC network.
The prevailing international transit freight transport through the territory of TRITIA by rail is directed in the direction north - south (CR - Poland) and further north to Belarus, Russia, Sweden, Finland or south to Austria, Italy and Slovenia.
International transit freight transport in the west - east direction (CR - Slovakia) concerns only transports between the Czech Republic and Slovakia - supplying raw materials in the Ostrava region and exports of coal and metallurgical products to Slovakia. In addition, there is a connection to the northwest via Germany to the ports of Hamburg and the Netherlands to the port of Rotterdam. The continuation of transit eastwards (to Ukraine) was interrupted by the war - an embargo was declared.

7.10.2. Poland

In the TRITIA region, the Baltic-Adriatic Rail Freight Corridor 5 (RFC5) is the rail transport of the most popular rails.
Baltic – Adriatic Rail Freight Corridor 5, north-south axis, connects ports in Poland, Slovenia and Italy with main land terminals of all countries among the corridor. The initial routing defined in Annex 913/2010 was: “Gdynia - Katowice - Ostrava / Zilina - Bratislava / Vienna / Klagenfurt - Udine - Venice / Trieste / Bologna / Ravenna / Graz - Maribor - Ljubljana - Koper / Trieste” , and it was one of the 9 initial Rail Freight Corridors included in the Regulation.
The second track of the RFC8 track - the towing track No. 8 Morze Północne - Morze Bałtyckie - wschód - zachód.

Figure 43 – Scheme of corridors RFC5 and RFC8

In 2017, satisfaction surveys of users of freight corridors 5 and 8 were carried out. In the case of corridor 5, 13 entities took part in the survey - in relation to the Polish part of the corridor, the respondents indicated the unsatisfactory quality of the railway infrastructure in Poland, which causes transit uncompetitive, travel times are longer and access costs are high. In the case of corridor 8, users had reservations about the conditions for canceling routes in Poland, which constitute a barrier to ordering capacity.

Figure 44 - Map of investments included in the National Railway Program In the ilesian Voivodeship:

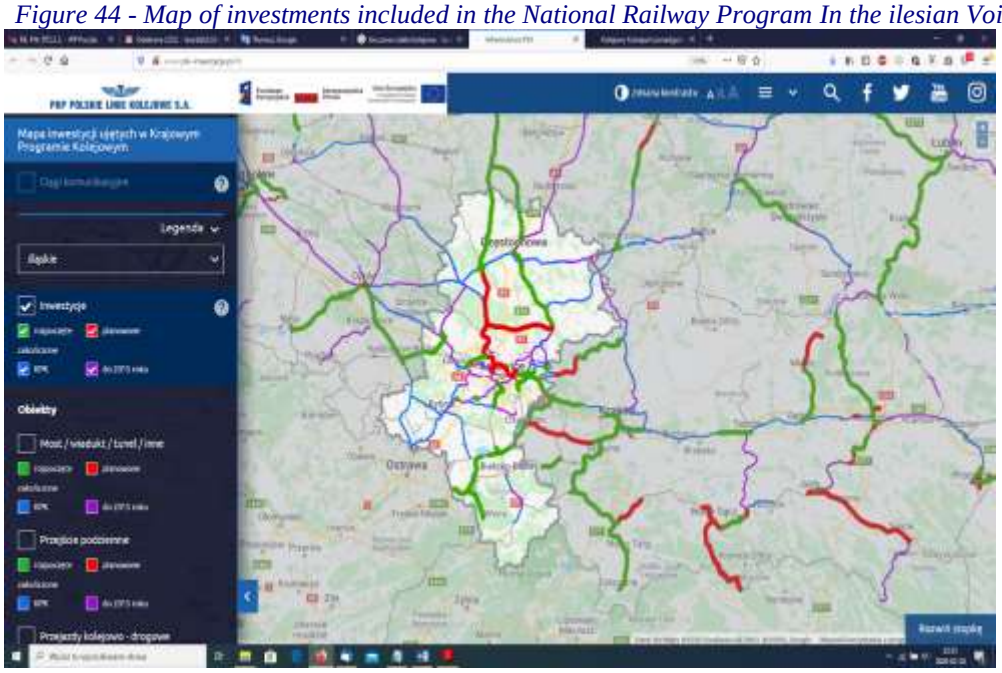
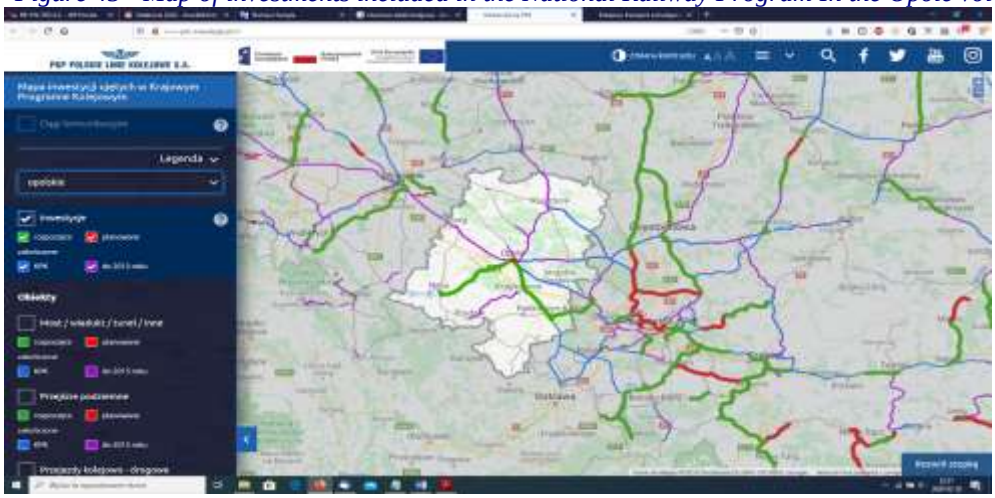


Figure 45 - Map of investments included in the National Railway Program In the Opole voivodeship



A factor impeding the implementation of freight is problems with the point infrastructure capacity. This is particularly important in areas that are sources of heavy traffic: border, port and in the region of Upper Silesia. Below, there are problems with point infrastructure capacity that are not related to ongoing modernization works.

<u>Border crossings and border stations:</u>

- Braniewo: a small number of standard and broad gauge parking tracks cause congestion at the Braniewo station and delays for trains crossing the border;
- Chałupki: many carriers signal a common problem of busy tracks, which means that entry to the station is delayed;
- Małaszewicze Centralne: carriers signaled permanent problems with entering the station and displaying warehouses from the container terminal for CARGOTOR infrastructure;

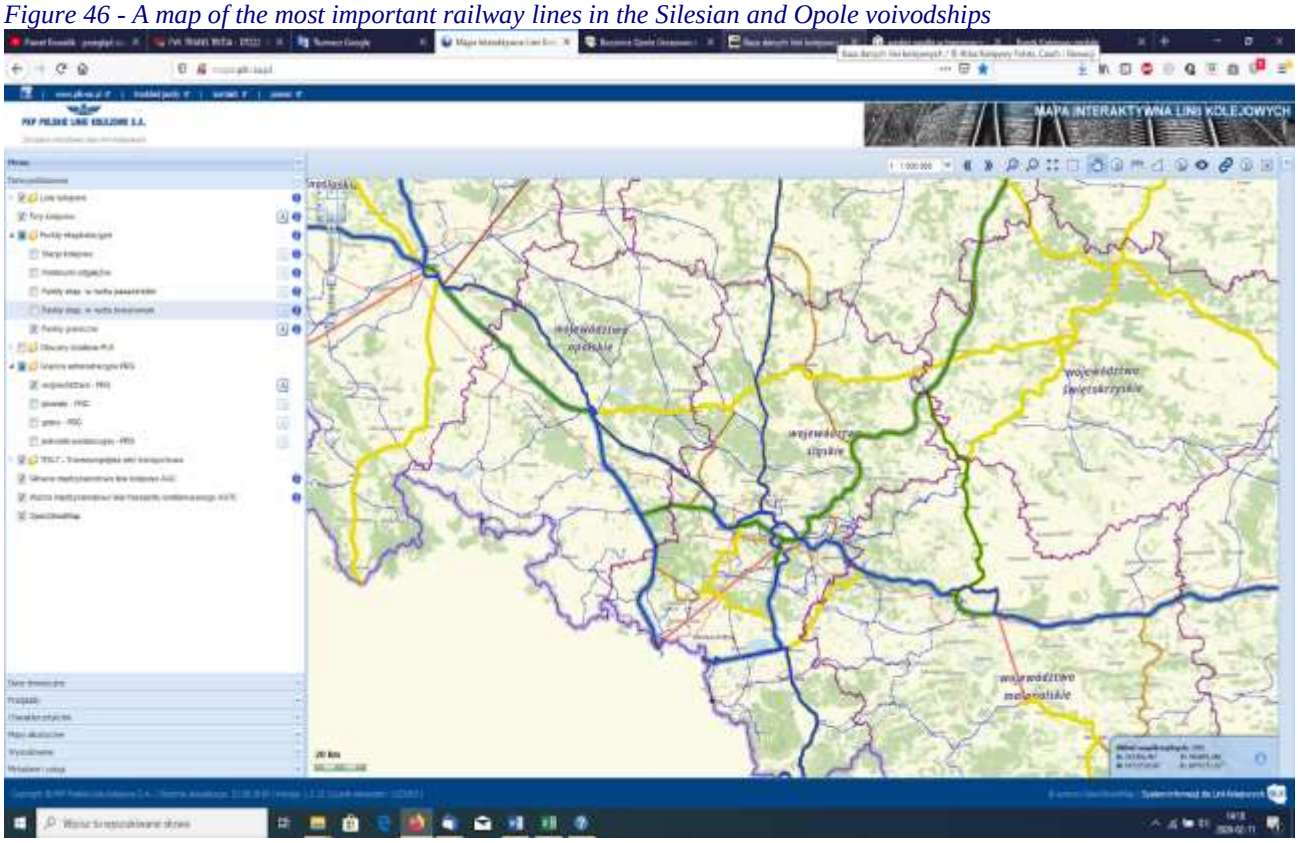
- Małaszewicze Południe: closed tracks and a small number of parking tracks reduce station capacity;
- Zebrzydowice: frequent lack of free tracks.

Freight stations in the Silesia region:

- Dąbrowa Górnicza Towarowa: difficult entry to the station due to insufficient number of tracks, many additional tracks are closed due to poor condition. Due to the growing number of transports, trains are waiting to enter the station at surrounding stations and routes. This problem is reported by many carriers and is even more important as the so-called Huta Katowice and surrounding plants are one of the most important sources of rail traffic in Poland;
- Gliwice Łabędy: carriers signal the need to extend the lift tracks;
- Katowice Muchowiec: carriers postulate the reconstruction of station tracks (two main and four additional) for servicing the Staszic Mine and trains towards Zebrzydowice, Kraków, Dąbrowa Górnicza Towarowa and Gliwice;
- Kędzierzyn-Koźle: it is necessary to extend the directional tracks to a length of 750 m;
- Rudziniec Gliwicki: reconstruction of tracks No. 8 and 10 would increase the capacity of the renovated section of Toszek Północ - Rudziniec Gliwicki.

Currently, the two most attractive, transcontinental rail transport corridors from China lead through Małaszewicze, which makes this transition a key point for the entire China-EU relationship. Both the Baltic corridor and the Trans-Caspian corridors require more transhipments and border checks.

Figure 46 - A map of the most important railway lines in the Silesian and Opole voivodships



7.10.3. Slovakia

From the historical point of view, railway infrastructure is an important mode of transport and its capacity on all main lines corresponds to that. Current infrastructure is experiencing a slight increase in capacity during modernization, as there are mitigations of restrictive sections, an increase in cruising speed and, for selected sections, the overall length of the line is shortened. A specific parameter is the increase of the technical equipment of the signaling equipment, which is built on the level of ETCS 2 and corresponds to all modern parameters of railway transport operation.

Table 94 - Capacity and occupancy rate of routes to and from Žilina node.

Line	Section	Capacity		Free capacity		Degree of utilization		Ratio of utilization	
		Even	Odd	Even	Odd	Even	Odd	Even	Odd
106 A	Kraľovany - Vrútky	153	133	59	40	0,35	0,45	50,90	55,55
	Vrútky – Žilina	147	130	40	26	0,43	0,46	62,70	68,29
	Žilina – Púchov	124	123	46	45	0,36	0,42	57,40	58,70
106 D	Žilina - Čadca	123	136	43	57	0,38	0,29	53,80	47,03
	Čadca – Mosty u Jablunkova (CZ)	126	132	75	79	0,34	0,30	37,40	37,05
106 G	Žilina – Teplička – Žilina	176		124		0,23		26,10	

The even and odd directions are indicated in the name of the section in which the first station is the beginning, the second station the end and the even direction is the train running from the beginning to the end.
As can be seen from the table of affected sections and their utilization, there is sufficient capacity for further performance growth. The main direction of flow of logistics trains is Žilina - Púchov, which continues to Koper port and is used for the KIA car factory. In the future, a problematic section may be Žilina - Vrútky, which connects the Žilina - Čadca and Žilina - Púchov lines and where tunnels are located which limit the total throughput of the entire track section.
There are no significant constraints on the crossing between the Czech Republic and Slovakia, as this infrastructure was set up in Czechoslovakia to eliminate bottlenecks on the entire stretch between Žilina and Bohumin.
There is a major obstacle to a smooth transition at the border between Slovakia and Poland, as there is a limitation on the maximum length of the freight train (350 m) in relation to the length of the station tracks on the line in question on the Polish side. A detailed description of the issue can be found in chapter 5.6.3 in the section on the SK-PL transition.
Currently, the gradual modernization of corridors in Slovakia is under way, which is under preparation for the reconstruction of the Žilina junction, which will significantly reduce travel times for both passenger and freight transport by increasing line speed and improving infrastructure (mainly crossing points). In the previous step, a new marshalling yard was built in Teplička nad Váhom, which is currently equipped with the latest train breaking technology. Within the project of the Žilina node, the selected technical elements of the foundation booth will be completed and the overall connection to the main railway line, the railway station Žilina and the Vrútky railway stations will be improved. The Žilina-

Teplička marshalling yard is the only category A marshalling station in the entire Žilina self-governing region and serves the entire territory of the second most important B-station. There are 17 transport, 5 handling, 7 stabling and 4 other rails in the Čadca cross-border station. At present, this number is sufficient to cover the requirements for carrying out border tasks between the Slovak Republic and the Czech Republic. Currently, a project for the modernization of the Čadca state border - Krásno nad Kysucou section is under preparation. project preparation and is based on current and prospective GVD.
ZSSK Cargo as the largest freight carrier has a long-term problem with the obsolete bus park and the lack of drivers. The situation is also aggravated by the fact that the railway market in Slovakia and the Czech Republic has been opened and competition is increasing the overall demand for train drivers in Central Europe due to the increased number of carriers and the growth in rail performance.

7.11. Unification of regulations between the states of the region TRITIA

7.11.1. Czech republic

There are different railway infrastructure managers (operators) within Europe, national railway regulations for operation, including signaling regulations, are different, in particular there are different national regulations governing route allocation, traffic management information systems, train information transmission, etc. All this hampers the full interoperability and competitiveness of rail freight.

Directive 2012/34 / EU on the creation of a single European railway area, which defines the single European railway area (recast), which provided for:

- rules for the management of railway infrastructure and the provision of rail transport services by railway undertakings established or to be established in a Member State,
- criteria applied by Member States when issuing, renewing or amending licenses for railway undertakings established or to be established in the Union,
- the principles and procedures applicable to the setting and charging of railway infrastructure charges and the allocation of railway infrastructure capacity.

It focuses on three areas:

- opening up the rail market to competition
- improving the interoperability and security of national networks development of railway infrastructure.

The Directive applies to the use of railway infrastructure for national and international rail transport, with the aim of modernizing the rail sector in Europe. This directive included, among others. Directives 91/440 / EEC and Directives of 1st FB repealed: 2001/12 / EC, 2001/13 / EC and 2001/14 / EC.

Interoperability - directive
In the Decree of the Ministry of Transport No. 352/2004 Coll. on the operational and technical interconnection of the European rail system:

Interoperability of the European rail system
For the European railway network, only those parts of the railways which ensure the perfect compatibility of the technical characteristics of the railway infrastructure with the

technical characteristics of the rolling stock used, including the onboard components of all the subsystems concerned, may be used.

The interoperability constituents may be:

- used only if their technical characteristics make it possible to achieve interoperability in the European railway system, while at the same time meeting the essential design and operating characteristics referred to in Part Three of the Decree;
- installed and maintained only in accordance with the provisions of the TSIs.

The European rail interoperability system is divided into subsystems
(a) in the structural field:
1. railway infrastructure (hereinafter referred to as "infrastructure"),
2. energy,
3. line control and command and signaling;
4. airborne control and command and signaling;
5. rolling stock;
(b) in the operational area:
1. operation of railways and organization of rail transport,
2. maintenance,
3. utilizing the integration of the transmission and processing of data and related information ("telematics") in passenger and freight transport.
An overview of the technical standards and other documents containing requirements for the design and conformity assessment of subsystems and interoperability constituents of the rail system and covering the technical parameter criteria, test methods and product specifications are given in the European Union regulations governing technical specifications for interoperability.

Overview of Technical Specifications for Interoperability:

<u>Infrastructure subsystem</u>
Commission Regulation (EU) No. 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the rail infrastructure subsystem in the European Union (from 1 January 2015).
Commission Implementing Regulation (EU) 2019/776 of 16 May 2019.

<u>Energy subsystem</u>
Commission Regulation (EU) No. 1301/2014 of 18 November 2014 on the technical specification for interoperability of the energy subsystem of the rail system in the Union (from 1 January 2015).
Corrigendum to Commission Regulation (EU) No. 1301/2014 of 18 November 2014 on the technical specification for interoperability of the energy subsystem of the rail system in the Union.
Commission Implementing Regulation (EU) 2019/776 of 16 May 2019.

<u>Control-command and signaling subsystem</u>
Commission Decision 2006/679 / EC, as amended by Commission Decision 2006/860 / EC, Commission Decision 2007/153 / EC, Commission Decision 2008/386 / EC, Commission Decision 2009/561 / EC, Commission Decision 2010/79 / EC and

Commission Decision 2012/463 / EU - for cases referred to in Article 7 of Commission Decision 2012/88 / EU (management and provision of the trans-European conventional rail system).
Commission Decision 2008/163 / EC, as amended by Commission Decision 2012/464 / EU (safety in railway tunnels in the trans-European conventional and high-speed rail system).
Commission Decision 2012/88 / EU, as amended by Commission Decision 2012/696 / EU (Control-Command and Signaling of the Trans-European Rail System).
Commission Decision 2013/710 / EU of 2 December 2013 amending Decision 2012/757 / EU concerning the technical specification for interoperability relating to the 'operation and traffic management' subsystem of the rail system in the European Union (notified under document C (2013) 8377), effective from January 1, 2014.
Commission Regulation (EU) 2015/995 of 8 June 2015 amending Decision 2012/757 / EU on the technical specification for interoperability relating to the subsystem 'operation and traffic management' of the rail system in the European Union (Text with EEA relevance) , effective July 1, 2015.

Rolling stock subsystem
Commission Regulation (EU) No. Regulation (EU) No 321/2013 of 13 March 2013 on the technical specification for interoperability relating to the subsystem 'rolling stock - freight wagons' of the rail system in the European Union and repealing Commission Decision 2006/861 / EC shall apply from 1 January 2014.
Commission Regulation (EU) No. Regulation (EU) No 1236/2013 of the European Union of 2 December 2013 on the technical specification for interoperability relating to the subsystem 'rolling stock - freight wagons' of the rail system in the European Union 321/2013, valid from 1 January 2014
Commission Regulation (EU) 2015/924 of 8 June 2015 321/2013 on the technical specification for interoperability relating to the subsystem 'rolling stock - freight wagons' of the rail system in the European Union on 1 July 2015.
Commission Implementing Regulation (EU) 2019/774 of 16 May 2019 Regulation (EC) No 1304/2014 as regards the application of the TSI on rolling stock - noise to existing freight wagons.
(Text with EEA relevance), valid from 15.06 2019.
Commission Implementing Regulation (EU) 2019/776 of 16 May 2019.

Safety in tunnels
Commission Regulation (EU) No. 1303/2014 of 18 November 2014 on the technical specification for interoperability relating to "safety in railway tunnels" of the European Union rail system (from 1 January 2015).
Commission Regulation (EU) 2016/912 of 9 June 2016 correcting Regulation (EU) No 1095/2010 On the technical specification for interoperability relating to "safety in railway tunnels" of the European Union rail system.

Commission Regulation (EU) 2019/776 of 16 May 2019
The list of binding and recommended technical standards and other documents is given in the Annex to the Decree of the Ministry of Transport No. 352/2004 Coll. (amended by Decree of 20 December 2013).

EU logistics and multimodal transport in new corridors of the TEN-T trans-European transport network
European Parliament resolution of 19 January 2017 on EU logistics and multimodal transport in new corridors of the trans-European transport network (TEN-T) (2015/2348 (INI)) (2018 / C 242/04)

Telematic applications in freight transport TSI - TAF
The problem of unification of systems across Europe is addressed by Commission Regulation (EC) No. Amending Regulation (EC) No 62/2006 on the technical specification for interoperability relating to the telematic applications for freight subsystem of the trans-European conventional rail system (TSI-TAF). This Regulation describes the Infrastructure, Control-Command and Signaling, Rolling Stock, Traffic Operation and Management subsystems. It contains information on interfaces between subsystems, train position data, cargo data. train preparation, train running forecast. Information about cars, intermodal units, etc. The Telematics Applications for Freight subsystem mainly defines applications for freight transport, including real-time tracking of freight and trains and management of links to other modes of transport.
This Directive was supplemented by amendments - Commission Regulation (EU) No. Commission Regulation (EU) No 280/2013; 328/2012 and in particular EU Commission Regulation no. Regulation (EC) No 1305/2014 of the European Parliament and of the Council of 11 December 2014 concerning the technical specification for interoperability relating to the subsystem Telematic Applications for Freight of the European Union rail system 62/2006
EU Regulation No. 1305/2014 was later amended again:
Commission Implementing Regulation (EU) 2018/278 of 23 February 2018 1305/2014 as regards the message structure, the data and message model and the wagon and intermodal unit operational database and adopting the IT standard for the communication layer of the common interface (valid from 11.3.2018).
Commission Implementing Regulation (EU) 2019/778 of 16 May 2019 1305/2014 as regards the management of change management (Text with EEA relevance). It entered into force 15.06.2019.

List of European ECTS Directives:
Directive (EU) 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system in the European Union - addresses the unification of ETCS within Europe.
Commission Regulation (EU) 2017/6 of 5 January 2017 on the European Implementation Plan for the European Rail Traffic Management System - timetable for the deployment of ERTMS.
Commission Regulation (EU) 2016/919 of 27.5.2016 on the technical specification for interoperability relating to the control-command and signaling subsystems of the rail system in the European Union (contains a detailed description of the control-command and signaling subsystems and the conditions for implementing ERTMS)

European Rail Traffic Management System (ERMS)

The aim of ERTMS is to replace the different national train protection and control systems and to ensure smooth operation in cross-border transport. It has two parts:

- security - ETCS (European train protection)
- Communication - GSM-R (radio system for ensuring voice and data communication between track and train, based on the international standard of wireless communication intended for railway applications).

ERTMS is a core project of the Control-Command and Signaling Subsystems (CCS): it consists of a trackside part (CCS on-track) and an onboard part (CCS on-board), which means that both rail infrastructure and propulsion must be equipped with ERTMS rolling stock. The main task of the ETCS is to ensure safety and to actively intervene in the management of the train in case of driver failure or error.

In the Czech Republic, it is necessary to ensure the transition from the use of a Class B national train protection system (LS line type train protection), or lines without a train protection part to the use of the Class A system (ETCS).

The implementation of ECTS on individual lines is related to their modernization.

The planned date for the equipment of lines 301B (Petrovice - Dětmarovice) and 305B Bohumin - border of MSK with ECTS system is currently under construction (2017 -2020). By the end of 2020 it should be in operation.

On line 301A in the section Dětmarovice - st.hr. with Slovakia will be equipped with the ECTS system in the period 2020-2022 (by 2020 at the latest). In 2019, preparations for the implementation of this system are being completed.

On the line 301D Český Těšín - Ostrava-Svinov, the preparation for the implementation of this system will be completed in 2020 and its implementation will be carried out after 2023.

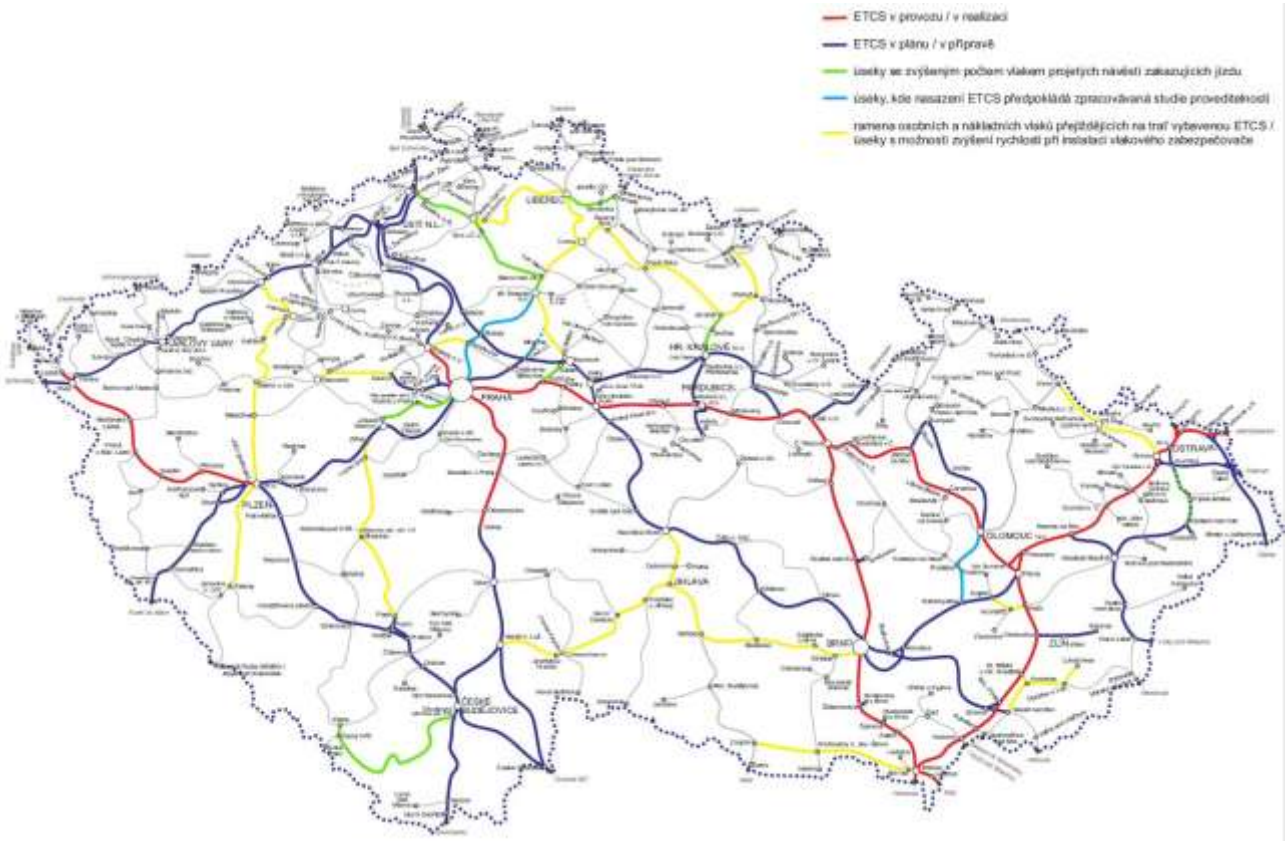
Equipping vehicles with the ETCS on-board part will be supported by the state (in accordance with the Transport Policy of the Czech Republic for 2014 - 2020) by a combination of two tools:

- systematic financing of the purchase and installation of the ETCS on-board part, provided to carriers registered in the Czech Republic, primarily covered by subsidies from EU funds - basic measures;
- by granting a discount on the use of a road infrastructure charge for vehicles equipped with an ETCS on-board unit in the amount specified in the "National and Regional Railways Statement" (in accordance with EP and Council Directive 2012/34 / EU) - ancillary measure.

The first sections with exclusive operation of trains under the supervision of ETCS shall be from 1 January 2025:

1. Decin - Prague - Ceska Trebova - Brno - Breclav;
2. Breclav - Bohumin;
3. Ceska Trebova - Prerov

Figure 47 - Map of ETCS implementation schedule in the Czech Republic

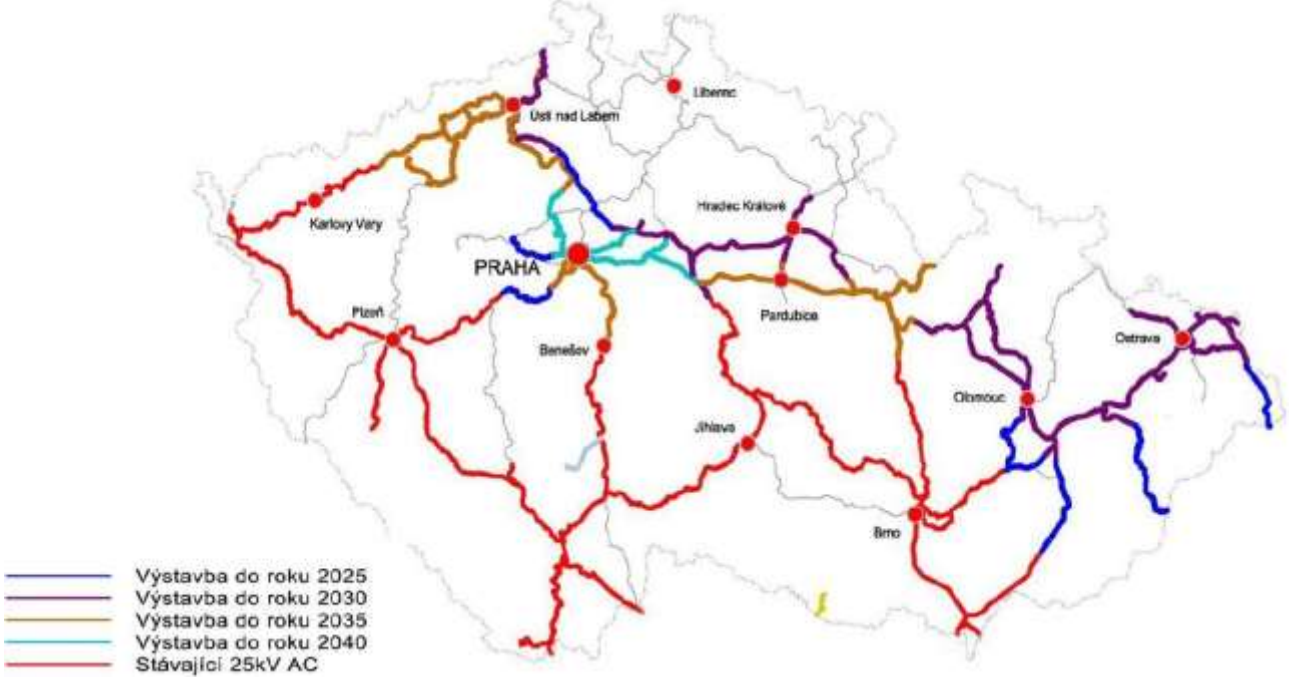


Note: On the Czechowice Dziedzice-Zebrzydowice (GP) border line is planned for the year. 2026th

Obstacles caused by inconsistencies of power systems in the Czech Republic (on the network of SŽ) and also on borders with neighboring states.
Instead of the existing 3kV DC system, it will be operated in the Czech Republic (on SŽDC lines) on 25 kV AC, 50 Hz. Its introduction in the section Přerov - Bohumín - state. hr. with Poland is expected in about 2025. For the first 44 km section between Nedakonice and Říkovice on the Břeclav - Přerov line, project documentation for the building permit and for the construction itself is being prepared. It should be ready by the end of August 2022.

In Poland, it is likely that 3kV direct current will be expected. This causes problems for carriers. They will have to deploy multi-system locomotives on international trains in the direction of Poland.
ŽSR plans to implement the switchover to the AC power system as well as SŽDC in the Czech Republic. Line section Potok - Žilina - Čadca, state border will be transferred to this system in 2025.

Figure 48 - Map of transition of power supply of traction systems to unified AC system 25 kV AC, 50 Hz



7.11.2. Poland

Increasing accessibility can largely take place through the use of solutions other than investment and infrastructure instruments. The observed insufficient accessibility indicates that cities and urban agglomerations use the instruments of shaping transport systems too little, which in turn implies the need to analyze conditions for conducting such policies. The legal, financial framework, incentive and promotion system in the following areas require verification in terms of better matching the needs of local governments:

- impact on the demand for public transport services, including through the use of elements extending the impact of public transport (e.g. appropriate shaping of space, use of organizational solutions);
- spatial and functional integration of transport subsystems, with equal treatment of pedestrian and bicycle traffic along with other modes of movement;
- establishing close (institutionalized) JST cooperation in urban agglomerations for the management and coordination of public transport;
- shaping space limiting transport intensity, modeling a compact and low-carbon city;
- removing barriers and facilitating people with disabilities and people with reduced mobility;
- the formal and legal framework for the creation of transport policy must at the same time weigh effects in the area of increasing accessibility and reducing environmental pressure;
- the aspect of accessibility and meeting the needs of different users in terms of mobility is also present in the multiannual urban mobility plans promoted by the European Commission.

7.11.3. Slovakia

Given parallel deployment in all EU countries, one description of EU legislation is sufficient, given the fact that it applies to all three countries.
The main reasons for train delays on TSOs are described in the section dealing directly with the crossings, and these are based on the information systems deployed from the technical point of view, respectively the possibility of information transfer through the electronic communication channel.
Bilateral agreements on local border traffic have been signed between Slovakia, the Czech Republic and Poland, which simplify the actions to be taken each time the border is crossed between the parties, thus reducing the downtime of the TSOs to the minimum currently possible. the technical and technological capabilities of the TSOs and the information infrastructure of the infrastructure managers and carriers concerned.
The project “Implementation of TSI in the conditions of ŽSR” is currently under preparation. Its main objective is to implement the project of implementation of the Comprehensive Interoperable ŽSR System and fulfillment of the requirements of the European Commission Technical Interoperability Specification concerning the telematics applications in passenger and freight transport from the point of view of ŽSR (as infrastructure manager) as well as requirements defined in ŽSR Master Plan. The implementation of these Regulations will ensure the interconnection of national railway networks within the EU according to the TSI and integrate the information and communication systems of the different infrastructure managers and carriers. The unification of telematics applications in rail transport is a key factor in ensuring the quality of international rail services, especially in the growing segment of international freight.
In the framework of the implementation of the required project, ŽSR will ensure the setting up of in-house processes that fully correspond to the functions of the subsystems of the TAF / TAP TSI. This is expected to achieve the overall interoperability of the Slovak railway infrastructure and also to facilitate the access of other European carriers to the Slovak transport market, which will subsequently be reflected in an increase in the railway transport performance. In terms of overall interoperability implementation, it is required:

- Technical and operational provision of TSI TAF / TAP processes (currently there are no clear identifications of the TAF / TAP TSI and part of the data messages are missing),
- Monitoring and forecasting traffic development, ordering capacity and routes,
- Operational support - operational and basic traffic planning, allocation of railway infrastructure capacity and train paths, real-time monitoring of train movements, elaboration of electronic documents,
- Standardized data exchange between infrastructure managers and carriers across the EU.

7.12. Information systems SŽ, PKP PLK a ŽSR

7.12.1. Czech republic

SŽ Operational Information Systems (SPIS)
SŽ operates SPIS, which are interconnected and interconnected and cover the whole life cycle of the train from the submission of the path request to the calculation of the prices using the train path. Standards defined within the common European implementation of

the TAF / TAP TSI are used for communication with IS carriers. In accordance with the TAF TSI (Commission Regulation (EU) No 1305/2014) and at the same time as the operation of the IS KAPO (automated calculation of the price for the use of the train path) and the related services of SŽ. The terms and conditions are published on the Railway Operation Portal and are also subject to mutual agreement. Connection of the carrier's IS to the SPIS applications is subject to the consent of the authorized representative of SŽ to the data exchange with the SPIS. The basic condition is the assignment of the company number according to TAF TSI and TAP TSI.
The objective of the SPIS operation is to automate the individual processes and activities of the infrastructure manager aiming both at on-line connection with IS of carriers and surrounding IMs through central IS RNE, as well as automated calculation of infrastructure capacity allocation, use of the track by train running and use of provided services.
Detailed conditions and rules for the use of the SPIS are specified in the IS 10 regulation "Regulation for the use of the set of operational information systems of the infrastructure manager (SPIS)".

Information systems used within SŽ
These are several IS, each focused on a specific area. They are interconnected and forward information in relation to the current traffic situation. The basic system is IS KANGO, which contains a comprehensive database of basic data needed for railway operation - basic data on the network, vehicles, etc. - is made up of partial systems:

- KANGO-Kmen - editor of master data on railway network, vehicles, etc.;
- KANGO-Train - for editing trains on the network; the data is acquired by the railway undertaking or the railway operator
- KANGO-Voz - for creating circuits of railway traction vehicles and trains
- KANGO – Pers - for creating train and locomotive crews
- KANGO – GVD - construction of RP and print outputs (tools of RP)

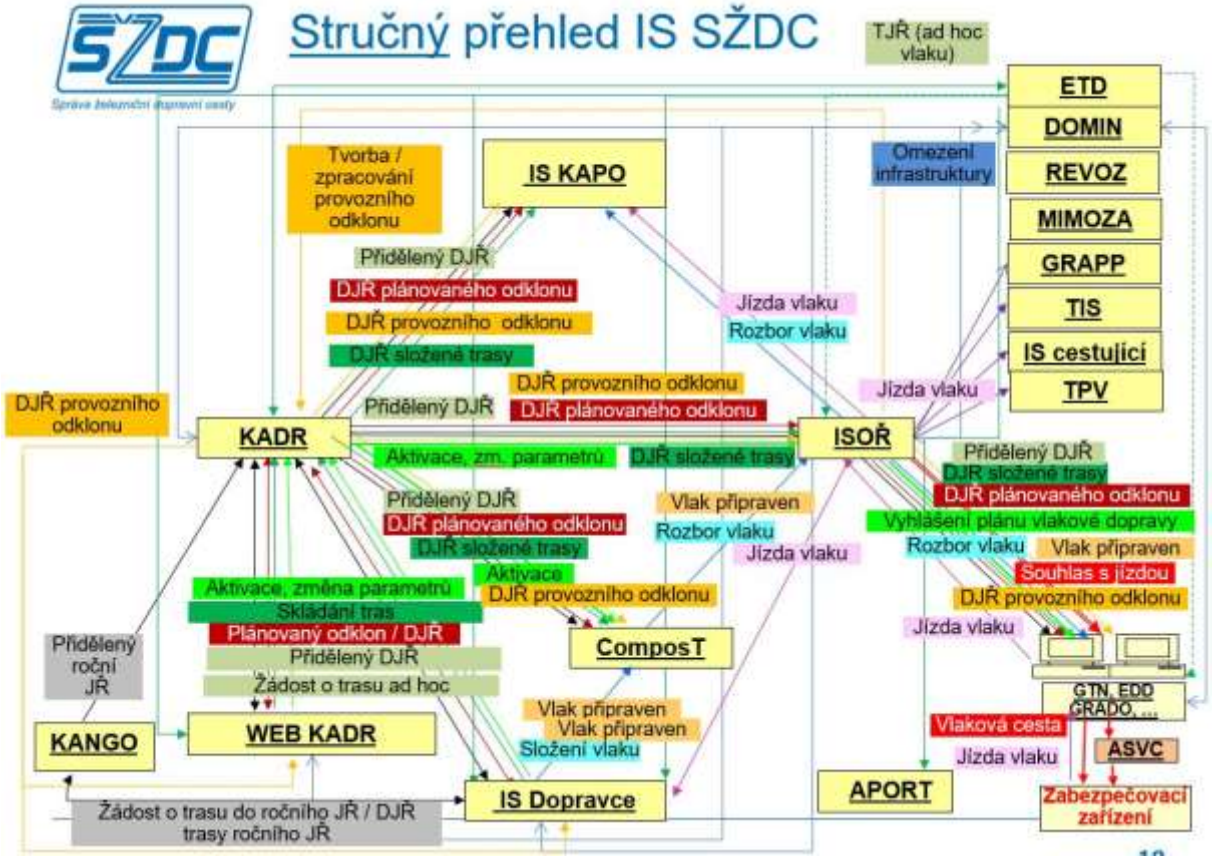
KANGO-Strain contains modules:

- module SR70
- module TTP - Tables track. Ratios
- CRD module - Traffic Management Center
- vehicle module
- Kango GVD module

<u>Other Czech information systems (using data from Kango strain):</u>
ISOŘ - traffic management (using points, sections, tracks, platforms, etc.)
KADR - requests for ad hoc routes, route allocation (uses infrastructure parameters for construction of RP)
KAPO - infrastructure usage fees (transport routes - using points, sections, track tracks)
ComposT - IS for train analysis and train documentation (using points)
APORT - IS for information acquisition Train analysis and Train readiness for departure
DOMIN - traffic restrictions database (using points, sections)
ETD - creates electronic trackside control system for drivers and distributes it to traction units (uses all network data)
EDD - electronic traffic logbook for dispatchers
GRAPP - movement of trains on the map
MIMOZA - IS for information about extraordinary shipments (using points, sections, tracks,

lights, switches, tunnels, platforms,…)
REVOZ - vehicle register
DYPOD - IS displaying railway declaration data for carriers (using points, sections, tracks, switches, safety equipment, track categories, etc.)
CSV - IS for planning of lockout activity
GTN (ASVC), GRADO - IS for the documentation of the course and support of traffic management in the station or section (using points, sections, tracks, lights, switches ...)
GTN - Graphic and technological extension of security equipment
ASVC - automatic train path building
GRADO - Graphic transport documentation
is an IS enabling to keep electronic traffic documentation in an automated way based on the operation of the signaling equipment and ensuring automatic construction of train paths.

Figure 49 - Brief overview of SŽ information systems



ISOŘ
ensures operational management of train movements. It takes the necessary information from the SPIS applications and transmits it in the form of a Train Transport Plan to the IS, providing support for sectional or local operational traffic management. It then takes information from these IS on train running and infrastructure constraints, which it distributes to the IS of the carrier, other SPIS applications and IS of neighboring infrastructure managers in neighboring states (IM).

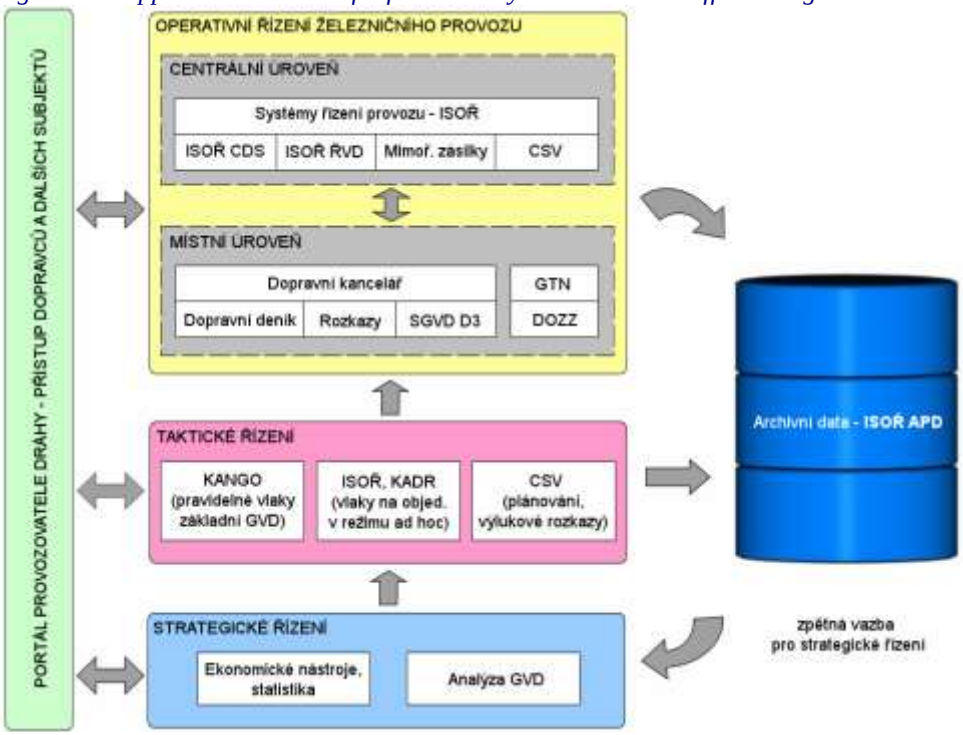
The IS is deployed in 7 control centers with 20 independent workplaces equipped with client applications of these centers according to the regional principle.

ISOŘ DIS - Control Dispatching System for railway traffic
It is an IS for central level control, consisting of real-time subsystems (CDS, ŘVD, VD - train dispatcher, DK - transport office). Allows train planning. transport, disposition with locomotives and drivers, trunk maintenance. and operating data, etc.
It is focused on the collection of primary data, on presentation and evaluation of the quality of the achieved results of railway traffic control at basic technological objects - train, traction vehicle, driver, lockout etc.

ISOŘ CDS - Central dispatching system is designed for centralized dispatching and operational control of railway transport.
It is a central IS for the infrastructure manager and is a subsystem of ISOŘ DIS. It enables monitoring of on-line position of selected trains, graphical display of their position, current traffic situation and forecasts of traffic development, exchange of information between individual trains. places of operation, display of monitoring of lockout activity, GVD analysis, monitoring of selected railway stations performance, special transport module.

ISOŘ ŘVD - Train traffic control is used for direct dispatching control unit. It is focused on presentation of the state and achieved results of traffic management, especially of technological objects - train, locomotive, driver.

Figure 50 - Application scheme of information systems in train traffic management



KAPO
The primary objective of the KAPO application is to provide SŽDC with the calculation of charges for the use of the railway infrastructure by individual carriers. It also fulfills other objectives:

- checking the completeness and full frequency of the operational data from the train journeys required to calculate the charges,
- checking the conflict of price data for individual trains,
- completeness check of train paths,
- provides the basis for the reconciliation of the parameters relevant to the calculation of charges between the railway infrastructure manager and the individual carriers,
- provides records (statistics) of performed performances in hrtkm and vlkm from realized train movements.

KADR
It provides tools for route requests, troubleshooting for free lane capacity allocation, planning and evaluation of irregular ad hoc performance, trading and catalog routes. It is used by the carrier, capacity allocation and the rail operator.
Allows rapid train construction. routes and immediate response to carrier requests, route requests via the web service, including various request reports. When designing a train. ad hoc routes offer the most appropriate free catalog routes and highlight infrastructure constraints (closures).

Modules:
Communication module - contact with external source tasks KADR, ISOŘ CDS, etc.
Control module - primary data consolidation before price calculation, data control
Operating power module
operating performances - vlkm, hrtkm, etc. according to individual customers above the objects ordered and realized performances

Charge Calculation Module
- calculation of the fee according to the “MF Price Assessment”, “Track Declaration” and other contractual arrangements

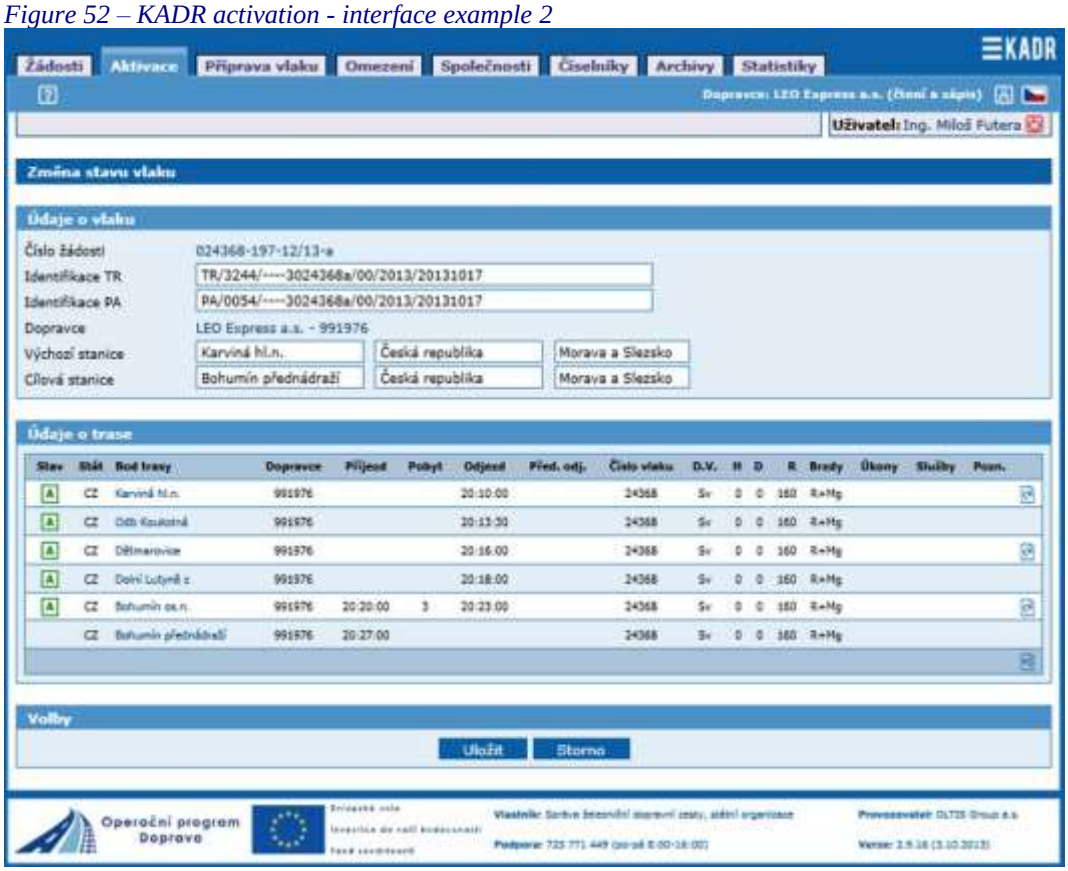
Output module - manager outputs - for SŽ, implementation (work) outputs -
View the results for further editing before submitting or archiving (eg output for reconciliation with customer, invoice attachments, complaint procedure
-Conversion inputs / outputs for SŽ - conversion of files to data structure for their conversion from KAPO system to other systems

Module of price, coefficients and codebooks management
- Editing of catalog rates and coefficients from the “Price list of the Ministry of Finance” and from the “Statement of the runway”, including special price arrangements
-edit of price validity (calendar rates)

Customer Valuation Module - on the SŽ portal, it will enable customers to make their own preliminary calculations using and booking a transport route

Figure 51 – KADR activation - interface example 1

Figure 52 – KADR activation - interface example 2



To uniquely identify a train and successfully exchange data between ISs, each train is identified by identifiers - a unique TRID and one or more PAIDs.
All train paths must be assigned TRID, PRID and PAID.

ID - identifier
TRID ID (Train ID) - train identifier
PAth ID (Path ID) - identifier of the route
PRID ID (Path Request ID) - identifier of the path request
CRID - folder
Identifiers use the same structure and length. Each identifier consists of the following sections:
a) object type - specifies the object type (2 alphanumeric characters). The codes used are:
-TR - TRID - Train ID - business case object,
-PA - PAID - Path ID - DataRP object,
-PR - PRID - Path Request ID
-CR - CRID - Case Reference ID - object folder
b) company number - 4 digital alphanumer. Company code (carrier, IM) given in the CRD or 4 digit national company number
c) Core element - 12 alphanumeric characters
d) variant - 2 alphanumeric characters; basic variant-00
e) period of SP - 4 numerical characters; this is the number of the year in which the RP is mainly conducted
f) date - 8 characters (year - 4 characters, month - 2 characters, day - 2 characters)
g) separator - /

Identifiers are used for two basic types of use:
a) planned object - ID for a specific case (IM business case, data RU), in addition to this type of use, a calendar is required when the object will be valid. length 28 characters
Example: TR / 1154 / 1234567890AB / 00/2011 or PA / 0054 / 1234567890AB / 00/2011
b) day object - it is a planned object supplemented by a specific day of use:
- identifier length - 37 characters
E.g. TR / 1154 / 1234567890AB / 00/2011/20110228 or PA / 0054 / 1234567890AB / 00/2011/20110228,

The IS of the carrier that will send ad hoc route requests to the IS IM must provide these requests with a unique TRID and PRID. If the carrier makes a route request through the KADR web client, it will generate TRID and PRID.
At the same time as the capacity allocation and the data management unit, the IS IM creates one or more data management unit objects with one or more PAIDs for one TRID. The route request and capacity object is identified by a PRID. By combining the planned TRID object with the assigned calendar from the planned object the data RU at the starting station or at the state border point (until the full international implementation of the identifications) creates the precondition for correct generation of daily TRID objects.

TR identification (TRID) is an identifier by which SŽDC systems assign the contents of activation / deactivation, path composition, Train composition and Train ready to relevant trains in SŽDC information systems.
It is necessary to produce and send data communication messages always with the correct identification of TRID or PAID. This is especially true when traveling from abroad

over midnight.
Rules for the creation of identifiers have been issued starting with RP 2016.
The routes of the annual timetable refer to the daily part of the TRID as of the date of departure from the departure station abroad in the allocated route.
Ad hoc routes refer to the daily part of the TRID as of the date of departure from the first point on the SŽDC network.
The daily part of the PAID is always related to the departure from the first point on the SŽDC network.

Compost
The IS, which takes over the data information sent from the IS of the train. It also transfers the relevant data to other SPIS applications. It also makes it possible to retrieve from the carrier's IS data the license number of each driver driving an active traction unit of a train.

The Czech IS shall be adapted to the requirements in accordance with Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the subsystem Telematic Applications for Freight of the European Union rail system and repealing Regulation (EC) No. 62/2006
TAF TSI strictly distinguishes commercial data from traffic data. It distinguishes the following reporting groups:
1. the particulars on the consignment note,
2. train path request (ad hoc requests within the meaning of Directive 2001/14 / EC),
3. train preparation (from formation to departure),
4. Train running forecast (estimated time of occurrence at a particular location)
5. information in the event of disruption to operations,
6. train position;
7. a report on the estimated time of interchange between railway undertakings (EIT) and ETI respectively; the delivery time (ETA) of the car / intermodal unit,
8. car movement,
9. alternation reporting (vehicle replacement report),
10. data exchange to improve quality,
11. the main reference data,
12. various reference files and databases,
13. transmission of documents in electronic form,
14. Networks and communication.

Implementation of TAF TSI in Czech information system (within the train life cycle)
Steps:
0) support activities
1) Route Request
The request for an ad hoc route to information system KADR goes from the information system of the carrier and after its allocation, information is sent to the information system of the carrier. The carrier then sends a request to the information system KADR to activate the train path and again receives a message from the information system KADR that the path is activated and is assigned a data RU. From information system KADR information is transferred to information system KAPO and ISOŘ.
From information system KANGO, information about the timetable for the train goes to information system KADR.
2) Preparation before departure and extraordinary

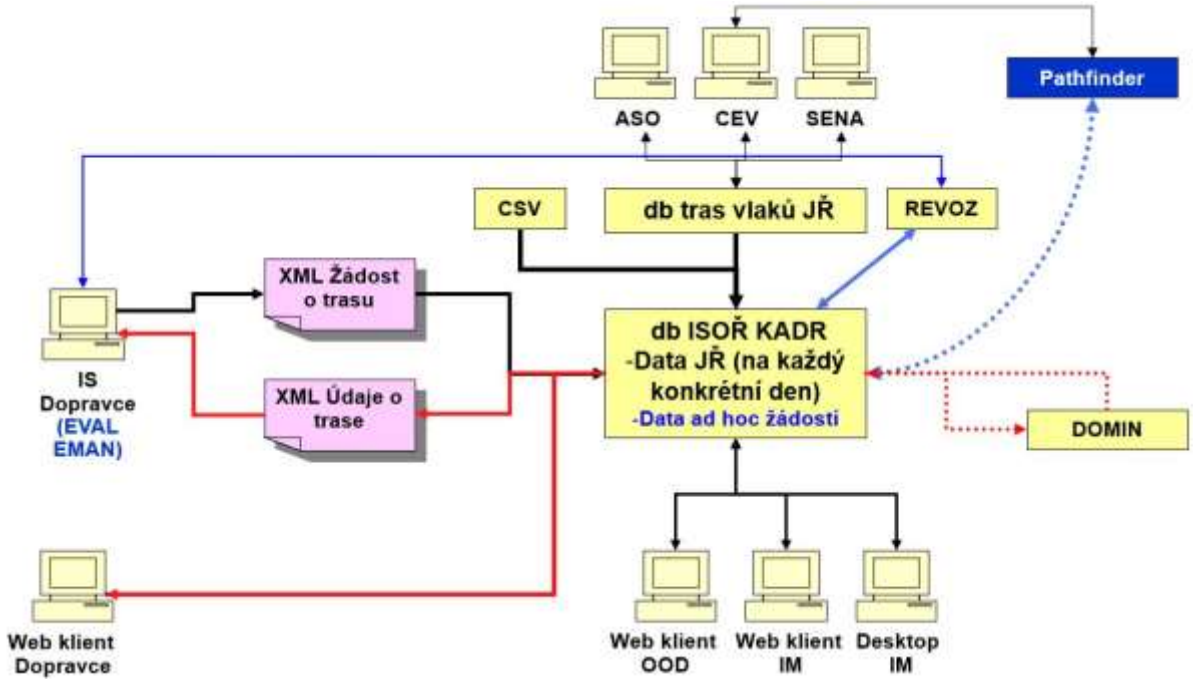
The carrier sends messages from its information system about train composition and train readiness for departure. The train must be introduced in the shift plan. ComposT information system receives messages.
From IS Carrier data are transferred to information system APORT (train composition, train analysis), from information system Carrier and information system COMPOST data (train analysis, train readiness for departure) and from both IS to ISOŘ. The information is also sent from the IED to the EDD (data JR, route activation - shift plan, train analysis and train readiness for departure). The shift plan is the current RP for the nearest time period.
3) train running
train position monitoring, including train running forecast and train disruption
Information about train running and reasons of disruption is transferred from GTN to ISOŘ and further to IS KAPO.
4) invoicing
Payments for the use of the transport route - from information system KAPO are sent information for invoicing - reconciliation of the performance to the information system of the carrier and he / she confirms the performance performed by the carrier.
5) statistics
Statistics are generated from operational data according to various criteria.

Table 95 – The connection between the SŽDC IS within the train's life cycle.

The name of the train phase	**Coverage of a given phase by the information system**
Train path request - order the train path and then activate the ordered train path	KANGO, KADR
Train preparation before departure - producing train analysis or train reports and preparing the train before departure	APORT, COMPOST, ISOŘ ŘVD
Train Ride - Train Ride Tracking including the train running forecast and problems of train disruption	Central level: ISOŘ CDS, ISOŘ APD Local level: trffic log, ISOŘ SGVD (completed GVD), GTN
End of train journey - calculation of charges for using the infrastructure, reconciliation with the carrier and invoicing of performance	KAPO

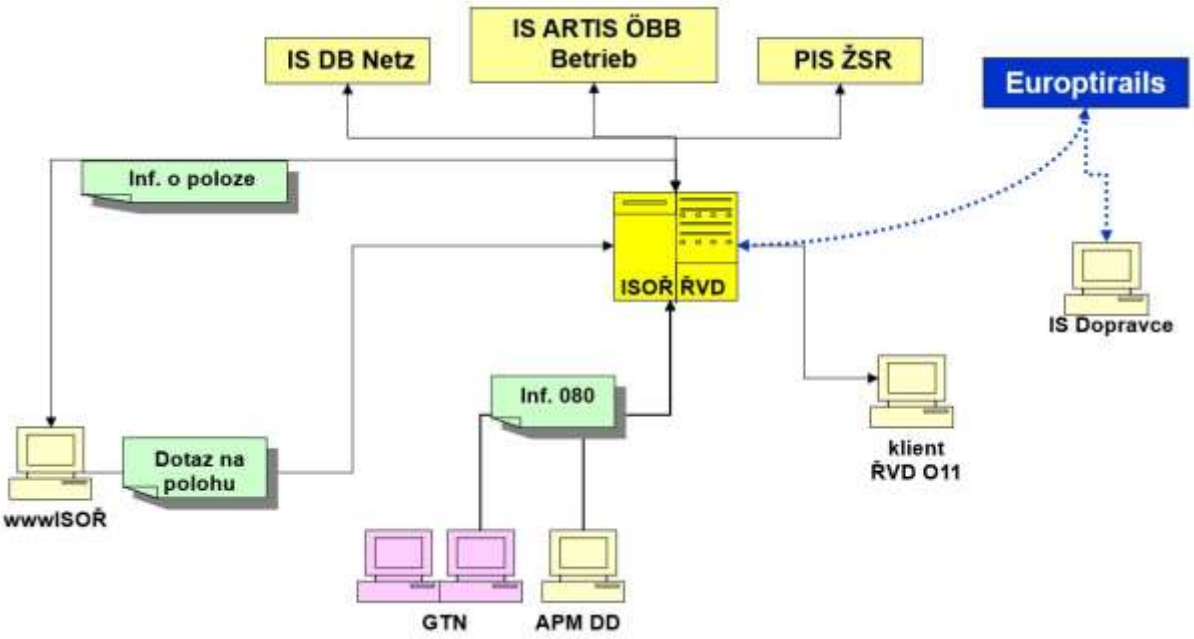
Notes:
ISOŘ APD - operational management information system, primary data archive
ISOŘ SGVD - information system on fulfilled GVD
GRAPP - graphical presentation of the current position of the trains on the map of SŽ network, current data from the last recorded station

Figure 53 - Allocation of railway capacity and train paths (link to RNE - Pathfinger)



Note: Older IS SENA has been replaced by IS KADR)

Figure 54 - Train running information transmission (between IS SŽDC, DB Netz, OBB, PIS ŽSR, IS carrier) and RNE TIS)



Note – Information system PKP PLK is missing there because its connection with information system SŽ is not working yet

GTN - graphic and technological extension of security equipment
GTN provides transmission of information between stations and dispatchers, transmission of train numbers within the security equipment.

- on the track. and traffic depicts practitioners. realization of transport (train record, fulfilled GVD, service protocol)
- keeps traffic statistics
- creates a prognostic. transport model (continuous update) Train path position and transport evaluation)
- forward transport planning
- connected to IS ISOŘ - forms a gateway between security equipment and IS systems (CEVIS, MIS, CDS)
- it is also possible to track several track segments at the same time

CEVIS - central wagon information system - monitoring of trains and wagons (for ČD Cargo - permanent records and foreign wagons of temporary records) and consignment tracking.
Information about real-time basic objects that are provided to other information systems (ISOŘ, MIS, APM-PPS). Train information - list of wagons default. train, departure from east. station, passing the checkpoint, stopping the train (for operational reasons), leaving the train after stopping, renumbering the train and changing the destination, hanging the wagon to or from the train, ending the journey.
For ČD Cargo, a.s. was replaced by VLASTA and PRIS, which gradually took over all CEVIS functionalities.

PRIS (Operational information system)
To support the activities of ČD Cargo, as employees. primarily to cover all processes of the train-forming station (technical and commercial inspections of wagons and trains). It contains a wagon operation database module.

VLASTA (Train Station)
Information system is a subsystem of PRIS and is basic. Information system designed for process coverage and operation activities of train-forming stations.

APM PPS
Automated Work instead of a border crossing point. It monitors and provides information on technological activities in cross-border stations when working with the transitional and delivery lists.

RailNetEurope - international cooperation between railway operators
It was set up in 2004 as an initiative of several IMs (infrastructure managers) and capacity allocators (ABs) to set up a pan-European organization to facilitate their international activities. Its task is to harmonize and optimize pan-European timetable production, sales (including the creation of the Track Declaration), traffic management and after-sales services (eg reporting). RNE provides support to rail carriers in international passenger and freight transport and seeks to increase the efficiency of IM and AB processes.
In 2013, the first six RFCs (International Iron Corridors) and the Corridor OSS (C-OSS) network were launched, and in 2015 another three RFCs. RNE has become a coordination

platform for RFC in terms of traffic management.

One Europe - One service
RNE members have established one OSS contact point (OneStopShop) in each member country. The customer may choose his / her contact OSS to provide assistance with information regarding access to the rail network only after requesting an interstate route and a train running report. A contact point OSS - O11 - Operational Operations Management Department was also created within SŽDC.

RNE PCS Tools

PCS - Path coordination system
PCS is a web-based application provided by RNE IM (Infrastructure Managers), AB (Route Allocators), RFCs, carriers and route applicants, for communication and coordination processes for international route requests and route offers. It assists carriers and applicants in their mutual coordination when applying for route studies and applying for international routes. RNE also operates the PCS Integration Platform (PCS IP) as a direct communication channel between PCS and national carrier systems, IM and AB enabling two-way data exchange.
Enables automatic synchronization of international train path request data between national systems and PCS.
Since November 2013, a pre-arranged path (PaP) tool for work (publishing, applications, allocation) in accordance with EU Regulation 913/2010 has been in operation.
More detailed information is available on the RNE website: http://pcs.rne.eu/.

CIS - Charging information system
CIS is an information system on rail use charging for applicants operated by IM and AB. This web-based application provides quick information on the prices associated with the use of the European railway infrastructure and makes preliminary price calculations for the use of international rail routes within minutes. It is an application covering various national rail infrastructure charging systems (including shift fees, station charges, etc.)
More detailed information is available on the RNE website: http://cis.rne.eu/.

TIS - Train information system (informally Europtirails)
TIS (Train Information System) is a web-based application that supports international train traffic management by delivering international passenger and freight train data on the RNE and RFC corridors from home to destination. It provides real-time train data directly to users via the Internet and generates reports (TAF TSI) based on historical data. A specific function for terminals on corridors has also been developed to benefit from the exchange of information within the TIS.
TIS Data Portfolio:

- current and previous train positions (train running information),
- agreed daily timetable information (agreed timetable reports - TCCCom),
- Delay information and delay reasons (delay reason report).

The reporting function allows monitoring and analysis of train and delay information.
Data Portfolio Reporting Features:

- accuracy and delay analysis,

- data quality analysis,
- System performance analysis.

TIS has so far been mainly optimized and is now able to process both incoming and outgoing TAF TSI messages from / to IM and outgoing TAF TSI messages to carriers. More detailed information is available on the RNE website: http://tis.rne.eu/.

Czech IS KANGO, KADR and COMPOST cooperate with information system DISC EMAN and DISC OŘ (ČD Cargo), which are connected with information system RNE PCS in Vienna in connection with ordering routes to annual RP or ad hoc routes of international trains using routes running on international freight corridors .
ISOŘ and information system at the station level on the SŽDC network cooperate with information system RNE TIS (IS about trains) in Vienna.

There are other IS used in Europe:
RSRD - Rolling Stock Reference Database - rolling stock database (for international trains)
WIMO - Wagon and Intermodal Unit Operational Database - database of wagons and intermodal units (for international transport)
PATHFINDER - system helping to coordinate the RP of international trains,
EUROPTIRAILS - used for online tracking of trains running on European corridors
ORFEUS - international waybill exchange system
ISR - truck monitoring

Information system Pathfinder - it is a communication tool that ensures mutual cooperation of carriers and capacity allocators, including their own information systems in defining applications and subsequent construction of interstate train routes. This information system is developed by RNE and is offered to carriers free of charge. It serves for submitting late requests for train paths to RP and as hoc requests. It is connected with the Czech information system KADR.

Figure 55 - IS TIS network overview, train info, train path request, GVD, spatial diagram (GVD), train connections

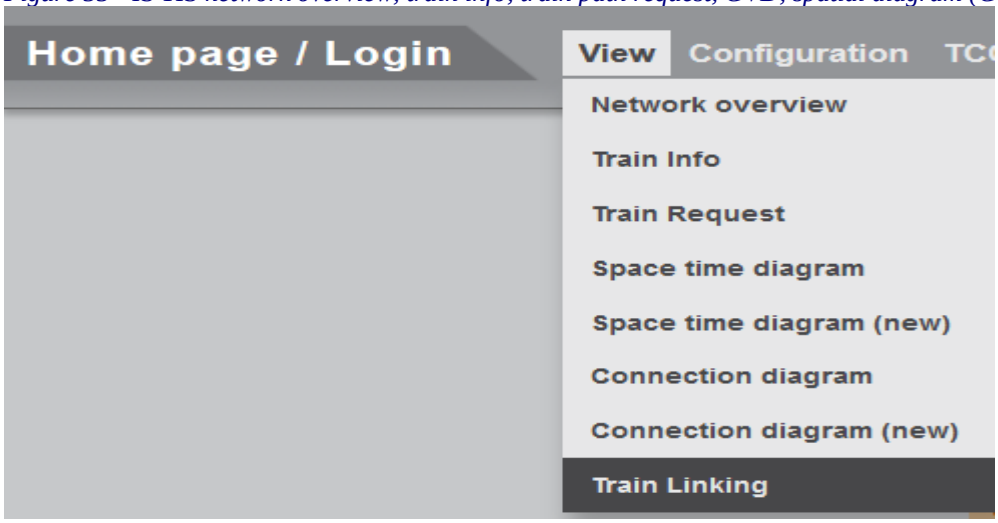


Figure 56 – Example of manually selected train

Figure 57 – Display of manually selected train

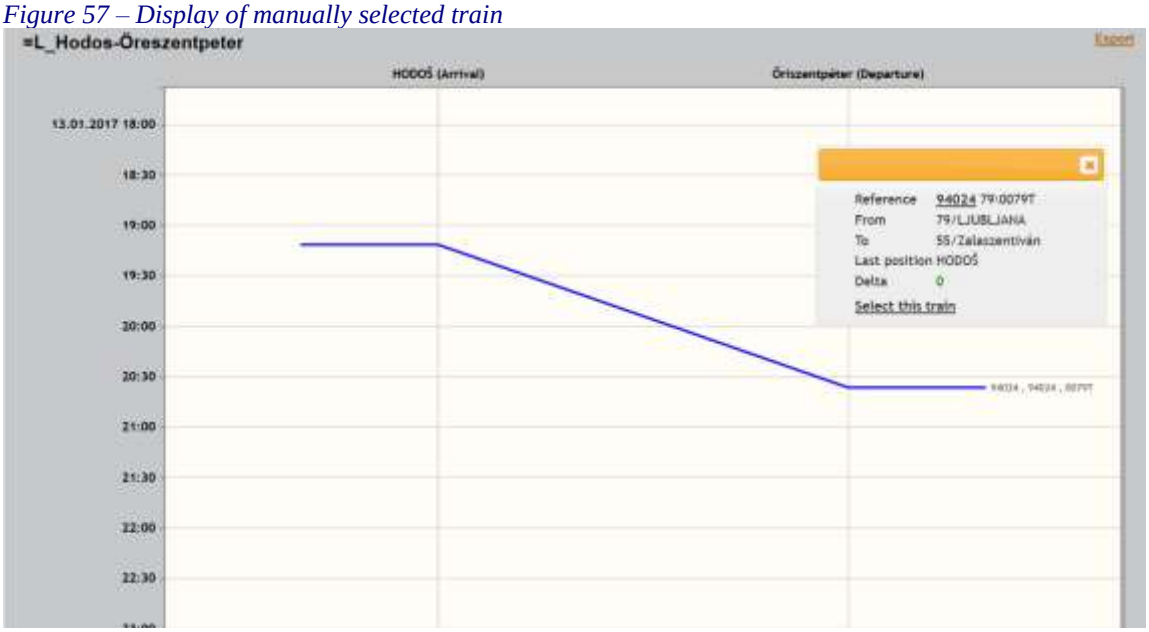
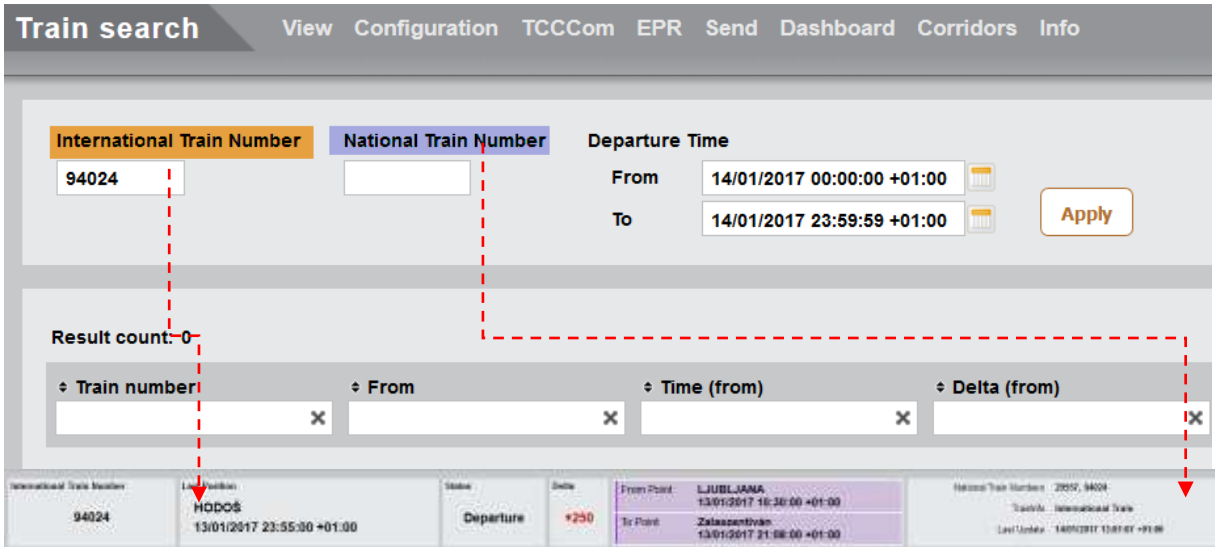


Figure 58 – Train Info / Train Search Page - train number search (international and national train number)



Information system DOMIN (Db Infrastructure Restrictions) - IRN DB
Information system, which contains a database of all infrastructure restrictions operated by SŽDC that affect the available railway capacity.

Information system restrictions
planned closures - from CSV (Central server closures), own assignment (VSDZ - exclusion of transport employees service)
limitation of train parameters (line class, dangerous goods, cross section)
unforeseen closures (accidents, breakdowns)
for each restriction there is a list of affected routes (ISOS CDS, KADR)
Information system is closely connected with KADR, CSV and ISOŘ CDS

CSV (Central Server Exclusion)
Information system for the creation of a plan of closures on railway infrastructure and preparation of processing of closures including orders for closures. For other information systems, it provides all necessary information on planned closures and their impact on the railway infrastructure.

Carrier Information Systems (ČD Cargo, a.s.)
DISC - EMAN (Editing, Modeling and Analysis of Freight Plan)
It will address the issue of the optimal train formation plan. Based on historical data, view. Different variants of grouping wagons into relations (wagon routing at individual stations) will be determined in the data (on volumes of transports and closures). Subsequently, it will be possible to determine the required number of trains and their contents (assigns sessions to trains), as well as the necessary train norms and time position requirements. The variants will be compared according to economic criteria (valuation formula and cost rates used). Required objects (locomotive cycles, shifts of operational staff, occupation of individual workplaces) are assigned to the planned trains. A unified database of trains, train formation data and a uniform interface for the capacity request to SŽ (KANGO, KADR) according to the TAF TSI will be created.

DISC - APS CS (Advanced cargo planning and scheduling)
It supports short-term planning and operational management of traction units and

personnel. It provides an interface for work with employees - evaluating work performance, importing data on the course of shifts and their incorporation into the records (linked to economic indicators). It enables communication between the application and the employee via SMS. The data will be used to record the attendance of employees of the operation and to record the status and performance of HV. There is also a record of the last passage of individual tracks and sidings by the driver (so-called meeting), preparation of a meeting card based on traffic data, records of meeting on the map for individuals and groups of employees or records of knowledge of workplaces and knowledge of individual locomotive series.

DISC - operational management
The module integrates currently used ISOŘ systems. It solves the issue of support for operational management of trains. It is intended for all dispatchers (train, locomotive and shift managers in individual areas) and will be used to support the creation of transport plans, including links especially to the infrastructure manager systems. It will be possible to monitor trains in graphical (in the map) and tabular form, including depiction of the current position of locomotives and drivers or data on occupation of individual workplaces at all stations. The module enables train scheduling, ordering of train path, activation, deactivation of train path (part of train path). It enables sending information about train composition (train analysis), information about train readiness for departure. Feedback will be provided on the status of individual requests, and on current and planned closures.

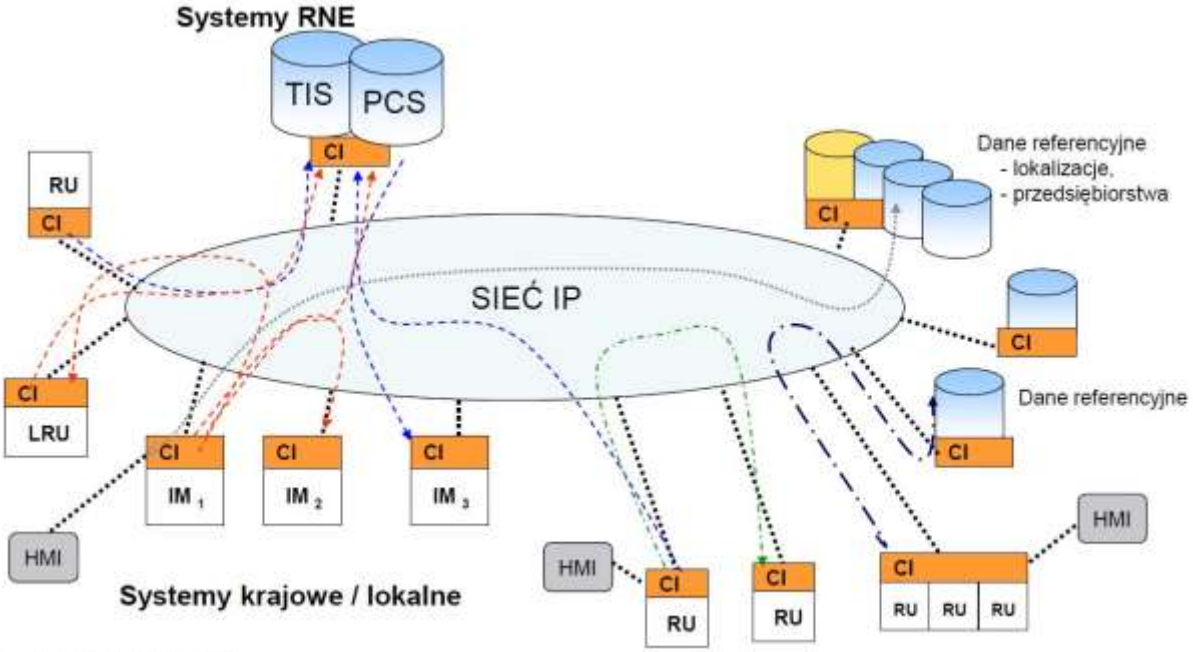
Information system for rail vehicles
Electronic control systems - they replace paper control systems at the driver's station, they are extended with track data. Ratios. Supports variant routes for one train number across different transports. Points and different calendar. days. It is a prerequisite for unification within Europe - the exchange of RP data between infrastructure managers.

EVAL - Records of trains and locomotives
It allows to plan, monitor and evaluate the performance of trains, locomotives, wagons or iron staff. network and sidings. It provides an overview of the order - order acceptance, transport planning, ordering, implementation, invoicing and cost accounting.

7.12.2. Poland

The basic PKP PLK information systems according to the TAF TSI are:
SKRJ –System Konstrukcji Rozkładu Driving System
SEPE –System Ewidencji Pracy Eksploatacyjnej (performance recording system, supports dispatchers)
POS –Prowadzenie Opisu Sieci (railway network description)

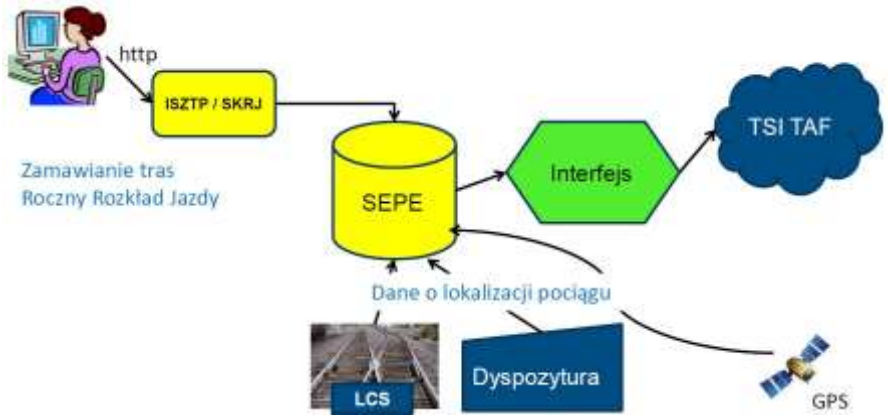
Figure 59 - Data transfer process between RNE and national systems (infrastructure managers and railway undertakings (according to TAF TSI)



CI - Common Interface

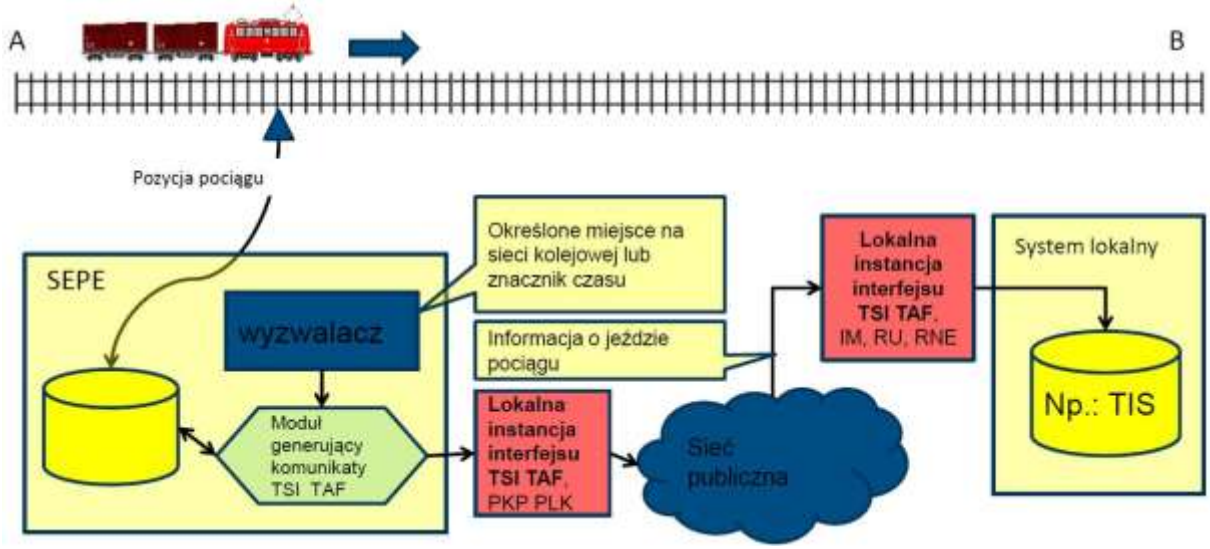
Notes:
TIS - train information system
PCS - route coordination system
CI – common interface
RU – railway undertaking
LRU – lead railway undertaking
IM – infrastructure manager
IHMI - manual user interface (can be manually submitted and removed)
Data referencyjne - Reference data

Figure 60 - The process of transferring operational information related to train running



Notes:
zamawianiwe tras – paths ordering
roczny ryzklad jazdy (RRJ) – year schedule
interfejs – interface
dane o lokalizacji pociągu – train position informations
LCS – Lokalne Centrum Sterowania – Management local centre
dyspozytura – dispatcher workplace
TSI TAF – reports structure

Figure 61 – Train position information



Notes:
pozicja pociągu – train position
wyzwalacz – releaser
komunikaty TSI TAF – reports TAF TSI
określone miejsce na sieci kolejowej lub znacznik czasu – specific location on the rail network or time
sieć publiczna – public network
system lokalny – local information system
Informacja o jeździe pociągu – train position informations
Interfejs – interface

Types of messages handled via the CI (CommonInterface) PKP PLK interface:

- Contracted Time Table (Schedule Report)
- Train Running Information Message
- Train DelayCodeMessage (message - train delay codes)

ISZTP - Internetowy Systeme Zamawiania Trasy Pociągu (internet train ordering system)
A web-based application that allows licensed carriers to electronically handle route requests across different types of RP.
Functions:

- submission of applications within the RRJ (annual RP), within the update of the RRJ, within the IRJ (individual RP), an overview of submitted applications sale of catalog routes
- change of train parameters (traction, gross weight, etc.), cancellation of train path GVD
- linking train composition - which wagons switch to another train at what station and at what time
- dates (type of train, train composition, type of wagons, etc.)
- documents - local border arrangements, lockout schedules, reports and current. restrictions on infrastructure, technical regulations for traffic stations,

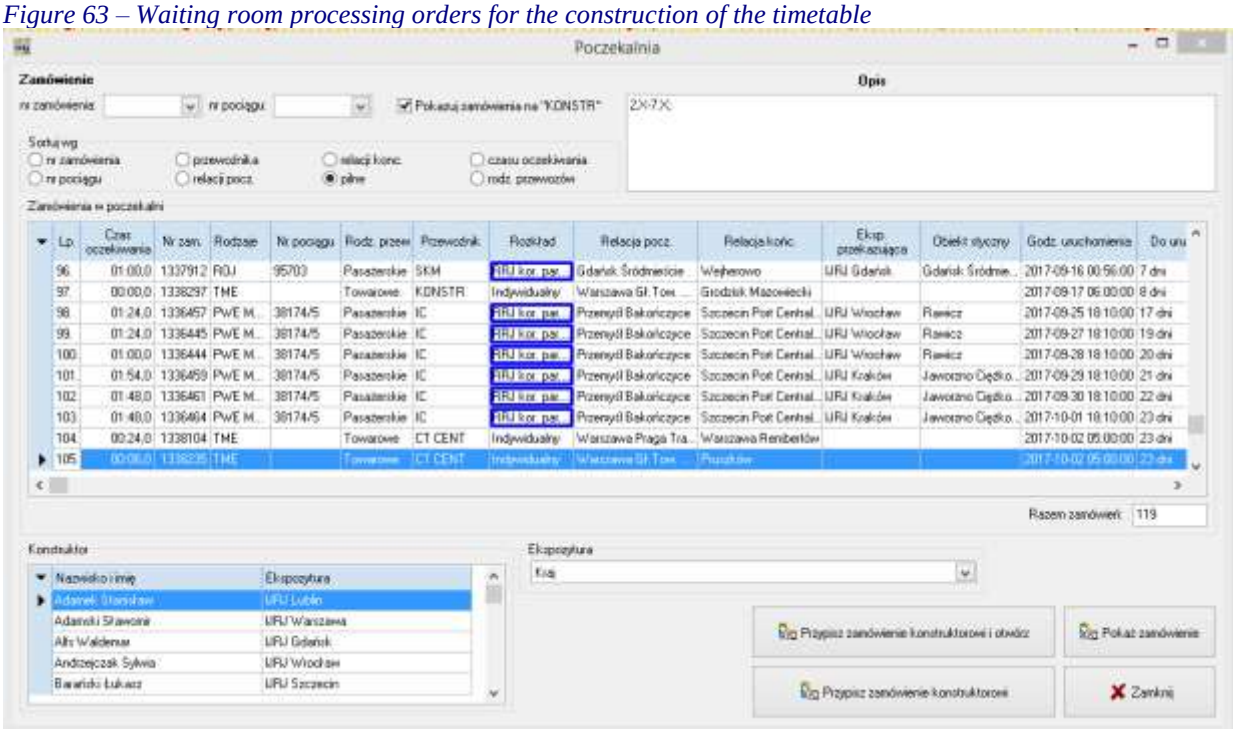
Figure 62 – Train path request - PKP web form

SKRJ - construction system JŘ
https://skrj.plk-sa.pl/ web interface through which train path requests are submitted

Modules:

- GVD (route / time)
- Waiting room for applications - waiting for the designer of the RP
- Traction calculations - calculation of running time of a train using parameters of the railway network (POS - Prowadzenia Opisu Sieci), train composition parameters, traction parameters
- Electronic route request
- Construction reports
- Line closures
- Specifications - a list of applications subject to fees for processing the RP or accessing the SKRJ application
- Statistics - sale of catalog routes, construction of IR within IRJ (individual IR), applications not accepted for implementation
- Business data - for carriers (data on the exchange of wagons between trains), business information - train composition, type of wagons) and for PKP PLK. S.A. (track occupancy)
- Map of the railway network

Figure 63 – Waiting room processing orders for the construction of the timetable

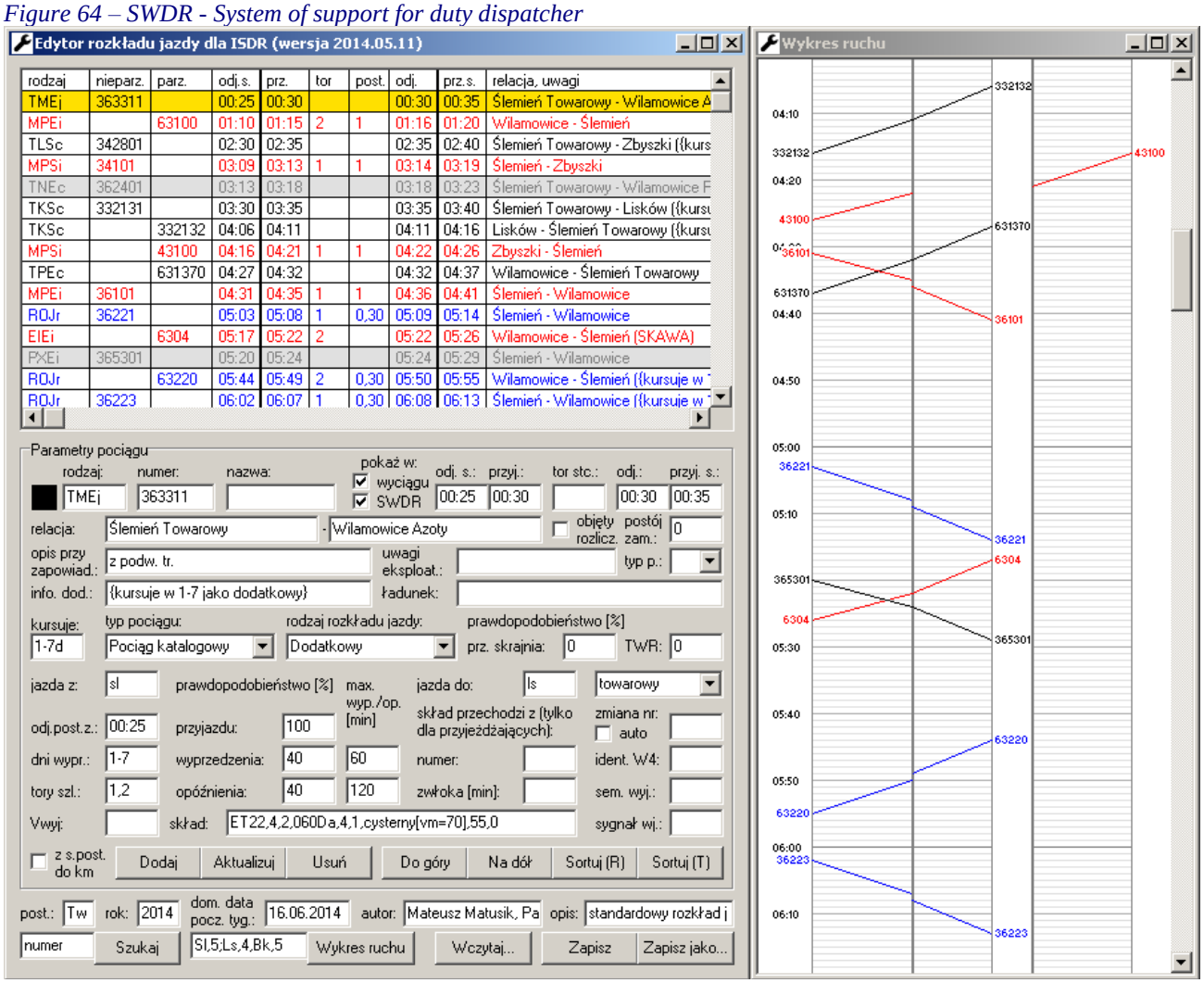


PKP PLK distinguishes between the following types of timetables in the Railway statement (Regulamin Sieci):

- RRJ - annual train timetable
- IRJ - individualized train schedule
- ZRJ - substitute train schedule - a substitute train timetable developed as a result of a change in the train timetable resulting from planned investments, repairs or maintenance of railway lines in which requests for train path allocation are not taken into account
- WRJ - internal train timetable - internal timetable intended for PLK employees and carriers
- PLK catalog - offers of train paths for which RP are prepared for the period of validity of annual RP, based on parameters accepted by PKP PLK
- Train timetable study -the design of the train control system, future input information concerning the route and the journey time, allows the estimation of train running costs
- Train movement graph - GVD - train transport icon

And also these kinds of loads. trains:
The first and second digits indicate:
1) TA - priority international. transportation,
2) TC - international full truck shipments intermodal
3) TG - international mass and border transport
4) TR - international distributed (single wagons and groups of wagons)

Figure 64 – SWDR - System of support for duty dispatcher

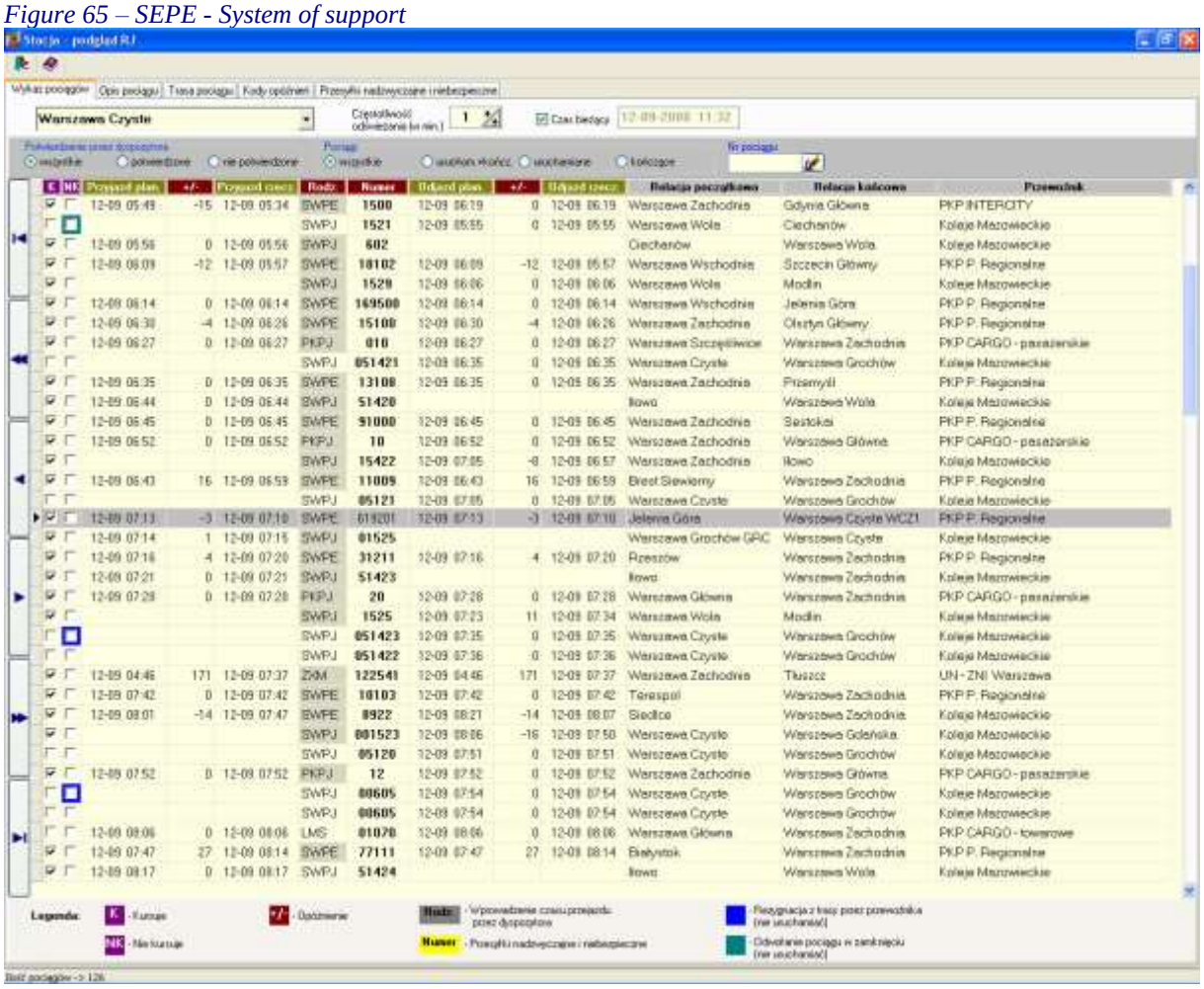


SEPE

For a given station and time it provides data:

- list of trains (all, confirmed by the dispatcher, unconfirmed, in running, delay, all trains, running, ending, running and ending)
- train description (national, international, train name, order number, carrier, train type, start and end stations, type of train station, route request number, date of request, applicant, train being tracked canceled , more information about cargo)
- train path (planned and actual arrival and departure and deviation),
- delay codes (who caused it, cause, delay, localization - location, cause description, location description, station, company and carrier)
- oversized and dangerous consignments

Figure 65 – SEPE - System of support



Notes:
K – kursowanie pociągu – train running started
NK – nie kursuje – train will not go
przyjazd plan a rzeczwisty - planned and actual arrival
odjazd plan a rzeczwisty – planned and actual departure
rełacja poczantkowa – starting station
relacja końcowa – terminal station
przewoźnik – carrier
potwierdzone - trains confirmed by the dispatcher
wszystkie – all trains
uruchamiane - trains in operation
kończące - ending trains
TWR - dangerous goods of high risk
MSN - oversized consignments (PLM - oversized loading gauge, axle pressure exceeded, gauge)
KWR – train KWR number, ie order number

POS (Prowadzenie Opisu Sieci) - Description of the railway network

Application:
POS - basic database
POS - Raport
ZMIPEL or e-POS

It contains data - database on equipment on the railway network, objects, lines, rails for construction of railway stations, parameters of network elements, organizer. units, PPS - border crossing points, restrictions on infrastructure. Data is also used by other

applications. The technical parameters of the tracks - max. Speed, track plan, track profile, axle pressures, starting speed, ban on spraying,
running without power, etc.

SILK (System Informacji dla Linii Kolejowych) - railway network information system
most important modules:
Linear reference system (LRS) - level crossings
Module Real Estate - Objects on Infrastructure
Documentation module - text documents in relation to point, track, area, drawings, diagrams, maps, aerial photographs, etc. Data exchange in relation to authorities, design firms, etc., information on document circulation, etc. Changes in projects introduced into system.
Interactive Map (MILK) - interactive map of PKP PLK railway network (http://mapa.plk-sa.pl/)
Contract module
Access rights module

ENI (Ewidencja Nieruchomości) - real estate register
evidence of land, buildings, taxes and usage fees, valuation of technicians. condition

PKP Cargo information systems

OMIS - Supporting information system for freight and fleet

Applications for registration
EPT (Ewidencja Pojazdów Trakcyjnych) - locomotive records
records of all locomotives for passenger and freight trains intended for train movements and to shove
EWAG (Ewidencja wagonów) - vehicle registration
Overview of the current state of wagons, structure of wagons ie types, repairs and modernization of wagons, evidence of costs connected with repairs of wagons, utilization of wagons and inventory
GPW - management of private and rented cars

Commercial freight support system
OHPT - Commercial service for freight shipments
UMAK - acquisition contracts
ON - fee calculator
RZK - International Settlement

Group of applications for vehicle management and tracking
KPS - operation guide in stations
ZPWO - return of empty cars from abroad
WIP - trains and wagons

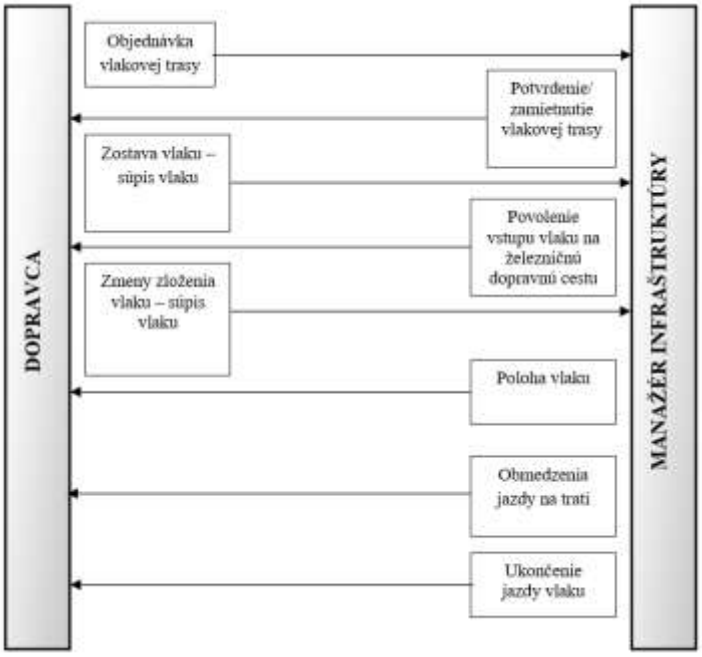
ERTMS
The development challenge is to popularize in Poland the infrastructure for supplying motor vehicles with alternative propulsion: electric vehicle charging networks, natural gas

vehicle refueling networks and (when cost efficiency is achieved) hydrogen refueling networks for fuel cell vehicles. At the same time, the ERTMS system (European Rail Traffic Management System) is being implemented on the railway network as part of the modernization of the main railway lines (concerning the component of the European Train Control System - ETCS or the GSM-R system). The implementation of this ambitious and European project is carried out as part of horizontal projects or line projects. To achieve the full benefits of its implementation, it is important to ensure interoperability in the EU. As part of line projects, the ERTMS component is one of the investment tasks, and its implementation depends on the implementation of basic track and rail-related works, which means that the process is delayed in relation to the initially planned schedules. The implementation of the ERTMS system on the Polish rail network will definitely improve the capacity of the rail network, ensure interoperability with the EU rail network, improve safety in rail transport and improve the comfort of travelers (including by reducing travel time). At the same time, by 2030 ERTMS is planned to be deployed on 6,736 km of main railway lines. Activities of rail carriers related to the implementation of ERTMS on-board equipment are complementary to infrastructure investments.

7.12.3. Slovakia

On the side of the infrastructure manager, in terms of operational processes, the business processes are supported by information systems ensuring the supervision of the railway infrastructure and railway traffic management (track and station interlocking equipment). In addition to these two groups of basic information systems, these are systems for ensuring communication with other infrastructure managers in terms of traffic infrastructure capacity management on the network of other railway administrations and decision support systems (management information systems). Among the many IT projects that ŽT has developed and currently operate for its largest customers, the following projects are of key importance: Technological information system "TIS" for ŽSR - traffic management system and infrastructure information system.
As an infrastructure manager, ŽSR operates information systems to support railway traffic management and capacity allocation (infrastructure manager).

Figure 66 – Activities and information in relation between the carrier and the infrastructure manager



These information systems and applications are:
a. TIS / Operational Information System
b. Train Dispatching System (VDS)
c. Train Track Location (TPV)
d. TIS / Infrastructure Information System
e. SAP economic information system
f. Electronic timetable 'ELIS'
g. EDYN Timetable System (ZONA CP-VT)
h. Systems for allocation of train capacity in international traffic (PCS, TIS, PIS)

TIS / Operational Information System

The Operational Information System (PIS) is a basic IS built for IT support of the core business manager of the railway infrastructure of ŽSR, which is based on proven technology of dynamic movement tracking, status and composition of all types of trains on ŽSR network. Its basic role and strategy is to cover the overall operation of infrastructure and transport on the infrastructure with one compact IS. Data recording in PIS is the basis for deregistration of performance using the infrastructure, creating reports for distribution of electric traction energy for individual carriers, tracking and recording delays of all trains, data exchange between the railway operator and the carrier, creating statistical reports, creating reports for operational management, creation of documents necessary for determination of station performance. Entering information into the system requires that the accuracy and time limit be kept to avoid disruption to traffic. We divide this information into static, basic and extended sentences and dynamic information about train movement. Dynamic information about train movement is provided by ŽSR employees in the form of an additional sentence.
As the use of PIS is linked to other IS used in the conditions of the Infrastructure Manager, but also to IS of carriers and information systems of other European railways, it keeps links to all necessary external information systems.
The freight carrier ZSSK CARGO uses a follow-up ISP system, which represents a

comprehensive solution to the needs of ZSSK CARGO in the field of operational processes in domestic and international transport of goods. The technology architecture takes into account the latest IT trends. It uses on-line data processing through a web interface with implementation of security features against data misuse. The system is based on the J2EE architecture with a central data base and application logic located in the center, integrated with the SAP R / 3 economic system, also communicates with the infrastructure manager (ŽSR) information systems, business partners and the Hermes international network.

Train Dispatching System (VDS)
At present, most dispatchers in operational traffic management have a direct view of railway operation only within the scope of their own controlled station (traffic) and adjacent interstate sections. In the designated area of competence, operational traffic control is the responsibility of the traffic controller. The operation of the train traffic is monitored by the operational dispatcher through the train dispatching system information system (hereinafter referred to as VDS). Its role is to support the management and monitoring of train movements. Based on a graphical representation of the current train position and actual infrastructure constraints (closures), it enables network-wide train traffic management.
In addition to the dispatching system (VDS application), dispatchers who also organize traffic on remotely operated lines (through the graphic-technological extension of the signaling equipment) have a wider view, at the same time on several traffic and several interstation sections.
At present, one of the main goals of the Transport Department of ŽSR is the functionality of today's licensed Train Dispatching System, used primarily by the dispatching apparatus, to get into the future multi-license software system available to all employees involved in traffic management and delivery, ie. This is the main reason for the creation of the application "Train Track Location"

Train Track Location (TPV)
It is an application designed for the railway operator as a support of operational control of the transport process. The application graphically depicts train movements and closures in the selected track section and traffic points. It provides the employees of the station with an overview of the operational situation on selected lines. In the case of emergencies and closures, it allows for the operational correction of traffic decisions, thus ensuring the continuity of traffic even during lockout or otherwise restrictive activities at the lowest level of management.

TIS / Infrastructure Information System
It is a project whose aim is to gradually cover the needs of informatisation of specialized organizational units of ŽSR in relation to the information system of socio-economic information SAP R / 3 and other information systems of ŽSR.
The Infrastructure Information System solution is designed in a modular structure according to the professional focus of user workplaces and in each industry it consists of a database (DB) part and a graphical (GIS) part that describe:
a. technical parameters of the devices with numerical data and drawing technical documentation,
b. operational parameters, technical and project preparation of repairs and reconstructions,

c. planning and evaluation of repairs and maintenance with connection to SAP R / 3 system,
d. support for economic evaluation of rail infrastructure costs.

ISI currently covers the following tasks:
e. Provides central records of infrastructure objects of ŽSR, where each facility is registered in the system only once,
f. provides information about each registered infrastructure of ŽSR infrastructure,
g. enables simple and operative data updating (graphical support),
h. concentrates the drawing documentation into a digital database,
i. creates a central database of ŽDC infrastructure,
j. Provides users with on-line access to applications based on hierarchical permissions;
k. enables the creation of statistical and dynamic outputs;
l. provides maintenance diagrams, drawings, construction drawings;
m. Provides administrators with records, Excel outputs and dynamic outputs of their choice;
n. provides photo documentation of objects;
o. ensures publication of selected data on intranet and internet pages for the needs of ŽSR employees, carriers and other ŽSR clients;
p. ensures central management and use of codebooks;
r. ensures mutual communication of modules.

An important task of this information system is also to meet the EU requirements for the definition and provision of metadata, which arise from the EU directives for the interoperability of European transport systems and which require each Member State's transport infrastructure object to have a unique identifier. Because the ISI data is stored in a single relational database in the target form, the record identifiers of the individual objects provide this request.
ISI is divided into five basic modules:
s. Module Railways and Buildings,
t. Notification and security technology module,
u. Electrical Engineering module,
v. Digital technical documentation module
x. Operational Measures module

Figure 67 - PIS functionality

SAP R/3
The infrastructure manager, as well as other railway market players, need to know about all the factors that affect the company's business and economic activity. Based on advanced development technologies, SAP R / 3 enables comprehensive enterprise economy integration and data processing.
The SAP R / 3 economic information system contains data on external and internal resources and supplies the user with important up-to-date information that can be quickly analyzed. It keeps economic indicators in their time development, resp. serves as a warning system for changes in development when deviations from normal or planned status. Individual modules are used to accomplish these tasks.

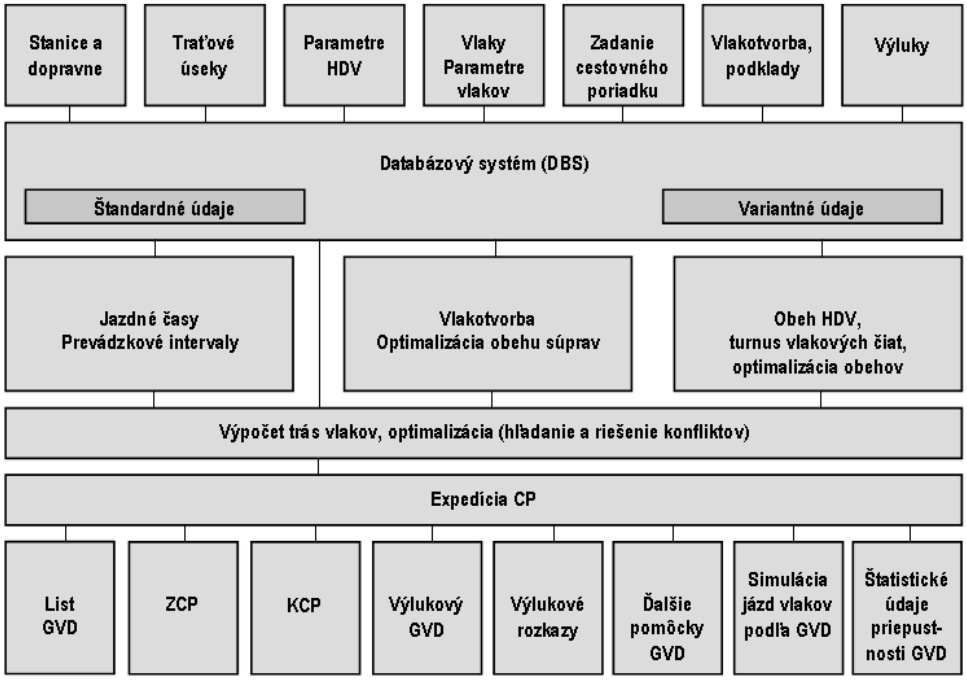
Electronic timetable 'ELIS'
ELIS is a train search engine on the timetable.

EDYN (ZONA-CP)
The main project at ŽSR supporting the set of train transport graphic design is the ZUTA Computing Technology ZONA CP VT. It covers the whole process of the timetable assembly, from the collection of documents, through the construction itself to the release of GVD aids. The benefits of the system in comparison with the manual design of the graphic board are mainly in the limitation of personal consultations of the GVD designers, refining the data links during the design, which after approval serve as data for further processing and minimizing administrative activities and especially speeding up the schedule.
The ZONA project first developed jointly with the SENA project used by Czech Railways, and. with. However, this system is open to other activities, such as the evaluation of the constructed GVD in terms of quantitative and qualitative indicators, the assessment of the permeability of railway lines and stations when changing infrastructure or the construction of new infrastructure.
Implementation is carried out in the form of decentralized data bases, which are distributed according to the territorial principle. Mutual communication is ensured through a single data transmission network (JSPD). The timetable system enables not only the construction of the train traffic graphics and the distribution of GVDs, but also the optimization of route guidance or conflict resolution both automatically and manually.
The timetable creation system can be divided into:

- standard - input and output data that have precise input, format and content required by the technological processes in transport,
- solvable in a variant - way of creating a timetable, optimization of train route management, software.

The ZONA CP VT system has established external links to the data bases of other information systems to enable the export of constructed timetable data based on the source data base of the system. In particular, these are information systems using train data, both the infrastructure manager of ŽSR - IS PIS (Operational Information System) and ZSSK CARGO - ISP (Operational Information System).

Figure 68 - Basic structure of ZONA CP VT system

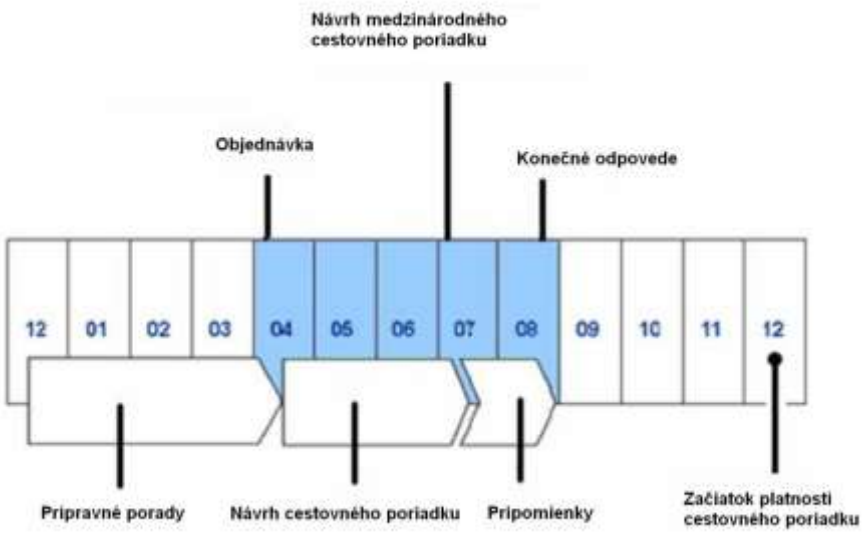


Input data editor serves for initial filling of data base of track and station descriptions. It allows to create, change and update the data base as standard (interconnection of rails, time to change, current routes, station tracks, speed profiles, direction and slope ratios, platforms, lights, crossings, positions of pantographs, speed gears etc.) and variable (operational parameters of traction and trailers). The filling of these data is a prerequisite for the full use of the ZONA timetable creation system.
The actual construction of the train transport graphic is carried out in data-enclosed units, which can be compared and backed up. Data can be imported or exported, archived. Alternative data include the composition of the train, its route or time elements of the graphic. In the ZONA-CP-VT system, travel times between transport points in transport sections are determined as fixed points.
GVD sheets, copybooks and book schedules are automatically created from the entered and prepared data. The final version of the program will be exported to files for printing in MS Office. The statistics are evaluated automatically according to the user's choice.
Systems for the allocation of train capacity in international traffic
RNE has also developed Internet support for its processes. Most notably, the Path Coordination System (PCS) is a web-based application that supports the process of requesting and coordinating routes. It ensures the conflict-free planning of the entire train path in the GVD and the coordination of routes by agreeing exact entry and exit times at border crossing points in both passenger and freight traffic. It is used by railway undertakings as an essential element of optimal coordination of European rail transport.
Charging Information System (CIS) is an application for indicative determination of infrastructure charges. Train Information System (TIS) is a web-based application that displays the travel of an interstate train from a starting station to a destination station. It serves to support the management of interstate train services by providing information on interstate passenger and freight trains on corridors.

Applications support train capacity management. Capacity management functions are:

- advising carriers on infrastructure capacity;
- Carrying out the best use of infrastructure capacity in interstate transport as well as optimizing national and international routes;
- assessment of the booked route as a carrier's request,
- planning of international transport capacity,
- partnership in the processing of short-term orders,
- transparent and non-discriminatory access to infrastructure capacity.

Figure 69 - Timetable for capacity allocation of the RNE - preparation of an interstate timetable



The procedure for applying for a train path consists of two main steps:

- Route study request;
- route booking.

The time sequence of the activities for the preparation of the international timetable is shown in the figure above, with the individual activities being given in the months before the planned timetable starts, in the model month marked X. 48 to X-12, is intended to define strategic requirements such as e.g. new infrastructure, high-speed trains, tactile graphics, etc. The aim is to profile capacity in the medium term.

7.13. Predictable driving times

The predictability of freight train journeys has a major impact on the transport economy and the price offer. The main 2 issues that need to be addressed are described below.

Problems at border crossing points

Within the SŽDC network in the Czech Republic, carriers can be informed in time about freight trains. International freight trains of the highest category Nex take precedence over passenger trains because they have to adhere to timetables vis-à-vis customers, otherwise they are penalized.

In the international freight transport, the PKP PLK (Railway Infrastructure Manager in Poland) is being created by the Czech side in relation to the transfer of information on the

actual location of trains arriving from Poland to the TSO in the Czech Republic - Petrovice u Karviné and Chalupki. transport in Přerov, carriers) big problems (described in chapter 7.11.), which result in train downtime at the railway station Petrovice u Karviné. Firstly, because of taking over trains coming from Poland by Czech carriers, ie the ideal situation is the arrival of freight trains from the Czech Republic and Poland at about the same time to the PPS Petrovice u Karviné, so that they can exchange traction vehicles and not wait until the train from the neighboring state arrives late. This is also linked to the harmonization of timetables for international trains. Another problem is that traction vehicles in each state are owned by both national carriers (ČD Cargo, as) and private carriers (eg AWT) and there is a problem that each carrier can pick up his train from a neighboring state at the border station. in the Czech Republic. There is apparently a lack of agreement between carriers that would allow the use of another carrier's propulsion vehicle, which arrives at the TSO at a given time, for a reasonable fee.
Problems at border crossing points are not primarily a problem of the network or legislation, but a problem of organizing the work of carriers. Carriers who do not change the locomotive at the border because they have an intermodal train pass smoothly.

Traffic exclusion problems
Although fixed routes are designed in the graphic, due to exclusions and accidents, ordered train routes of freight trains, even RFC corridor routes, are broken down. The carrier cannot assume what the journey time will be at the time the train is running. It is thus not possible to plan the turnover of wagons, locomotives and manpower. This complicates the pricing of the transport, because on longer routes within Central Europe there may be a delayed return even in a matter of days. The carrier must therefore have rererves that increase its costs and make the whole process more expensive. These costs are not compensated by the carriers in any way, even though they have not caused them. The Infrastructure Manager has no alternate routes if problems occur. These routes are not considered even when designing modifications to the rail network.

7.14. Summary of the Chapter 7

In the TRITIA region on the territory of the Czech Republic it is possible to ensure sufficient traffic flows by rail, because it is both Ostrava-Karviná industrial agglomeration with a larger number of large cities (Ostrava, Bohumin, Karviná, Orlová, Havířov, Český Těšín, Frýdek-Místek, Třinec, Opava , Studénka, etc.) and also in the Polish territory there are mines and smelters around the towns of Rybnik, ,or, Jastrzembie - Zdrój, Brzescie, Woli, Bytom, Piekary Ślanskie, Rudy Śląskie, Gliwic, Zabrze, Katowice, Myszłowice, Sosnowiec and Dambrowej Gó , Czechowice-Dziedice. In Slovakia, these are the agglomeration of Žilina and the industrial towns of Čadca, Bytča, Martin, Ružomberok, Liptovský Mikuláš and Dolný Kubín and the Orava region. Many sidings are connected to the railway stations, where sources of transport flows are created and which ensure the connection of production companies and other companies to the main lines.
All areas of the TRITIA region are confronted with bottlenecks in road transport. These are mainly traffic jams on motorways and expressways and lack of parking spaces for trucks and cars. Especially the motorway and road network in the Czech Republic lacks many such parking spaces. In addition, they also arise during road and bridge repairs when the passage profiles around the work areas are narrowed.

The railways are competitive in comparing costs with long-distance road transport and, in particular, in the transport of bulk substrates, heavy and bulky loads, as well as combined transport.
On the main corridors on both the SŽDC network and the PKP PLK and ŽSR network there are slippages in line speeds, insufficiently long tracks in stations for long freight trains of 740 m (in perspective) as well as shortcomings in the number of lines and their un-railing. As a result, their technical parameters and speeds are being gradually improved as part of track reconstructions, and at some stations, rails will be lengthened and parameters for freight and passenger transport will be improved.
In terms of removal of bottlenecks on routes to reloading points, some sections of lines on the RFC 5 and RFC9 corridors - lines 301D, 301G, 302A, 305B - were reconstructed on the SŽDC network. The reconstruction of the 301B Detmarovice - Petrovice u K line, Dětmarovice - Mosty u Jablunkova, Polom - Suchdol n. O., optimization and electrification of the Ostrava Kunčice-Frýdek Místek - Valašské Meziříčí line, equipment of the Mosty u Jablunkova - Dětmarovice line ECTS systems connection of the triangle connecting line 305B from Přerov in front of the Studénka station towards Mošnov, electrification and capacity increase of the Veřovice - Studénka line and modernization of the Ostrava junction.
The lines on the ŽSR network are also gradually upgrading the corridors. A project for the modernization of the Čadca state section is under preparation. Hranice - Krásno n. Kysucou including 25 kV AC equipment and reconstruction of the Čadca railway station. A limiting element in the Zwardoň (Skalité) cross-border station is the short track length (350 m) at Zwardoň railway station with respect to the prospective lengths of freight trains of 750 m. A problematic section on the ŽSR network may be the section Žilina - Vrútky, which connects the lines Žilina - Čadca and Žilina - Púchov and where tunnels limiting throughput are located. The reconstruction of the Žilina junction is planned and the lines around Žilina will be equipped with the ETCS system in the coming years.
PKP PLK lines in the TRITIA region following the PPS Zebrzydowice and Chałupki are mostly double-track electrified (lines 151 from Chałupek to Kędzierzyn Koźle or 93 from Zebrzydowice to Trzebinia), some are only single-track electrified (line 158 connecting to line 151 in Rudyszwald) also line 90 from Cieszyn to Zebrzydowice connecting line 93 and line 190 Bielsko Biała - Cieszyn. Lines 93 and 15 are not in good technical condition (there are speed drops) and require reconstruction and also the adjacent lines and especially lines around Katowice need to be reconstructed at higher speeds. Plans for their reconstruction are until 2023.
Despite the industrial agglomeration, including the Katowice, Gliwice, Bytom, Mysłowice and Jaworzno Szczakowa junctions, where many lines run, some of them are earmarked for freight (from lines 149,138, 137,141, 171, 161,132, 168) and others for passenger transport. Mainly to ensure overall throughput and higher speeds for passenger transport.
The international corridor E65 includes lines 1 and 139 in one branch and lines 131, 137 and 139 in the other branch. Gradual reconstruction of its individual sections is underway and project documentation for the remaining sections is being processed. Lines in the direction of the ports of Swinoujscie and Szczecin are also being reconstructed (some sections of line 273).
Corridor E30 includes lines 91, 132, 133, 136, 275, 278, 282. Within it, the lines are reconstructed mainly in relation to passenger transport and speed increase to 160 km / h. The reconstruction of the section Opole Zachodnie-Kędzierzyn-Koźle is to be completed in 2021. The modernization of the track in the section Jaworzno Szczakowa - Trzebinia and in the vicinity of the Jaworzno railway station is still ongoing and will be completed in 2020.

Siding connections - siding on the SŽDC network in the TRITIA region are mostly connected to two-track electrified lines of the TEN-T network, but for example the siding of the KD terminal in Paskov will still need to improve connection conditions in the future. The 302A line is planned to carry out electrification in the Ostrava-Kunčice - Frýdek-Místek section and double-track in the Vratimov - Frýdek-Místek section. Another disadvantage is the siding of Hyundai Motor Manufacturing Czech, s.r.o., connected at the Dobrá railway station to the single-track non-electrified line 302B Český Těšín - Frýdek-Místek. For the time being, it is not included in the list of constructions to be implemented in the perspective of 2030.
Also on the PKP PLK network in the TRITIA region, most sidings of large industrial enterprises (mines, smelters, power plants and heating plants and manufacturing companies) are connected to double-track electrified lines. Only a smaller number of sidings are connected to monorail sections of tracks. Also the logistics park Autoterminal Ślansk Logistic Sp. z.o.o. Ślansk is connected to line 62 at Dambrów Górnicza railway station, Strzemieszyce, where one section is double-track electrified and the other section only monorail (in the direction of Sosnowiec Glówny). Auto-terminal is used to transport finished cars from VW Poznan and other car manufacturers (Volvo, etc.).
There are sidings of KIA Motors Slovakia, s.r.o., heating plant and KD terminal (TIP Žilina, s.r.o.) etc. connected to the ŽSR network at the Žilina - Teplička railway station. In Vrútky railway siding VOLKSWAGEN SLOVAKIA, a.s. and other sidings of enterprises with different production orientations. Other sidings are connected to stations on the electrified line 118A Zvolen - Vrútky (in the section Vrútky - Horná Štubňa double-track and then single-track) running through many tunnels. And also by different power supply - in the Martin - Vrútky section by a 3 kV unidirectional system and in the Zvolen - Banská Bystrica section by an alternating system of 25 kV, 50 Hz).
Only sidings connected to stations on single-track non-electrified lines 181 Kraľovany - Trstená and 126 Žilina - Rajec are disadvantageous. Wood, building materials, etc. are transported from Orava and many other stations on the ŽSR network.
The key routes are the international freight corridors RFC 5, RFC 9 and TEN-T lines. Nodal points are places where container terminals and sidings with a large volume of goods transport by rail are connected. The combined transport terminals on the SŽ network as well as on the PKP PLK and ŽSR network are situated on the main railway lines, which are mostly double-track and electrified. Only the terminal in Glivice is connected to the port by a short single-track line, which is further connected to double-track electrified lines. The KD terminal in Gliwice Sośnica (PKP Cargo Connect) is connected to line 141, which runs through the undermined area and therefore there are low speeds.
Žst. Rybnik Towarowy, where the future container terminal will be connected, lies on line No. 158 from PPS Bohumín-Chałupki, which is however monorailed in the section from PPS Chałupki, which reduces its throughput in the direction to the Czech Republic. Obviously, as needed with respect to the load on the surrounding lines, PKP PLK will decide in the future whether or not this section will double-track.
The terminals in Zilina are connected to the TEN-T and RFC 5 and RFC 9 networks.
It is necessary to unify the regulations of SŽDC and PKP PLK regarding ordering of ad hoc routes of freight trains, shortening of waiting time after departure on allocation of ad hoc route on PKP PLK network, lifetime of routes, unification of international train numbering for their whole route (applies to PKP PLK), unification of route charges (ordered and realized) on the PKP PLK network (calculate the charge only once regardless of the number of days it falls). In cooperation with carriers to ensure better cooperation of partner

transport companies between the Czech Republic and Poland and between Slovakia and Poland regarding timely provision of locomotives for sheds and, where appropriate, drivers.

On the PKP PLK side, to speed up international freight transport, it is essential to introduce a modern information management system that will enable the transfer of train position information on the PKP PLK network to the Czech IS - the Traffic Control Center in Přerov and vice versa. It will also allow carriers to enter their data in it. In addition, it will allow dispatchers in Zebzrydowice and Chałupka to have sufficient information about the composition of trains that will arrive at the PPS well in advance, rather than having to manually enter it into the computer from documents received by the driver only after the train enters the cross-border station.

Cross-border transport of international freight trains between SŽ and ŽSR network is better in terms of mutual cooperation than with Poland. The level of ŽSR information systems is similar to that of SŽ and trains run on trust. This is due, among other things, to historical development, when in the period 1918-1993 the Czech Republic and Slovakia were one common state. Nevertheless, there are big delays of trains running between Slovakia and the Czech Republic via the Mosty u Jablunkova / Cadca cross-border station.

On the basis of Chapter 7 it can be stated that the elimination of unnecessary train downtime at the border and in closures will be crucial for increasing the share of rail transport, as time savings of up to 50% can be achieved on routes over 300 km. compete with road transport.

8. LEGISLATIVE CONDITIONS

8.1. Subsidy policy

8.1.1. Czech republic

The state subsidy policy supports, in connection with rail transport, investment measures (concerning infrastructure, vehicles, transport units, etc.), but also non-investment (tax discounts, discounted prices for railways in payments for transport routes, collection and delivery of shipments from the terminal) KD, etc.). In addition to rail transport, in previous years it was also invested in water transport infrastructure - ports and ships.
Investment support
The investment measures relate to infrastructure, ie reconstruction and modernization of iron. railroads, rebuilding of railway junctions, siding and modernization of sidings, modernization and construction of KD transshipment points, but also other measures related to vehicles - equipment of vehicles with ECTS systems, conversion of electric traction vehicles to operation and AC 25 kV / 50 Hz system.
After the Czech Republic's accession to the EU, it became a strategic documentary in relation to drawing subsidies from EU funds, the Operational Program Transport (OP Transport) for individual periods 2005-2007, 2007-2013, when a larger share of funds is drawn from EU funds and a smaller share of the state budget of the Czech Republic.

Operational programme Transport 2014 -2020
Under this program, funds were allocated as follows:
Priority Axis 1 Infrastructure for Rail and Other Sustainable Transport - Cohesion Fund, 51.18% of the total allocation, ie approximately EUR 2.33 billion = approximately CZK 63 billion. It includes investments in rail infrastructure, multimodal freight transport (terminals), infrastructure of urban and suburban rail systems, rail transport fleet and freight water transport.
Priority Axis 2 Road infrastructure on the TEN-T network, public infrastructure for clean mobility and road management (Cohesion Fund, 27.49% of the total allocation, ie approx. EUR 1.25 billion = approx. CZK 33.84 billion). This includes investments in the construction and modernization of motorways and expressways on the TEN-T network, the deployment of ITS on roads and urban road traffic, and the development of a network of alternative energy supply stations on the road network.
Priority Axis 3 Road infrastructure outside the TEN-T network (European Regional Development Fund, 19.79% of the total allocation, ie approx. EUR 902 million = approx. CZK 24.36 billion), intended for investments in the construction and modernization of roads outside the TEN-T network.
Priority Axis 4 Technical Assistance (Cohesion Fund, 1.54% of the total allocation, ie approx. EUR 70 million = approx. 1.90 billion).

Support of container transport
Within the specific objective of SC 1.3. and the Program for Modernization and Construction of Combined Transit Stations were announced in 2016 and 2017. In July 2019, another call for applications for MoT under this program was announced. Applicants could submit applications from 7 to 14 August 2019, the deadline for accepting

applications was set on 23 October 2019. The beneficiaries are owners or operators of combined transport terminals. A total of CZK 800 million (EU contribution from the Cohesion Fund) is available under this call. Applicants may receive support of up to 49% of the eligible project costs.
The main activities supported under this call are:
Transit combined transport with public access - modernization and construction (inter alia trimodal road-rail-water, bimodal road-rail).

- connection of terminals to transport infrastructure of rail, road, water and air transport
- construction and modernization of terminals and equipment mechanisms
- ITS deployment including door-to-door mobility support
- construction of accompanying infrastructure of the public terminal
- Promotion of new transhipment technologies and means of transport related to the technology concerned

Until 2019, 7 projects related to transshipment points were supported. The total approved support amounted to CZK 487.936 million. 13 applications were submitted, which corresponds to 54% success rate of the submitted projects.
Within the framework of this program, a project for the construction of a container terminal in Ostrava - Mošnov with public access with the deadline of 1.8.2019 - 1.1.2022 was approved in the TRITIA region. Total project costs CZK 767,543,442.92, Approved contribution from EU funds: CZK 276,833,197.90 (ie 36.06%).
In relation to this terminal and the TRITIA region, subsidies were approved for the project Purchase and renewal of semi-trailers for combined transport of the company ČSAD LOGISTIK Ostrava a.s. with the realization date 30.4.2019 - 31.5.2020, the total project costs 30 426 176,00 CZK, contribution from EU funds 7 543 680,00 CZK (24,79%). It was the purchase of 20 pieces of semi-trailers mega (lowdeck) and 10 pieces of standard semi-trailers for combined transport.

Acquisition of combined transport units
In 2019, two calls were announced. One started on 31 January 2019 and ended at the end of May 2019. In the first call, 2 projects were supported, amounting to CZK 10.574 million. Another call was announced on September 27, 2019 and applications will be accepted from October 25, 2019 to January 10, 2020.
EU aid amounts to a maximum of 30% of eligible expenditure. Applicants must have available funds in the amount of min. 70% of the eligible expenditure. The total eligible costs of the project must be less than CZK 50 million.
Beneficiaries - owners or operators of transport units, companies with registered office or organizational unit in the Czech Republic. They must be entrepreneurs in obl. freight forwarding, and have the necessary operations (for trade) and concessions, permits.
Supported are initial investment / purchase of new transport units for continental combined transport, vertically manipulated (intermodal) semi-trailers, inland containers (but not ISO sea containers), swap bodies, special transport units including new technologies for continental KD.
Applications are assessed by indicators - number of purchased transport units, number of transports performed by supported transport units, transported volume in combined transport.
Conditions of using the subject of support - what is included in the project indicators:
use of acquired units on KD lines that start or end in the territory of the Czech Republic or demonstrably transit through the territory of the Czech Republic

taking into account even unforeseen events - possibility to adjust the set indicator
it is a combined transport of road - rail or water
the condition is an increase in the volume of transport in KD realized by the acquired units
In the first call, 2 projects were supported, amounting to CZK 10.574 million. Another call was announced September 27, 2019 and the receipt of applications in the period 10/2019 -1/2020.

Siding Support and Revitalization Program (OP Transport 2007 -2013)
In previous years under OP Transport 2007 -2013, priority axes 6.1. investment in the extension and further development of existing railway sidings and the establishment of new railway sidings, or investment in the acquisition of railway sidings, which would have ceased to exist or would have ceased if it had not been purchased. It was also possible to pay the costs associated with the lease of property other than land and buildings if the lease was concluded in the form of a finance lease.
The regions benefited from the form of national regional investment aid, where the maximum amount of eligible expenditure could reach the Moravian-Silesian region - max. 40%.
Beneficiaries of both construction and non-construction investment support had to comply with the legal relationship to land to be built or built-up siding. The siding had to be located in the Czech Republic and in a region eligible for regional investment aid.
The first call was announced in 2008, it was possible to draw up to 430 million CZK. However, due to low interest, the Ministry of Transport (MD) transferred part of the funds to other programs.
The second call was opened in the period from 15 October 2010 to 31 January 2011. Up to CZK 224.5 million of the total grant (ie CZK 190.8 million from the ERDF and CZK 33.7 million from the state budget). At the same time, the Ministry decided to simplify the rules, as only CZK 32 million was spent in the first round. According to the Ministry of Transport, this was well below expectations.
Under the third call, applications could be submitted from 29 October 2012 to 18 January 2013. A total subsidy of CZK 110.136 million (of which CZK 93.615 million from the ERDF and CZK 16.521 million from the state budget) was available. .
A total of 5 projects were supported concerning the development of 4 KD transhipment points. The total amount of support was CZK 95.978 million.
In our region in 2008 this program financed the purchase of container handling equipment (readstacker) for KT terminal AWT.

Call No 64 - Ensuring rail interoperability - Implementation of the rolling stock subsystem - locomotives and rolling stock - enabling operation on the 25 kV / 50 Hz system, within which the support of freight locomotives. Call 64 was completed in May 2019, the projects accepted are in the process of approval.
The EU contribution shall not exceed 50% of the eligible expenditure. 50% of the eligible expenditure. The Cohesion Fund will cover state aid up to 100%. The beneficiaries of the aid are licensed railway undertakings which own or operate rolling stock and owners of non-railway rolling stock.
Indicators for the selection of applications are - number of newly acquired or upgraded rail transport vehicles, Proportion of vehicles equipped to operate on the 25 kV / 50 Hz supply system of the total fleet of carrier / owner electric traction vehicles.

Within SC 1.5 OPD - Interoperability in Railway Transport - **call 76 - system for measuring energy consumption (carriers)** was announced
The challenge concerns equipping railway traction vehicles with a system for measuring electricity consumption - purchasing a metering device and securing the ground part of the metering system.
Indicators for the selection of applications are - number of newly acquired or upgraded railway vehicles, the share of vehicles equipped with equipment for measuring traction energy consumption from the total number of electric traction vehicles.
The EU contribution amounts to a maximum of 85% of the eligible costs; 15% of the eligible expenditure. The total eligible expenditure of the project must be lower than the threshold of the so-called major project, ie EUR 75 million (according to Article 100 of the EU Regulation No. 1303/2013).
It is expected that new calls will be announced - applications received in the period 10/2019 - 1/2020 and 4/2020 - 6/2020. The allocation for this call will be CZK 40 million. It will be directly linked to calls 15 and 45, which are focused on the same activities.

Support in Telematics systems
Telematics in freight transport is addressed by Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the subsystem Telematic Applications for Freight. The Ministry of Transport is interested in supporting the implementation of telematics applications in freight transport within the framework of Ensuring Interoperability in Rail Transport - Telematics Applications in Freight and Passenger Transport (TSI-TAF and TSI-TAP) - SŽDC. Call No.44 was announced in December 2017 and from 20.12.2017 it was possible to submit applications, the deadline for accepting applications is half of 2021. The call is continuous and intended exclusively for SŽDC.
The EU contribution amounts to a maximum of 85% of the eligible costs; 15% of the eligible expenditure. In the case of the applicant SŽDC, s.o. The Cohesion Fund will cover 85% of the state aid, the remaining part of the aid will be covered by public resources from the SFTI budget. The total eligible expenditure of the project must be lower than the threshold of the so-called major project, ie EUR 75 million (according to Article 100 of the EU Regulation No. 1303/2013).
Indicators for the selection of applications are - number of newly acquired or innovated information systems in accordance with TSI TAF and TSI TAP, number of journeys made using newly acquired or innovated systems in transport.

Support for equipping railway vehicles
Within SC 1.5 OPD - interoperability in rail transport - equipping of ETCS and GSM-R units Call No.43 was launched on 7.12.2017 (applications could be submitted from 20.12.2017) and terminated on 11.5.2018. The second round of calls for autumn 2019 is under preparation. The EU contribution is up to 50% of the eligible expenditure for equipping vehicles with GSM-R units and up to 85% of the eligible expenditure for equipping vehicles with ETCS on-board units. The maximum amount of support for the on-board ETCS unit of one vehicle is CZK 6,750,000. Applicants must have available funds in the amount of min. 50% (15% of the eligible expenditure). The total eligible expenditure of the project must be lower than the threshold of the so-called major project, ie EUR 75 million (according to Article 100 of the EU Regulation No. 1303/2013).
In the case of the applicant SŽDC, s.o. the Cohesion Fund will cover 50% / 85% of the state aid, the remaining part of the aid was covered by public resources from the SFTI

budget. For other applicants, the Cohesion Fund will cover up to 100% of the public support.
The beneficiaries (applicants) are licensed railway undertakings that own or operate rolling stock and owners of non-railway rolling stock and also SŽDC, s.o.
Targeting of support (activity) - equipping of railway vehicles with ETCS and GSMR on-board units or upgrading (upgrading) of ETCS on-board units already installed on vehicles to newer version according to technical requirements of the infrastructure manager for respective lines.
Indicators for the selection of applications are - number of newly acquired or upgraded railway vehicles, share of vehicles equipped with ETCS / GSMR units in the carrier / owner's fleet.

Within SC 1.5 of OPT for ensuring interoperability in railway transport and equipping railway vehicles, c**all No.46 - replacement of brake blocks for freight wagons** in the period 14.12.2017 - 20.4.2018 was announced.
The EU contribution amounts to a maximum of 50% of the eligible costs; the maximum amount of aid per disguise per vehicle is CZK 12,000. the applicant must have available funds in the amount of min. 50% of the eligible expenditure.
The total eligible costs of the project must be lower than the threshold of the so-called major project according to Article 100 of the EU Regulation No. 1303/2013 (ie EUR 75 million). There is no minimum eligible expenditure.
The beneficiaries (applicants) are licensed railway freight undertakings which own or operate rolling stock and owners of non-railway rolling stock.
Aim of the support (activity) - disguise of brake blocks of freight wagons in accordance with noise limits according to valid technical specifications of TSI NOI and TSI WAG.
The indicators for the selection of applications are the number of newly acquired or upgraded railway vehicles and the share of freight wagons meeting the noise limits of the total number of freight wagons / owner wagons.

Call No 64 - Ensuring rail interoperability - Implementation of the rolling stock subsystem - locomotives and rolling stock - **enabling operation on the 25 kV / 50 Hz system, within which the support of freight locomotives**. Call 64 was completed in May 2019, the projects accepted are in the process of approval.
The EU contribution shall not exceed 50% of the eligible expenditure. 50% of the eligible expenditure. The Cohesion Fund will cover state aid up to 100%. The beneficiaries of the aid are licensed railway undertakings which own or operate rolling stock and owners of non-railway rolling stock.
Indicators for the selection of applications are - number of newly acquired or upgraded rail transport vehicles, Proportion of vehicles equipped to operate on the 25 kV / 50 Hz supply system of the total fleet of carrier / owner electric traction vehicles.

Within SC 1.5 OPD - Interoperability in Railway Transport - **call 76 - system for measuring energy consumption (carriers)** was announced.
The challenge concerns equipping railway traction vehicles with a system for measuring electricity consumption - purchasing a metering device and securing the ground part of the metering system.
Indicators for the selection of applications are - number of newly acquired or upgraded railway vehicles, the share of vehicles equipped with equipment for measuring traction energy consumption from the total number of electric traction vehicles.

The EU contribution amounts to a maximum of 85% of the eligible costs; 15% of the eligible expenditure. The total eligible expenditure of the project must be lower than the threshold of the so-called major project, ie EUR 75 million (according to Article 100 of the EU Regulation No. 1303/2013).
It is expected that new calls will be announced - applications received in the period 10/2019 - 1/2020 and 29.1.2020 - 15.5.2020. The allocation for this call will be CZK 40 million. It will be directly linked to calls 45 (20/12/2017 - 03/04/2018) and 15 (7/20/2020 to 5/15/2020), which are focused on the same activities.

Support in Telematics systems
Telematics in freight transport is addressed by Commission Regulation (EU) No 1305/2014 of 11 December 2014 on the technical specification for interoperability relating to the subsystem Telematic Applications for Freight. The Ministry of Transport is interested in supporting the implementation of telematics applications in freight transport within the framework of Ensuring Interoperability in Rail Transport - Telematics Applications in Freight and Passenger Transport (TSI-TAF and TSI-TAP) - SŽDC. Call No.14
It was announced in December 2017 and ended on 7.3.2018. This call was addressed to licensed railway undertakings which own or operate rolling stock.
The EU contribution was max. 50% of the eligible expenditure; the applicant had to have min. 50% of the eligible expenditure. The total eligible costs of the project must be lower than the threshold of the so-called major project according to Article 100 of the EU Regulation No. 1303/2013 (ie EUR 75 million).
Description of supported activities - implementation and updating of telematic applications in freight and passenger transport in accordance with the applicable technical specifications for interoperability (TSI TAF, TSI TAP).
The indicators for the selection of applications were the number of newly acquired or innovated IS in accordance with TSI TAF and TSI TAP, the number of trips made using newly acquired or innovated systems in transport.

Call No.44 was announced in December 2017 and from December 20, 2017 it was possible to submit applications, the deadline for receiving applications is June 30, 2021. The call is continuous and intended exclusively for SŽ.
The EU contribution amounts to a maximum of 85% of the eligible costs; 15% of the eligible expenditure. In the case of the applicant SŽ, s.o. The Cohesion Fund will cover 85% of the state aid, the remaining part of the aid will be covered by public resources from the SFTI budget. The total eligible expenditure of the project must be lower than the threshold of the so-called major project, ie EUR 75 million (according to Article 100 of the EU Regulation No. 1303/2013).
Indicators for the selection of applications are - number of newly acquired or innovated information systems in accordance with TSI TAF and TSI TAP, number of trips made using newly acquired or innovated systems in transport.

Water transport - support for the construction and modernization of freight ports
It is planned to launch new calls under SC 1.3 of the OPT - construction and modernization of public ports for freight transport. Acceptance of applications for the first call (for small ports - for projects up to CZK 2 million) is expected in 9/2019, the end of receipt 12/2019. And another call (for projects over CZK 2 million) is planned for the period 12/2019 - 02/2020.
Supported will be:

- Access roads to the port for road trucks
- Port railway infrastructure
- Construction and reconstruction of utilities in the port building
- Modernization of the service center for vessels and railway vehicles
- Adjusting the port shore for the ship's position
- Dredging from the bottom of the access road to and within the port area

NON-INVESTMENT SUPPORT

Conteiner transport support - road tax relief

For the purposes of this Act, combined transport means the transport of goods in one and the same transport unit (in a large container, swap body, rolling container) or in a lorry, trailer, semi-trailer with or without tractor, using rail or inland waterway transport if the section by rail or inland waterway exceeds 100 kilometers as the crow flies, and if its initial or final section is constituted by road

• between the place of loading or unloading of goods and the nearest railway station suitable for the transhipment or reloading of the combined transport, or

• between the place of loading or unloading of goods and the inland port, if it does not exceed 150 kilometers as the crow flies.

For a vehicle used exclusively for transport in the initial or final section of a container transport, the tax credit is 100%.

For vehicles that take place in combined transport in the tax period:

- more than 120 trips, 90% tax reduction,
- from 91 to 120 trips, the discount is 75% of the tax,
- from 61 to 90 trips, the discount is 50% of the tax,
- From 31 to 60 trips, the discount is 25% of the tax.

If the distance traveled within the territory of the Czech Republic is longer than 250 kilometers, such a journey is counted as two trips for the purposes of tax credit. Entitlement to the tax credit is proved by transport documents with confirmed data of the KD transhipment station, eventually loading and unloading railway station suitable for transhipment or inland port. The taxpayer will apply the tax credit to the locally competent tax administrator.

Price for transport route – container transport advantage

The calculation of the price for the transport route is given in the Statement on the Track of the National and Regional Railway Infrastructure Administration. The price is calculated as the sum of the items - the price for the transport route and the price for using the track. The price for the use of a single sub-train ride is the product of six items (sub-train ride length, price per kilometer, track category coefficient, product factor, track wear coefficient, ETCS traction unit equipment). The product factor is used to support a certain segment of the market using state budget co-financing. For the combined transport is determined product factor - P4 = 0.88, product factor P3 = 0.30 is advantageous rate of freight. transport within the collection and distribution system of single wagon consignments. Other product factors are designed for P2 non-specific freight and freight. transport - non-standard P5 trains.

A new container transport directive should be adopted - new rules on international container transport should apply to operations carried out between EU countries or

between EU countries and a third country, but it is not clear at what time (the proposal was discussed in December 2018 but not adopted). It maintains the scope of the current 1992 Directive, but there are limited (with conditions) operations that are partially implemented in third countries. They should provide additional flexibility as regards the length of the road section in order to allow the nearest suitable transhipment terminal to be reached. It will also clarify the document requirements for container transport operations and extend economic support measures (investment in transhipment terminals). Member States could decide on certain restrictions on cabotage in their territory, including a maximum time limit of 5 days for the permanent presence of vehicles on their territory in order to prevent abuse of cabotage by providing unlimited services. It is important for Czech road hauliers to continue to be able to transport their own transport units from foreign terminals and not have to order these services due to illegal cabotage from local carriers. This would significantly increase the transport costs of the entire road-rail-road chain. The proposal for a new directive failed to include the inclusion of national combined transport.

Road Price - ETCS Vehicle Equipment (Discounts)
The National and Regional Railways Statement also provides information on granting a discount on the use of infrastructure for ETCS on-board vehicles (in accordance with Directive 2012/34 / EU of the European Parliament and of the Council) to provide owners of traction vehicles with ETCS equipment further support from the state budget. Specific Factor S2 Values - Unfitted Traction Vehicle 1.00, Equipped Traction Vehicle 0.95. A more favorable value is assigned to each train in which there is at least one active traction unit with ETCS Level 2 or higher and does not change with the number of vehicles so equipped.

Other possibilities of drawing subsidies from EU funds.

CEF (The Connecting Europe Facility) Multimodal logistic platform
It is a financing instrument that supports investment in relation to transport infrastructure in Europe.
Multimodal logistics platforms include seaports, inland ports, airports and rail and road terminals for the transhipment of cargo between two or more modes of transport. They contribute to optimizing the performance of multimodal logistics chains and shifting freight from road to other more sustainable modes. Only freight terminals such as major seaports, main inland ports, major airports or major rail and road terminals listed in Part 2 of Annex II to Regulation (EU) No 1315/2013 may be financed.
In support of the general objectives of multimodal logistics platforms, the following measures shall be supported:

- interconnection with existing freight terminals, including access infrastructure and 'last mile' connections, which contribute to efficient interconnection and integration of these terminals into the core network,
- connections between existing freight terminals and other modes of transport, in particular rail, inland waterway and short sea shipping
- further development of existing freight terminals through small-scale auxiliary infrastructure (eg connecting or sidings, energy connections, rail adaptation for 740 m train length, etc.).

- ICT equipment and applications for providing or improving information flows within the terminal and along the logistics chain.

Buildings, warehousing and storage facilities, cranes, locomotives, etc. are not supported.
This financial instrument allows to draw subsidies from EU funds in advance. before the investment.
AWT drew a subsidy of 66% from CEF in 2016 in total eligible costs for the third stage of the KD terminal in Paskov (construction of two new tracks (each 350 meters long), parking space for 40 trucks, connection for cooling containers and a special place for containers with dangerous goods, construction of a new control center for dispatching).

8.1.2. Poland

INVESTMENT SUPPORT

Poland is the largest beneficiary of EU assistance. In the years 2014–2020, the European Union allocated EUR 82.5 billion to our country from the EU's cohesion policy.

Table 96 - The distribution of EU funds into national programs

Program	The size of support
Infrastructure and Environment Program	27,41 billion euro
Intelligent Development Program	8,61 billion euro
Digital Poland Program	2,17 billion euro
Knowledge Education Development Program	4,69 billion euro
Eastern Poland Program	2 billion euro
Technical Assistance Program	700,12 million euro

As part of regional operational programs for the Śląskie Voivodeship, 3 476 937 134 EUR was established, while for Opolskie voivodeship 944 967 792 EUR.
The most important transport support programs include:
1. Operational Program Infrastructure and Environment (OPI & E)
2. Eastern Poland Operational Program (not discussed due to the scope of the project)
3. Connecting Europe Facility - CEF
4. Regional Operational Programs 2014-2020
5. Integrated Territorial Investments - not discussed due to the fact that in relation to transport priorities they concern the development of road infrastructure and public transport.
6. European Territorial Cooperation and European Neighborhood Instrument Programs - not discussed further due to the lack of implemented projects in the field of freight and rail transport for the TRITIA area.
7. Horizon 2020 - relates to scientific research of an international nature, including in the field of transport, but not further discussed due to its nature and specificity.
8. The European Fund for Strategic Investments under the Investment Plan for Europe - the so-called Juncker Plan (repayable instrument)

There is a National Railway Program until 2023 (NCP) in Poland, which is a multi-annual program covering investments on railway lines, which are co-financed by the minister competent for transport. This document implements the strategies adopted by the Council of Ministers, including "National Development Strategy 2020" and "Transport Development Strategy until 2020 with a perspective up to 2030". The National Railway Program is valid until 2023, i.e. until the option of financing projects under the European Union's financial perspective for 2014-2020 ends. The document defines the amount and sources of

financing (including EU funds and national funds), and also provides the basis for ensuring investment financing in accordance with the Public Finance Act.

Operational Program Infrastructure and Environment 2014-2020
Under the Operational Program Infrastructure and Environment 2014-2020, priority rail V Development of rail transport in Poland is important for rail transport.
Objective: The objectives of the priority axis are to strengthen the role of rail transport in the integrated transport system of the country by improving the condition of rail connections in the TEN-T and outside the network, including rail infrastructure connecting major Polish cities, important industrial and economic centers and lines connecting sea ports with hinterland economic inland and greater use of rail systems in cities.
Funds: EUR 5 009 700 000
Actions:

a) Development of the TEN-T rail network (EUR 3 569 307 480)
   The investments will generally include the modernization and rehabilitation of existing rail routes in the TEN-T network and the scope of interventions) for passenger and freight transport, ensuring full compliance of the activities carried out with the technical parameters required for the railway infrastructure. Construction of line sections is also planned. Rail infrastructure investments will also be directed at improving the accessibility of airports. Railway projects selected for co-financing, depending on technical and implementation conditions, will have a component related to the implementation of the ERTMS system. As part of the modernization of rail routes, a higher priority than before will be placed on lines largely used for the carriage of goods, on which technical parameters (including in particular speed, allowable axle load and train length) do not meet the needs of modern carriers - primarily focused on the needs of those segments of the transport market in which rail transport can play an important role in the medium and long term. The purpose of the investment will be to alleviate the above problems by working to eliminate "bottlenecks" - places with limited capacity, obtaining fixed speeds over long sections (including, for example, eliminating point speed restrictions), enabling trains with a length of 740 m for the core network and raising the permissible axle load to the required values for a given line category. The intervention will focus primarily on implementation priorities related to the separation of agglomeration, long-distance and freight passenger traffic; making the routes easier to pass through or avoid agglomerations; adaptation of station track systems to anticipated transport needs; construction of second tracks on single-track routes and development of modern rail traffic control devices. In addition, other works related to comprehensive support for the railway system (multi-location) will also be implemented. They will include the construction and modernization of traction power supply systems, investments in the infrastructure of systems improving the management of passenger and freight transport, and improvement of the technical condition of engineering facilities. The implementation of the European Rail Traffic Management System (ERTMS) on key rail lines will be continued, including the implementation of GSM-R, as well as projects for the elimination of dangerous

places (including improvement of road crossings). An important supplement to investments on railway lines will be investments aimed at modernizing (purchasing or modernizing) rolling stock. The co-financed rolling stock will be used in the area indicated in the application documentation. Investments will be continued regarding the modernization of the infrastructure of railway stations and stops as well as the infrastructure of passenger service (including adaptation to technical requirements related to the service of people with reduced mobility, as defined in the EC Decision on TSI 257 PRM), consisting in the improvement of infrastructure elements and installation of systems to improve the quality of services provided, such as dynamic passenger information systems, ticket purchase, luggage storage, systems for integration with other modes of transport and achieving multimodality, etc. The investments will not include renovation works and will not apply to ongoing infrastructure maintenance.

Recruitment results: as part of competition No. POIiŚ.5.1 / 1/16 for this action, the call for proposals covered the period from November 30, 2016 to May 31, 2017. As part of the competition, 2 projects submitted by PKP Intercity were selected: Railway for good connections - modernization of wagons and locomotives for PKP Intercity S.A. and We are accelerating comfortably - modernization of wagons and purchase of locomotives for PKP Intercity S.A for the total amount of PLN 1,943,388,867.50, of which the co-financing granted is PLN 653,730,052.05. As part of the non-competition mode, 32 projects were identified for the total estimated amount of support PLN 23 112, 69 million. Due to the TRITIA area, the most important of them are: Works on the C-E 65 railway line, section Chorzów Batory - Tarnowskie Góry - Karsznice - Inowrocław - Bydgoszcz - Maksymilianowo (PLN 767.13 million); Works on the railway line No. 93 on the section Trzebinia - Oświęcim - Czechowice Dziedzice (PLN 425.75 million); Construction of ERTMS / GSM-R system infrastructure on PKP Polskie Linie Kolejowe S.A. railway lines as part of NPW ERTMS (PLN 1,358.50 million). As at December 10, 2019, 24 projects were selected with a total funding of PLN 10,892.98 million.

b) Development of rail transport outside TEN-T (EUR 1 440 392 520)
Under the investment priority, co-financing will receive 2. Description of the measure (including the purpose of the measure / sub-measure rail projects outside TEN-T and rail systems in cities and the scope of intervention) (city railways). Support for rail transport outside the TEN-T network will concern connections to the TEN-T network (the so-called feeder lines), sections connecting important industrial and economic centers, as well as lines forming part of access to airports and connections of sea ports with economic facilities in the interior of the country and connections of multimodal platforms. In addition to the TEN-T network, other types of railway investments will also be implemented, as indicated in the description of Measure 5.1. The type of work carried out (modernization, 269 rehabilitation, construction of new infrastructure) will depend on the specifics of the section, its

condition and technical parameters, as well as the role and importance in the regional and urban transport system. The purchase of specialized technical equipment for servicing the entire railway network is also planned. Actions will also be implemented to support the work of rescue services (technical rescue), consisting in the creation of central systems for monitoring railway traffic safety and organization of social campaigns aimed at increasing public awareness of avoiding hazards occurring while operating railway traffic. Due to the importance of passenger rail transport in the area of gravity of metropolises (considered promising), infrastructure investments will be implemented in the development of the urban rail system in these areas. The investment is envisaged for both line infrastructure (including traffic control systems) and point infrastructure (e.g. railway stops, stations) and rolling stock (including technical facilities). The co-financed rolling stock will be used in the area indicated in the application documentation. The investments will not include renovation works and they will not concern the ongoing infrastructure maintenance.

Recruitment results: as part of competition no. POIiŚ.5.2 / 2/16 for this action, the call for proposals covered the period from 30/12/2016 to 28/07/2017.
Seven projects were submitted as part of the competition, of which one was evaluated negatively. The value of projects that have passed the positive assessment is PLN 1 924 061 268.44, while the co-financing obtained is PLN 1 319 945 403.99. One of these projects concerned the area of the province. of Silesia - Revitalization and reconstruction of the partially closed railway line No. 182 Tarnowskie Góry - Zawiercie (co-financing: 503 132 631.78 PLN).
In the framework of the next competition no.POIiŚ.5.2/1/18 in the period from 31/07/2018 to 09/11/2018, 2 projects were selected with a grant value of 165 248 444.56, they were:Increasing the availability of regional rail transport in the Pomeranian Voivodeship through its integration with local transport - building an electronic platform for integrated mobility services and Modernizing the WKD railway infrastructure - by building the second track of railway line No. 47 from Podkowa Leśna to Grodzisk Mazowiecki.
Under the non-competition mode, 21 projects were identified for the total estimated amount of support of PLN 2,992.38 million. The most important of them are: Works on railway lines No. 132, 138, 147, 161, 180, 188, 654, 655, 657, 658, 699 on the section Gliwice - Bytom - Chorzów Stary - Mysłowice Brzezinka - Oświęcim and Dorota - Mysłowice Brzezinka (PLN 269.65 million); Works on railway lines No. 140, 148, 157, 159, 173, 689, 691 on the section Chybie - Żory - Rybnik - Nędza / Turze (PLN 262.45 million); Works on the railway line No. 1 on the section Częstochowa - Zawiercie (PLN 220.29 million); Works on railway lines No. 153, 199, 681, 682 and 872 on the section Toszek North - Rudziniec Gliwicki - Stare Koźle (PLN 240.26 million). As at 10/12/2019, 18 projects with a total co-financing of PLN 2,906.67 million were selected.

Connecting Europe Facility - CEF
Its purpose is to support the development of three areas - transport, energy and telecommunications networks. Budget: The available pool of funds for investments in the transport sector in the 2014-2020 financial perspective for beneficiaries from EU countries is over EUR 26 billion.

1. In 2014, 27 applications for co-financing were submitted. Thirteen applications were submitted for co-financing from the pool for cohesion countries, the others for general. The first are for a total amount of approx. EUR 4 billion, including EUR 2.8 billion is the expected contribution of the European Union (approx. 70% of funds available in the competition) and mainly concern rail investments of PKP PLK S.A., including on lines E59, E20, E75, CMK. The second includes projects implemented both by Polish entities - the total value is about EUR 165 million, the requested EU contribution is about EUR 34 million, as well as in partnership with other entities from Europe (so-called multi-applicant) - their cost is about PLN 30 million euro, half of which is assumed funding. The most important due to the TRITIA area are: Improving safety at level crossings on the route No. 4 - CMK (EUR 3.52 million); Research optimizing the operation and deployment of alternative fuel stations in the TEN-T core network (EUR 1.52 million); Preparation of documentation and pilot implementation of the interoperable infrastructure of electric vehicle charging stations together with supporting systems, on a selected section of the TEN-T core network in Poland (Abbreviation: IEVIS - Interoperable Electric Vehicles Infrastructure System) (7.96 million Euro); Establishment of Rail Freight Corridor "North Sea - Baltic" and its further development aiming at improving conditions for international rail freight transport (0.33 million Euro). 10 projects received. co-financing from the cohesion pool (EUR 1 937.26 million) and 8 from the general pool (EUR 6.2 million).
2. In 2015, 22 applications for co-financing from the pool for cohesion countries were submitted for a total amount of EUR 3.30 billion, including EUR 2.66 billion is the expected EU contribution and mainly concerned rail investments of PKP PLK S.A., including on E75, E30, E20 lines, seaport access lines and 8 applications for funding from the pool for all Member States worth EUR 14.94 million. The European Commission recommended 11 rail projects; 3 offshore and 1 ITS and Sesar projects for a total amount of EUR 1,893.43 million). The most important of them are: Modernization of the E 30 railway line, stage II, section Zabrze - Katowice - Kraków (EUR 410.2 million); Works on basic passenger routes (E 30 and E 65) in Silesia, stage I: line E 65 on the section Będzin - Katowice - Tychy - Czechowice Dziedzice - Zebrzydowice, together with ERTMS buildings on the section to Zawiercie (7.61 million Euro); National Road Traffic Management System on the TEN-T network - stage I (EUR 123.21 million).
3. In 2016, 21 applications were submitted (14 from the pool for cohesion countries, including 1 from the Slovak pool by the Slovak entity implementing the project in Poland and 7 from the general pool). They relate to large investment projects identified as priority in the Implementation Document, to be implemented by PKP PLK S.A. (on lines E30, C-E20, E65, E75, ERTMS buildings on railway lines over 1000 km) and GDDKiA (sections of expressways S1 and S3). The total value of submitted projects is EUR 3.2 billion, of which the requested CEF contribution is EUR 2.67 billion. The Commission approved 10 projects for a total of EUR 826.5 million. The most important of them are: ERTMS / ETCS development on the TEN-T core network lines (EUR 292.98 million); Works on the E 30 railway line on the section Kędzierzyn Koźle - Opole West (EUR 90.02 million); Works on the E65 railway line on the Będzin-Katowice-Tychy-CzechowiceDziedzice-Zebrzydowice section (EUR 94.95 million).
4. In 2017, 6 applications were submitted with a total value of EUR 842 million, of which the requested CEF contribution is EUR 208 million under CEF Transport

Blending. The Commission awarded EUR 80.46 million for 2 Polish transport projects: Works on the E59 railway line on the Wronki-Słonice section and Construction of the Northern Quay at the peninsula breakwater at the Outer Port of Gdansk.

5. On 17 May 2018, the European Commission together with the Innovation and Network Executive Agency announced the call for proposals from the transport sector under the Connecting Europe Facility (CEF). The estimated budget of the competition is EUR 450 million. During the announcement of the competition (May 2018) and the submission of applications (October 2018), the general pool of the CEF Instrument was not covered by the Public Finance Act. Which for PKP PLK meant the inability to obtain a national contribution to co-financing from CEF for potential projects submitted and positively evaluated in this competition. Thus, the entity did not submit any projects. As part of this recruitment, Poland received only 1.5% of the EUR 450 million pool. Projects were submitted only by Polish ports (Elimination of 'last mile' bottlenecks - construction of a reserve car park at the ferry terminal in Świnoujście; Feasibility study along with technical documentation of the intelligent road traffic management system at the Port of Gdynia; Expansion and modernization of the core network nodes at the Sea Port in terms of access road and rail infrastructure.
6. On October 16, 2019, the European Commission together with the Innovation and Network Executive Agency announced the call for proposals from the transport sector under the Connecting Europe Facility (CEF). The competition will be open until February 26, 2020 (deadline for submitting applications to the EC). The estimated budget of the CEF Transport Reflow Call competition, aimed at managing savings from current CEF projects, is EUR 1.4 billion, including EUR 750 million in the general pool (available to all EU countries) and EUR 650 million in the FS pool (available for cohesion countries).

Regional Operational Programs 2014-2020

Silesian voivodeship

Currently, as part of the regional operational program for the Śląskie Voivodeship 2014-2020 (list of projects as of 02.12.2019 for priority 6 - Transport, 17 projects are being implemented, for the total amount of co-financing of PLN 1,951,599,020.70. 2 of them concern rail transport : delivery of at least 10 pieces of electric multiple units for provincial rail passenger transport (PLN 138,669,000.00) and revitalization of railway lines No. 694/157/190/191 Bronów-Bieniowiec-Skoczów-Goleszów-Cieszyn / Wisła Głębce (324 744 PLN 500.00), the others relate to road line infrastructure.

Opole Voivodeship

Currently, under the regional operational program for the Opolskie Voivodeship 2014-2020 (list of projects as of 02.12.2019 for priority 6 - Transport, 59 projects are implemented, for the total amount of co-financing of PLN 821 141 262.73. 5 of them concern rail transport: Opolskie mobilne! - improving collective transport of the region and Opole agglomeration (PLN 53 868 089.06); Revitalization of railway line No. 287 Nysa - Opole (PLN 105 568 1970.96); Revitalization of railway line No. 288 Nysa - Brzeg (4 976 614, PLN 00); Stage II mobile Opolskie! - improving collective transport of the region and the Opole agglomeration (PLN 21 663 898.60); Revitalization of railway lines No. 301 and 293 on the section Opole - Kluczbork (PLN 4 827 220.50).

European Strategic Investment Fund
Under this fund, the PKP LHS Railway- Railway improvement Project is implemented. Thea im of the Project ist modernization of railway infrastructure including stations, signalling and level crossings, as well as purchase of the maintenance equipment for the dedicated broad gauge line (1520 mm) in the south-east of Poland, including in Sławków. Proposed EIB finance (Approximate amount) PLN 121 million (EUR 29 million).

NON-INVESTMENT SUPPORT
Tax relief
The possibility of applying for a refund of tax paid on means of transport was granted in art. 11a of the Act on local taxes and fees. Until 31 March of each year, taxpayers using means of transport referred to in art. 8 points 1-6 of the Act on local taxes and fees, for performing transport in combined transport on the territory of the Republic of Poland, may submit applications for reimbursement of tax paid in the previous year. It is about:

- trucks with a permissible total weight (dmc) above 3.5 tons,
- semi-trailer and ballast tractors adapted to be used together with a semi-trailer or trailer with a total vehicle weight from 3.5 tonnes,
- trailers and semi-trailers, which together with a motor vehicle have a GVW of 7 tons, except for those connected solely with agricultural activity conducted by the taxpayer of agricultural tax.

The definition of transport is in art. 4 point 13 of the Road Transport Act. The said provision stipulates that combined transport should mean the transport of goods during which a truck, trailer, semi-trailer with or without a pulling unit, swap body or 20-foot container or larger uses the road in the initial or final section of the transport, and on another section of the rail, inland waterway or maritime transport service, where the sea section exceeds 100 km in a straight line; initial or final carriage section means transport of:

- between the point where the goods are loaded and the nearest relevant railway loading station for the initial section and between the nearest relevant rail unloading station and the point where the goods are unloaded for the final section or
- within a radius not exceeding 150 km in a straight line from the inland or sea port of loading or unloading.

In summary, combined transport means that the means of transport uses a road at the beginning or end of the route, and the rest of the service uses rail, inland waterway or maritime transport.
The amount of tax refund on means of transport depends on the number of journeys with or without load carried out by the means of transport by rail in a given tax year. It is determined as follows:

- from 100 rides and more - 100% of the annual tax amount,
- 70 to 99 trips inclusive - 75% of the annual tax amount,
- from 50 to 69 journeys inclusive - 50% of the annual tax amount,
- from 20 to 49 trips inclusive - 25% of the annual tax amount.

To obtain a refund of tax paid, combined transport must be carried out on Polish territory. It is worth mentioning the judgment of the Supreme Administrative Court of October 22, 2008, reference number Act II FSK 992/07, from which it follows that: "The refund of tax on means of transport used in combined transport has been limited only to road and rail

transport and only the document confirming the performance of transport by rail is the basis for drawing up an application for refund of tax paid". In addition, according to court rulings, no refund of tax on means of transport is due if the container itself is transported by rail (cf. judgment of the Supreme Administrative Court of 13 March 2012, reference number II FSK 1624/10).

Fees for access to the railway infrastructure
Railway infrastructure managers are required to develop a uniform toll system for the duration of one annual train timetable for all. The manager may collect the following fees from applicants and railway carriers:
FROM THE APPLICANT:

- fee for handling the application for capacity allocation - the fee is set as the quotient of costs incurred by the manager for handling applications for capacity allocation and the number of applications submitted in the last completed year,
- booking fee for not using the allocated capacity - the fee is set as a percentage of the fee that the railway undertaking would have incurred for using the capacity allocated to the applicant.

The manager does not charge a fee if the railway undertaking applied to the President of UTK for a decision regarding the use of capacity.
FROM THE CARRIER:

- basic fee for services provided as part of the minimum access to the railway infrastructure related to the completed train journey - the fee is the product of the train route and the unit rate specified for the train journey over a distance of one kilometer. The unit rates of this fee are set by the manager at the direct costs incurred by the manager as a result of train travel. In order to recover all the costs incurred, the manager may, if he demonstrates that the market condition makes it possible, increase the rates.
- a maneuver fee for services provided as part of the minimum access to the railway infrastructure related to the maneuvers carried out. The unit rates of this fee are set by the manager at the direct costs incurred by the manager as a result of train travel.
- fee for allocated capacity for stopping trains.
- a booking fee for not using the allocated capacity.
- fees for additional and ancillary services specified in point 3 of Annex 2 to the Act.
- other fees for services specified in the network regulations provided by the manager when the carrier requests their performance in the application.

8.1.3. Slovakia

The projects listed in this chapter are directly relevant to ŽSK and there are no projects that have been implemented in other areas.

Projects financed from the Operational Program Integrated Infrastructure
ŽSR, Modernization of the line Púchov - Žilina, for speed up to 160 km / h, II. stage - (section Považská Teplá)
The project consisted of upgrading the existing 8.8 km long double track railway to a

speed of up to 160 km / h. Modernization of the technical infrastructure of the line on the given section, which is part of the TEN-T network and the European railway corridor no. In order to achieve parameters within the meaning of European Community legislation. Modernization of the station in Dolny Hričov and stops in Horní Hričov. In accordance with the noise study, noise barriers are designed to protect the population from the adverse effects of traffic.
Total costs amounted to € 46,651,636.97 The project was completed in 2018.
ŽSR, Modernization of railway line Žilina - Košice, section Liptovský Mikuláš - Poprad Tatry (outside), 1st stage (Poprad - Lučivná)
The project consists of the modernization of the railway line in the section Poprad - Štrba (Lučivná) in the total length of 12,868 km. The modernization of the track will achieve a new level of technical equipment and usability by incorporating the most modern and progressive elements and thus improving and improving its technical parameters as a whole. The section in question is divided into three integrated parts of the construction (UČS): the Poprad - Svit railway section, the Svit railway station, the Svit - Štrba railway section.
The total estimated costs are set at € 77,619,766.00 and the project is currently in the implementation phase.

Projects implemented by CEF - Connecting Europe Facility
Implementation of technical interoperability for the TAF TSI subsystem in ZSSK CARGO
The project aims to meet the requirements related to the construction of an interoperable rail system in the rail freight segment within the TEN-T rail network in terms of the standardization of mutual information exchange as defined in Regulation No. 1305/2014 / EC on the TAF TSI. Harmonization of telematics applications operated in ZSSK CARGO will support interconnection of information systems at national and EU level. The implementation of standards for telematics applications in rail freight will ensure a smooth and simple cross-border continuity of information services, which is a key factor in ensuring the quality of international rail services, especially in the fast-growing segment of international freight.
The total cost was € 2,667,000.00 and the project was completed in 2019.
Implementation of GSM-R into the ŽSR network, section Varín - Košice - Čierna nad Tisou state border
The aim of the project is the deployment of GSM-R on the railway line Varín - Košice - Čierna nad Tisou 329,374 km long, which is located on the corridor of the main network Rhine - Danube (CNC). It involves the preparation of detailed design and construction work related to GSM-R deployment. It includes 4 activities - preparatory tasks, supervision of construction work, construction work and project management. GSM-R will be used for voice and data communication and will allow future operation of a section with ETCS level 2 and above.
The total estimated cost is set at € 25,112,113.00 and the project is currently in the implementation phase.
Maintenance of 17 wagons of traction line trains (ŽSR)
The project consisted of the maintenance of 17 wagons of the traction line trains, deployed in Nové Zámky and Vrútky, destined for the renewal of the traction line on the railway network of ŽSR, intended for the transportation of the Armed Forces of the Slovak Republic.
The total cost was € 272,756.00 and the project was completed in 2016.

8.2. Evaluation of the effectiveness of grant programs

8.2.1. Czech republic

OP Transport 2007 -2013
Within the area of intervention 1.1. 139 projects were supported by the modernization of the TEN-T railway network. Within the TRITIA region, the projects were optimized for the Český Těšín - Dětmarovice railway line in km 332,200 - 333,076, the reconstruction of the Kunčice Head at the Ostrava Vítkovice railway station, the optimization of the Bystřice nad Olší - Český Těšín railway line. section Ostrava-Kunčice - Havířov on line 321 Opava East - Ostrava - Havířov - Český Těšín, construction of traction power station Albrechtice, Implementation of the IS for the support of rail freight transport according to the TAF TSI (beneficiary - AWT Doprava, a.s.), GSM-R in the section Ostrava - st. hr. SR and Prerov - Ceska Trebova and GSM-R Breclav - Prerov - Petrovice u Karvine.
Within the area of intervention 3.1. The modernization of the railway network outside the TEN-T network was supported by 120 projects. Within the TRITIA region, there were projects - rail connection of Leoš Janáček Ostrava Airport, reconstruction of the southern head of the Frýdek railway station at the Český Těšín railway station, including TZZ towards Hnojník, and reconstruction of rails no. 134 and 136 at the railway station Český Těšín.
The areas of Combined Transport covered Priority Axis 6 - Support for Multimodal Freight Transport and Development of Inland Waterway Transport, Area of Intervention 6.1 - Support for Multimodal Freight Transport, Purchase of Transport Vehicles for Transport and Transport Units for Transport, Modernization of Transport Stations.
As a result, little money was spent and basically there was no interest in subsidies for the construction or reconstruction of the infrastructure of KD terminals. One of the reasons was the short application period (approx. Less than 3 months) and there were situations where applicants needed eg to draw subsidies at a time when the call was not announced or their business situation changed.
There was also little interest in subsidies for transhipment mechanisms. Subsidies in the area of water transport were drawn to a much greater extent.
In the TRITIA region for the KD terminal in Paskov, OKD, Doprava, a.s. in the period 15.4.2008 - 24.11.2008 funds for the container transporter from ERDF - the total costs of the project amounted to 10 592 000 CZK, the contribution from EU funds 3 602 000 CZK (34%).
Outside the TRITIA region, it was the project Extension of the KD terminal in the port of Mělník for the Czech ports, a.s. with the period of implementation 31.3.2008- 29.12.2008. The total cost of the project was CZK 19,953,000 and the contribution from EU funds was CZK 6,785,000 (34%).

Siding support and revitalization program
The program did not fully meet expectations, as the applicants (beneficiaries) were not so interested in it. For many applicants, the uncertainty of meeting the minimum turnover volume of the siding was uncertain, and if they did not, they would have to repay a proportional part of the subsidy, including a 100% penalty. Calls for proposals have always been announced for a short period of time and the preparation of similar projects is a long-term issue, so it has often failed to combine this together. Difficulty of preparing the application - put all the annexes together within the given deadline and within the deadline to complete the project. Several applications were withdrawn because the business

strategy of the company was changed and the project was no longer needed. In one case, the applicant with the approved application stated that he had to withdraw it because he was not satisfied with the obligation to award all the supplies by a public contract - he wanted to choose his reliable supplier.
Therefore, the funds were shifted rather towards the support of KD. This program supported siding projects related to KD terminals.
Even so, support for sidings would probably attract more interest than the current public transhipment support program. Only some tens of percent of the total theoretical allocation of CZK 2.5 billion will probably be spent there. The last challenge is currently running.
Outside the TRITIA region, a project for the revitalization of the railway siding and crane run on the premises of METRANS, a.s. The project was implemented in 2011 - 2013. Total project costs including VAT 589 549 947 CZK, contribution from EU funds 258 713 259 CZK (43.88%).
The project Extension of the siding in the Lovochemie area in Lovosice in the period from March 2009 to May 2009 was also implemented.
Overall, within Priority Axis 6.1. 6 projects were supported in the total amount of CZK 373,744,259.

OP Transport 2014 -2020
Within this program period, subsidies were drawn to a greater extent than in 2007-2013. This support program was not successful. Support of up to CZK 2.5 billion was approved. There were 4 calls (Call No.9 in 2016, No.10 in 2017, No.66 in 2018, No.77 in 2019). However, within the first three calls, projects in the order of percent of the allocation have so far been approved. Most of the funds were reallocated to other targets, mainly for water transport, but even the remaining 800 million were used up by 10-20%. At present, there is virtually no serious interest in this form of support. A total of 8 projects have been approved so far, see below.
The main project benefiting from subsidies under this program in the TRITIA region - Priority Axis 1 - Infrastructure for rail and other sustainable transport, specific objective SC 1.3 - Creating conditions for greater use of multimodal transport was to build a container terminal in Ostrava - Mošnov (ICM) - Intermodal Center Mošnov) with public access. The recipient of the subsidy is OSTRAVA AIRPORT MULTIMODAL PARK s.r.o. Term of implementation 1.8.2019 - 1.1.2022. Total project costs CZK 767,543,442.92, Approved contribution from EU funds: CZK 276,833,197.90 (ie 36.06%).
Outside the TRITIA region for the project Purchase of railway cranes - KD Mělník transhipment station (contribution from EU funds - CZK 89 234 017,60), Construction of the KD Kolín transhipment station for T-PORT, spol. s r.o., (contribution from EU funds - CZK 26,514,516.91), Modernization of the transhipment station Černá za Bory (near Pardubice) - beneficiary of the subsidy T-PORT, spol. s r.o., contribution from EU funds - CZK 24,677,022.30),
Obrnice Terminal - Development, subsidy recipient - firm VELLERIN, as (contribution from EU funds -12 960 174,60 CZK), Obrnice units for UPLINE CZ sro, (contribution from EU funds - 3 030 000,00 CZK), Acquisition container translator for ČD-DUSS Terminal, as in Lovosice for ČD-DUSS Terminal, a.s. (contribution from EU funds - 6 125 000,00 CZK).
Overall, the terminal infrastructure was subsidized by EU funds mostly in the amount of about 40% of the total eligible costs and reloading equipment (translators, rail cranes) mostly also around 40%, handling units (semi-trailers, containers) around 25%.

Acquisition of combined transport units
Two calls No. 73 and 74 took place. One was closed on 15.5.2019 and the other on 10.1.2020.
In the first call, there was minimal interest from the applicants. The allocation of 400 million was far from exhausted.
As part of this program, a subsidy was approved in the TRITIA region for the project Purchase and Renewal of Semitrailers for Combined Transport of ČSAD LOGISTIK Ostrava a.s. with the realization date 30.4.2019 - 31.5.2020, the total costs of the project 30 426 176.00 CZK, contribution from EU funds 7 543 680.00 CZK (24.79%). It was the purchase of 20 pieces of semi-trailers mega (lowdeck) and 10 pieces of standard semi-trailers for combined transport ..
Outside the TRITIA region, it was the acquisition of units for the terminal in Obrnice, ie 40 pieces of 30-foot containers with side opening.

Railway and road infrastructure projects
Under Priority Axis 1 - Infrastructure for rail and other sustainable transport, specific objective of SC 1.1. Infrastructure improvement for higher competitiveness and greater utilization of rail transport was realized within the TRITIA region by the DOZ Ostrava Svinov - Petrovice u Karviné st. hr. (design of remote control system) and Dětmarovice (outside) - Mosty u Jablunkova st. hr., optimization of the line Český Těšín - Dětmarovice (Phase 1 took place in 2015 -2016 and now will be completed 2 phases (km 332,200 - 333,076 - in April 2020), construction of the Havířov hospital stop, reconstruction of Kunčice head at Ostrava railway station Vítkovice - phase II.

Implementation of the rolling stock subsystem - locomotives and rolling stock - enabling operation on the 25 kV / 50 Hz system
One call No.64 for submitting projects was announced for the period 7.12.2018 - 31.5.2019. This was a call under the State aid program “Ensuring rail interoperability”. The call was aimed at supporting the conversion of electric traction units equipped only for operation on a 3 kV DC system for operation as well as on a 25 kV / 50 Hz AC system. The original allocation for Call 64 was CZK 372,000,000. A total of 5 aid applications were submitted under the call, which were positively evaluated and recommended for approval. In order to support all projects in full, the call allocation was increased to CZK 396,450,000.

Equipping vehicles ETCS and GSM-R with units
Two calls were announced for this type of subsidy (27 December 2017 - 11 May 2018, 14 November 2019 - 29 January 2020). Almost the entire allocation was split, but within the evaluation some projects were excluded and others approved. The problem with ETCS is that suppliers are not able to execute orders within the given deadline - no successful contract has yet been concluded between the supplier and the recipient.
This type of subsidy will be drawn by carriers - METRANS a.s. (vehicle equipment ETCS - implementation date 1.3.2021- 31.12.2021), Unipetrol, Doprava, a.s. for equipping ECTS vehicles together with brake blocks in period 1.9.2018 - 31.12.2022, České dráhy in period 1.1.2019 - 31.12.2020 for equipping ETCS traction vehicles. And construction companies - eg Skanska, a.s. (retrofitting of vehicles with GSM-R system in the period 1.1.2019 - 30.4.2019) and infrastructure manager of SŽDC, s.o.

Energy consumption measurement system (carriers)
Applicants were interested in this type of subsidy. Two calls were announced - Call No. 15 (January 29, 2020 - May 15, 2020) and No. 47 (December 14, 2017 - June 30, 2021). The allocation was divided and the implementation phase of the projects is already underway - contracts are concluded by suppliers.
This type of subsidy was drawn on the one hand by carriers - eg Czech Railways (in the period 1.1.2019 - 31.12.2020), AWT, a.s. (now PKP International, a.s.), and further infrastructure manager ie SŽDC, s.o. (acquisition of 150 measuring boxes within the first application - 6.12.2017 - 30.4.2019 and 110 measuring boxes within the second application - 1.4.2019 - 31.12.2019),
Within the TRITIA region, AWT a.s. (now PKP International, a.s.) to equip 4 Skoda 121,130, 181 traction units with a system for measuring electricity consumption. Project implementation deadline - 1.1.2019 - 30.6.2020. Total project costs CZK 1,443,656.00, contribution from EU funds CZK 596,500.00.

Ensuring interoperability in rail transport - replacement of brake blocks for freight wagons
So far, the only call No. 46 was announced in the period 14.12.2017 - 20.4.2018. ČD Cargo, a.s. drew from this type of subsidy in the period from 1.10.2018 to 31.11.2021. - the total cost of the project was CZK 569,934,079.00, the contribution from EU funds was CZK 148,848,000.00. Furthermore, in the period 1.9.2018 - 31.12.2022 the subsidy was obtained by Unipetrol Doprava, a.s. to disguise 331 freight tankers and ETCS vehicles. The total cost of the project is 13 549 908,00 CZK, the contribution from EU funds 3 972 000,00 CZK.

Telematic applications in freight and passenger transport (TSI-TAF and TSI-TAP) - this was intended for only one recipient - SŽDC, s.o.
The call was announced on 27 December 2017 with a deadline of 30.6.2021. Applicants were interested in this kind of support, but in the end they used the CEF program and for smaller carriers it is possible to use SŽDC's web interfaces.

Construction and modernization of public ports for freight transport
The call was planned for November 2019, but eventually was not announced.

CEF program
Within the TRITIA region, the following projects were financed by the CEF Program:
removing bottlenecks on selected sections of lines on the network of main corridors in the Czech Republic
in the section Dětmarovice-Petrovice u Karviné-border with Poland on the corridor RFC5, implementation period April 2019 - December 2022, (outside the TRITIA region in the section Velim - Poříčany). Total eligible costs of the project 191 421 522 Eur, max. amount of EU subsidy 38 284 304 Eur (20%). Justified by the RFC 5, RFC 7 and RFC 9 corridors.
implementation of TAF TSI in AWT, a.s. (now PKP International, a.s.), implementation period: July 2017 - December 2020, total eligible project costs CZK 851,728, max. amount of EU subsidy, EUR 723 969 (85%)
Paskov Multimodal Container Terminal (terminal modernization - phase 3, 2 new tracks of 365 m length and 3 new tracks of 750 m), recipient of AWT subsidy, a.s. (now PKP

International, a.s.), implementation period February 2016 - December 2020, total eligible costs EUR 8 896 000, max. EU subsidy EUR 5 871 360 (66%), project was justified by RFC 5.
ETCS Petrovice u Karvine-Ostrava-Prerov-Breclav (part of the RFC5 corridor and the RFC7 corridor), beneficiary of SŽDC, s.o., implementation period: September 2016 - June 2020. Total. the eligible costs of the project were EUR 24 140 833, the maximum amount of the EU subsidy EUR 20 519 708,05 (85%) creation of the North Sea - Baltic Sea Corridor (RFC8) and improvement of conditions for international rail transport
the beneficiaries are from countries where the corridor passes, including the Czech Republic and Poland. Implementation period January 2015 - December 2020, total eligible project costs EUR 8 262 500, max. EU subsidy EUR 4 131 250 (50%)
Implementation of TAF TSI and TAP TSI into SŽDC IS - phase 3, beneficiary of SŽDC subsidy, s.o.,
January 2018 to December 2020, total eligible project costs EUR 3 206 150, maximum EU subsidy EUR 2 725 228 (85%).

8.2.2. Poland

ASSESSMENT OF THE EFFECTIVENESS OF IMPLEMENTING GRANT PROGRAMS
According to the report on the implementation of the National Railway Program implementation plan until 2023 for 2018, it follows that the financial execution of expenditure on railway projects from EU sources was 95% completed. The table below shows the financial execution by program.

Table 97 - Financial execution according to programs

Program	Plan 2018%
POiŚ	86%
CEF	97%
RPO	95%

Operational Program Infrastructure and Environment
Priority axis III (measures 1 and 2):
The implementation of the priority axis went smoothly. Possible minor issues were solved on an ongoing basis by the institutions involved. In the reporting period, further works were carried out related to the identification and inclusion of investments in the List of Identified Projects, and monitoring of non-competitive projects was also continued. Permanent assessment of submitted applications and the process of signing grant agreements and requesting payments and submitting applications to the EC.
Competitions: 1 call for proposals, recruitment budget: 232.4 million euros, 2.4% of the allocation.
List of Identified Projects: 96 projects, estimated funding: EUR 9.3 billion, 97.2% of the allocation.
Co-financing agreements: 88 contracts, investment value: EUR 13.95 billion, EU co-financing: EUR 7.7 billion, 74.2% of allocation; including non-competition mode: 61 contracts, investment value: EUR 13.3 billion, EU co-financing: EUR 6.8 billion, 71.6% of allocation.
Payment applications (beneficiary level): total value: EUR 5.4 billion, EU funding: EUR 4.3 billion, 45.6% of the allocation. Applications for payment to the EC: eligible expenditure: EUR 5.1 billion, refund requested: EUR 4.4 billion, 45.8% of allocation

Priority axis V (measures 1 and 2):
In 2018, work was carried out to announce the competition, identify and enter investments in the List of Identified Projects, and project monitoring was continued. Permanent assessment of applications from the competition and non-competition mode, the process of signing contracts for co-financing as well as applying for payments and submitting applications to the EC.
Competitions: 4 calls for proposals (including 1 in 2018), recruitment budget: EUR 838.9 million, 17% of allocation.
List of Identified Projects: 60 projects, estimated amount of funding: EUR 3.99 billion, 80% of the allocation.
Co-financing agreements: 58 contracts, investment value: EUR 6.9 billion, EU funding: EUR 3.9 billion, 77.7% of allocation; including non-competition mode: 41 contracts, investment value: EUR 5.3 billion, EU funding: EUR 3.1 million, 62.9% of allocation.
Payment applications (beneficiary level): 9 total value: EUR 1.4 billion, EU co-financing: EUR 867.8 million, 17.3% of allocation. Applications for payment to the EC: eligible expenditure: EUR 1 billion, refund requested: EUR 878.5 million, 18% allocation.
The most important risk areas that affected the implementation of transport projects are presented below:

- In the increase of project costs as a result of settled tender procedures.
- Delays in the investment preparation, among others at the stage of implementation of the Feasibility Study.
- Delays in project implementation due to changes in projects.
- Delays in obtaining administrative decisions.
- Delays in announcing tenders by the beneficiary, prolonged tendering procedures, poor quality of materials developed for the purposes of future tender procedures, appeals to the National Appeal Chamber, frequent cancellation of proceedings due to exceeding the value of the submitted offer in relation to the value intended for the contract.
- Acceptance procedures - low quality of project documentation (resulting in the need for corrections and re-evaluation, which extends the deadlines assumed in the schedules), delays in obtaining the necessary permits for placing in service. Problems with obtaining building permits due to lengthy procedures for obtaining RDEP provisions, lack of cooperation between GUNB and WINB and investors. Issues related to environmental documentation.

CEF - Connecting Europe
In the transport industry, CEF has already allocated 96% of the budget, and the support granted in the amount of EUR 22.8 billion has contributed to the launch of investments totaling EUR 48 billion. Investments in railways were supported by EUR 16 billion. Poland is the largest CEF beneficiary with a grant of over EUR 4.7 billion (taking into account all 3 sectors covered by the instrument, including EUR 4.2 billion in the transport sector).
Due to legal problems, PKP PLK did not participate in the competition in 2018. In earlier years, the proposals submitted were qualified by the EU for funding.
RPO WSL and RPO WO
The amount of funds obtained from this program for railway infrastructure is insignificant, mainly due to the regional nature of the projects.

8.2.3. Slovakia

The most important source of EU funding is the Integrated Infrastructure Operational Program, which is currently ongoing and will be completed at the end of 2023.

Table 98 - Ongoing drawing of OP II as of the beginning of 2020

Priority axis	Alocation (€)	Drawing (€) to 31.01.2020	Percent
1. Railway Infrastructure (TEN-T CORE) and Mobile Vehicle Renewal	725 839 166 €	264 953 037 €	36,50%
2. Road Infrastructure (TEN-T)	1 142 500 000 €	729 327 719 €	63,84%
3. Public passenger transport	322 350 000 €	142 584 582 €	44,23%
4. Water transport infrastructure (TEN-T CORE)	116 450 000 €	100 511 €	0,09%
5. Railway infrastructure	282 232 227 €	1 436 972 €	0,51%
6. Road infrastructure (outside TEN-T CORE)	484 757 228 €	125 876 257 €	25,97%
7. Information society	788 081 942 €	89 344 700 €	11,34%
8. Technical assistance	87 000 000 €	33 845 830 €	38,90%
Averall	3 949 210 563 €	1 387 469 608 €	35,13%

As can be seen from the table above, the biggest drawbacks in drawing funds are in rail transport. One of the main reasons is the change in the overall approach to the upgraded sections, when during the previous programming period the routes were planned for a cruising speed of 160 km / h, representing a significant financial burden resulting from the geographical breakdown of the areas where most of the railways are run. By the end of the program period, a significant increase in rail spending is expected, due to the ongoing preparation for the procurement of several projects, the most important of which is the completion of the Žilina junction with total costs of EUR 330 million excluding value added tax, thereby significantly improving drawing on financial resources in the main priority axis. From the rail transport point of view, a great effort was made to implement projects from the 3rd priority axis, within which the car parks around Bratislava are realized, including the preparation of project documentation for the electrification of selected sections in the Košice region. Significant investments are also going into the renewal of the tram infrastructure in Košice and Bratislava, including the preparation of the tram track extension to Petržalka, the city district of Bratislava.
The above table is valid for the whole Slovakia as the overall evaluation of the allocation of financial resources is evaluated for the whole territory and not separately by region.
These axes lack water transport, which only marginally entered the program and the funds allocated for water transport are intended for project preparation of projects that are planned for implementation from the next programming period, or from other financial sources, whether at national level or from EU funds.
The tables below list all major projects that are assigned to the current programming period and which concern rail transport. A list of all national projects can be found on the website of the Operational Program www.opii.gov.sk and, given their total number (81), are not listed here.

Table 99 - List of major projects in Priority Axis No. 1 - Railway Infrastructure (TEN-T CORE) and Mobile Means Rehabilitation

No	Name of project

1	Modernization of railway line Žilina – Košice, section Liptovský Mikuláš – Poprad Tatry (outside), realization of Paludza – Liptovský Hrádok
2	Modernization of section cross-border ČR/SR – Čadca – Krásno nad Kysucou, section Čadca – Krásno nad Kysucou (outside)
3	ŽSR, Railway junction Bratislava
4	ŽSR, Modernization of railway line Púchov – Žilina, for line speed up to 160 km/hod. – Stage I, section Púchov – Považská Teplá
5	ŽSR, Completion of the Žilina - Teplička marshalling yard and related railway infrastructure at the Žilina node, Stage I
6	Modernization of rolling stock ŽKV within OPII – 2. part

Table 100 - List of major projects in Priority Axis 3 - Public passenger transport

No	Name of project
1	Railway connection of town part Petržalka with centre of city, NS MHD Stage 1 Hlavná stanica – Janíkov dvor, operational section Bosákova ulica – Janíkov dvor, 2. part Bosákova – Janíkov dvor
2	Modernizácia električkových tratí v Košiciach – Stage II – 1. part

Table 101 - List of major projects in Priority Axis 5 - Railway Infrastructure (except TEN-T CORE)

No	Name of project
1	Implementation of ERTMS on Corridor Bratislava – Nové Zámky – Štúrovo/Komárno (ETCS L2 + GSM R)

As can be seen funding in rail transport is divided into a large number of projects, which are often of low value and real spending can only be evaluated at the end of the whole period, in view of the long-term preparation process of the project documents within the approval procedure.

8.3. Incorporation of externalities and tax policy

8.3.1. Czech republic

Table 102 - Classification of transport costs

Category of cargo	Private costs	External costs
Transport costs	Fuel and vehicle costs; tickets / fees	Costs paid by others (eg when providing free parking spaces)
Infrastructure costs	Tolls, vehicle taxes (road tax), highway stickers and part of fuel excise	Duty not covered by the user's infrastructure costs (usually paid from public budgets)
Accident costs	Costs covered by insurance, accident costs borne by the participant himself	Not covered by accident costs (eg pain and suffering caused by others)
Environmental costs	Damage (eg to health from emitted emissions)	Uncovered environmental damage (eg, nuisance to other noise)
Cost of congestion	Cost of own time	Cost of delay caused to others

Table 103 - External transport costs per 1000 tonne-kilometers in CZK

Road	2200
Railway	475
Waterway	425
Air	5125

Source: http://edice.cd.cz/EDICE/IZD/izd3_01/extnakl.pdf - rok 1995

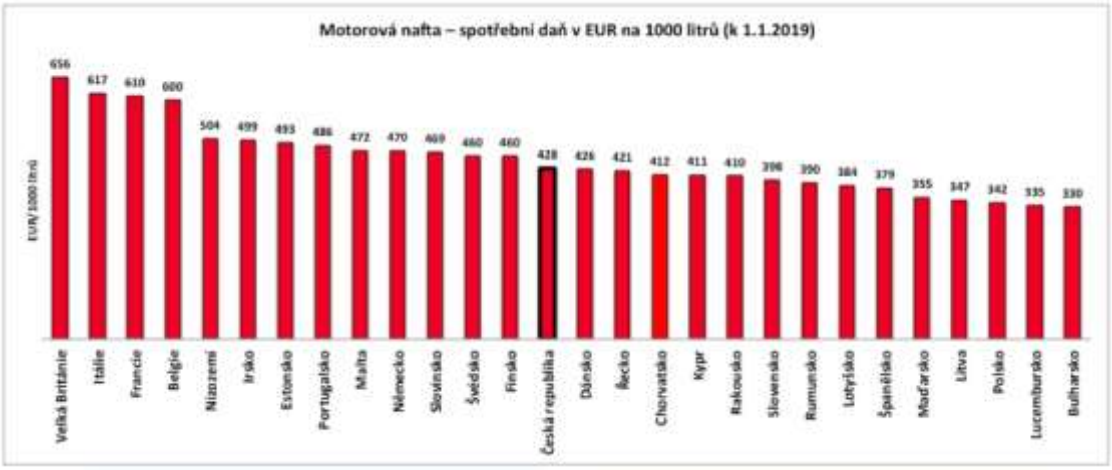
Analysis of trends in road freight transport - CDV March 2005
Annex 1 - External costs of transport processes in the Czech Republic
External costs and charges of a heavy truck moving 100 km low traffic section of the highway]

Total external costs	8-36 EUR
Average fees	12-24 EUR
Average infrastructure charges	8.3 EUR
Planned fee in Germany	13 EUR
Fee in Switzerland	36 EUR

Source: https://www.fd.cvut.cz/projects/k612x1do/ukazky/bc_pechota.pdf

Tax policy - Excise duty on fuel and VAT on mineral oils
The prescribed excise duty on fuel grew year-on-year in 2018. In total, the state prescribed excise taxes to drivers of CZK 91.98 billion for petrol and diesel, which is 1.48% more than last year. Although most of the prescription is generated in the long term by diesel, the prescription for gasoline is growing faster.
In the case of fuels, the state charges their consumption with a specific excise duty, the rate of which is CZK 10.95 / l of diesel and CZK 12.84 / l of petrol. Together with the value added tax (21%), it pays a significant tax amount from each refueled fuel. In the case of diesel fuel for CZK 30 / l, the tax burden is CZK 16.16, ie 53.86% of the price. This is one of the reasons why excise taxes are an important revenue item of the Treasury.
In 2018, the tax administrator prescribed drivers an excise tax on fuel amounting to CZK 91.98 billion, which includes a year-on-year tax increase of 1.48%. The vast majority, over 70% of this amount, is generated by the diesel tax. The year-on-year growth of 1.65% represents an increase in the prescribed tax liability to CZK 64.81 billion. Although the prescribed gasoline tax amounted to “only” CZK 27.02 billion in 2018, it increased by 5.04% year on year, thus growing much faster than the diesel tax.
The long-term trend of regulatory preferential treatment of diesel and preference for diesel engines is starting to cool, which will also be reflected in the increase in excise tax revenues on petrol. However, it should be added that diesel fuel is and will be at the core of excise taxation on fuel. Industry contributes more to the GDP of the Czech Republic than in any other EU country, which determines higher performance of road freight transport. Moreover, due to its location, it is an important transit country, which is the most economically advantageous in terms of route selection, toll costs and refueling, which increases the number of truck journeys in our country. ”

Figure 70 - Excise duty rates imposed on diesel consumption in the EU28



Data source: European Commission

This is confirmed by the partial output of the analysis, which calculates the cost of a road lorry over 12 tons per 100 kilometers in different countries in the structure of toll and fuel prices. While in Austria, the 100 km-long section of the toll motorway costs € 52.28 on average, € 58.26 in Germany, € 58.21 in Poland and € 55.19 in Slovakia, the cost of € 46.50 in the Czech Republic.

Table 104 - Fuel costs (diesel) and tolls (toll motorway) for trucks over 12t

Country	Toll	Oil	Price for 100 km
Země	**Náklady mýtné (EUR)**	**Náklady nafta (EUR)**	**Cena za 100 km (EUR)**
Chorvatsko	27,84	38,59	**66,43**
Rakousko	14,8	37,48	**52,28**
Itálie	26,6	44,37	**70,97**
Slovensko	18,5	36,69	**55,19**
Německo	18,3	39,96	**58,26**
Belgie	15,5	43,68	**59,18**
Česká republika	8,54	37,96	**46,50**
Polsko	22,2	36,01	**58,21**

Source: CETA calculations

Prices of diesel and petrol have long been below the median of the European Union. In 2018, tolls generated revenues of CZK 10.81 billion (+ 9.97% year on year) for the Czech state, of which CZK 9.987 billion was generated by trucks over 12 tons (+ 4.90% year on year).

In order to monitor the situation on the fuel market, the tax regulation, which arises from the release of the tax from the tax warehouse for free circulation, is more suitable than the actual collection of the tax. Direct debit raises the problem of deferred maturity and the direct debit need not be 100%. The prescription in the given month accurately reflects market events. Therefore, the taxed items according to nomenclatures were divided into petrol and diesel, for which the prescribed excise duty was analyzed and compared over time.

Source: study Analysis of consumer market tax evolution in the Czech Republic - Center for Economic and Market Analysis (CETA) in cooperation with W.A.G. payment solutions, a.s.

8.3.2. Polsko

External transport costs

Transport is a source of many significant externalities that are negative for society and the economy, which entails considerable social costs.

Table 105 - The amount of external costs in 2014 in Poland according to various categories (without congestion) is presented in the table below.

Category	Road transport			Railway transport	Inland waterway transport	Maritime transport
	vans	trucks	averall			
Accidents	145,87	26,47	44,12	0,52	0,00	0,00
Pollution of the lower atmosphere	46,46	17,39	21,80	2,86	14,02	5,89
Climate change (low scenario)	44,30	9,91	15,16	1,17	3,5	1,47
Noise	16,35	4,67	6,49	2,6	0,00	0,00
Congestions	108,02	35,97	46,59	0,00	0,00	0,00

Source: Cost-benefit analysis of transport projects co-financed from funds co-financed from European Union funds; development of a CENTER FOR EU TRANSPORT PROJECTS
https://www.cupt.gov.pl/images/zakladki/analiza_koszt%C3%B3w_i_korzysci/3.1.2.1.CUPT_Analiza_kosztow_i_korzysci_Vademecum_-_internet.pdf

Excise tax and fuel charge

An important source supplying the budget is excise duty. In 2015-2018 the profit on this account increased by 14%. In 2019 it amounted to approx. PLN 71 billion, and the forecast for 2020 provides for PLN 73 billion.

According to the notice, based on the delegation contained in art. 89 paragraph 1b point 1 of the Act of 6 December 2008 on excise tax (Journal of Laws of 2019, item 864, as amended), the Ministry of Finance announced that in 2020 the excise duty rates on motor fuels are:

1) motor gasolines with CN codes 2710 12 45 or 2710 12 49 and products resulting from the mixing of these gasolines with biocomponents, meeting the quality requirements specified in separate regulations - PLN 1537.00 / 1000 liters;

2) diesel oils with CN code 2710 19 43 and 2710 20 11 and products resulting from the mixing of these oils with bio-components that meet the quality requirements set out in separate regulations - PLN 1168.00 / 1000 liters;

3) biocomponents constituting self-contained fuels, meeting the quality requirements set out in separate regulations, intended for propulsion of internal combustion engines, irrespective of the CN code - PLN 1168.00 / 1000 liters.

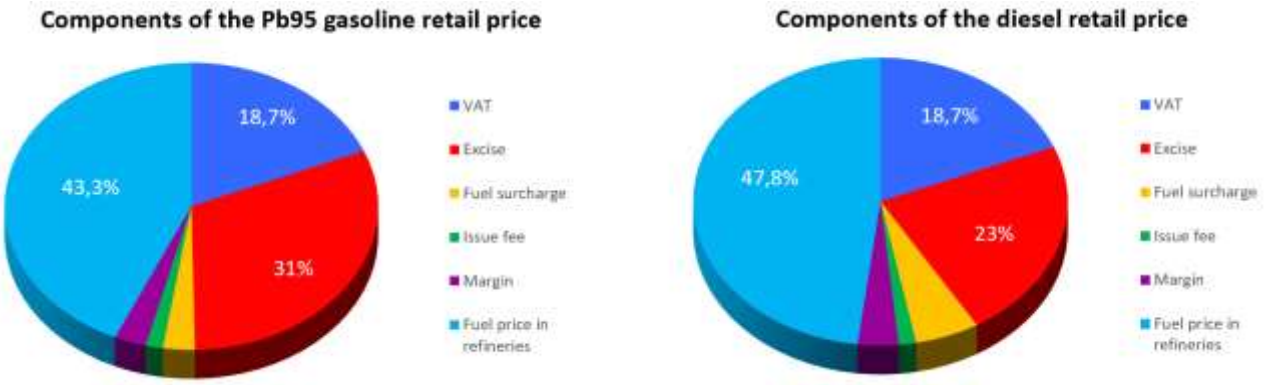
Thus, these rates are slightly lower than in 2019. This reduction will be offset by an increase in the fuel surcharge, which will amount to:

- The rate for 1,000 liters of gasoline will increase to PLN 138.49 from PLN 133.21 in force in 2019.
- The fee for 1000 l of diesel oils and products resulting from the mixing of these oils with biocomponents and biocomponents constituting self-contained fuels will increase to PLN 306.34 from PLN 297.61 in force in 2019.
- In turn, the fee for 1000 kg of gas will increase to 170.55 PLN from 164.61 PLN.

Proceeds from the fuel surcharge in 80 percent they supply the National Road Fund, and in 20% Railway Fund. Since the beginning of 2019, the companies producing motor fuels

have to pay an emission fee in addition to the fuel surcharge.

Figure 71 - The components of the retail price of Pb95 gasoline and diesel fuel



The transport industry also plays an important role in the economy in terms of budget revenues it generates. It is estimated that for every 100 km traveled, each truck generates approximately PLN 208 budget revenues (average for all vehicle classes indicated in the figure below). These influences depend on the permissible total weight of the vehicle. They include fees depending on fuel consumption (such as VAT, fuel tax and excise duty), tax on means of transport, environmental fee, registration fees as well as tax and social charges for entrepreneurs and drivers (including VAT, PIT, CIT and ZUS).

Figure 72 -Value of revenues generated for the state budget by a truck for each 100 km driven

For the needs of calculations, fuel consumption was assumed to be on average 31 l / 100 km. The diesel price was set at 5.6 PLN / l. The tax on means of transport was converted into 100 km based on average mileage of trucks in Poland, and the registration fee based on average mileage and average age of the truck in use. The environmental fee has been calculated using special calculators available on the websites of the Marshal's Offices.

8.3.3. Slovakia

Road transport

Table 106 - Classification of costs in road freight transport, Slovakia

Cost categorization	Own costs	External costs
Transport mean costs	Fuel costs, tire costs, engine and gear oil costs, treatment and maintenance of trailer, disposal of used vehicles, leasing costs.	Public area (parking)
Infrastructure costs	Toll costs, toll costs, road tax, motor vehicle tax,	Costs of construction, development and modernization of infrastructure (paid from the state budget)
Accident costs	Compulsory insurance, crew insurance, accident insurance,	Uncovered accident costs (eg pain and hardship caused by others)
Environmental costs	Damage to the environment	Cost of emissions, noise and vibration
Congestion costs	The cost of your own time	The cost of lost time

Railway transport

Table 107 - Classification of costs in railway freight transport, Slovakia

Cost categorization	Own costs	External costs
Transport mean costs	Fuel or traction costs, periodic maintenance costs, costs of technical operations before and after the journey,	
Infrastructure costs	Charges for access to railway infrastructure: - payment for the minimum access package - remuneration for track access to service facilities (remuneration for the use of electric power supply for the supply of electricity, remuneration for access to train assemblies and freight terminals owned or managed by the regulatory body) Cost of deposit (rent Depot)	Costs of construction, development and modernization of infrastructure (paid from the state budget)
Accident costs	Cost of safety certificates, Insurance to cover liability for damage caused by the provision of transport services on the network,	
Environmental costs	Damage to the environment	Cost of emissions, noise and vibration
Costs of ancillary services	Rental of premises and land, special repair and maintenance services of rolling stock	

<u>Internalization of negative externalities in rail transport:</u>

- mineral oil tax
- emission limits,
- noise charges,
- allowing free market access by separating infrastructure transport from operations;

- normative instruments should be oriented in such a way that freight wagons and locomotives reach the emission values of passenger trains in the long term.

The prices in the following tables have been recalculated to the price level of 2020 through GDP growth in Slovakia.

Table 108 - Quantified external transport costs

Indicator	**[EUR,2020]**
Unit value of time savings for cars and trucks adjusted for GDP growth	
VTTS unit value - business trips	18,62
VTTS unit value - commuting	7,73
VTTS Unit Value - Other (Private)	6,49
Unit time savings value for buses adjusted for GDP growth	
VTTS unit value - business trips	14,95
VTTS unit value - commuting	5,56
VTTS Unit Value - Other (Private)	4,66
Accident unit costs adjusted with GDP growth	
Fatal accident	1 855 682
Severe injury	255 928
Light injury	18 289
Material damage	3 417
Unit value of pollutant emissions adjusted by GDP growth	
NOx	30 398
NMVOC	2 417
SO_2	24 235
$PM_{2.5}$ (rural)	76 423
$PM_{2.5}$ (rural)	320 392
Development of the unit value of greenhouse gas emissions [EUR / t]	44,66

Source: Methodological Guide to the Expenditure and Income Analysis (CBA)

Impacts of air pollution on public health

Together with Poland, the Czechia and Hungary, we are among the countries with the highest air pollution in the EU. In particular, we have exceeded particulate matter (PM) contamination limits for a long time. According to the OECD, in 2015 it cost us air pollution due to premature deaths of EUR 9.279 billion, representing almost 6.5% of the country's GDP.

The air pollution is mainly caused by cardiovascular diseases, respiratory diseases including asthma and chronic bronchitis, cognitive disorders, reproductive problems including premature births or low birth weight.

Figure 73 - Development of greenhouse gas emissions in Slovakia

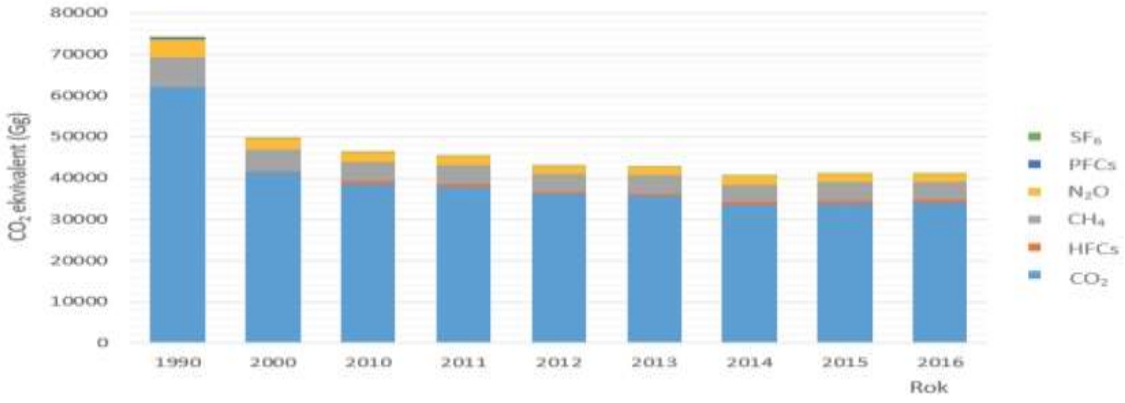


Table 109 - Unit external cost of road noise per 1000 vehicles [EUR, 2020]

Type of vehicle	Part of the day	Traffic intensity	City	Rural
Personal car	Day	High	7,46	0,12
		Low	18,29	0,12
	Night	High	13,75	0,12
		Low	33,32	0,35
Motorcycle	Day	High	15,14	0,12
		Low	36,58	0,35
	Night	High	27,49	0,12
		Low	66,52	0,47
Bus	Day	High	37,63	0,35
		Low	91,44	0,70
	Night	High	68,61	0,58
		Low	166,35	1,28
Truck up to 3.5 tons	Day	High	37,63	0,35
		Low	91,44	0,70
	Night	High	68,61	0,58
		Low	166,35	1,28
Truck over 3.5 tonnes	Day	High	69,19	0,58
		Low	167,98	1,28
	Night	High	126,27	1,05
		Low	306,14	2,21

Table 110 - Unit external cost of rail noise per 1000 vlkm [EUR, 2020]

Type of train	Part of the day	Traffic intensity	City	Suburb	Rural
Personal	Day	High	236,71	10,50	12,98
		Low	467,63	20,65	25,72
	Night		780,44	34,46	42,95
Freight	Day	High	419,72	20,65	25,84
		Low	1012,43	40,12	50,03
			1711,93	67,73	84,61

All of these externalities costs are commonly used in the calculation of cost benefit analyzes designed to assess major projects funded by EU structural funds.

External costs for heavy goods transport

Vehicle tax

The subject of the tax is a vehicle used in the taxable period for business activities within the meaning of the Commercial Code or for income from business and other self-employment pursuant to §6 sections 1 and 2 of Act no. 595/2003 Coll. on Income Tax as amended and registered in the Slovak Republic and the taxation is based on the number of axles and weight of the vehicle.

Table 111 – Taxation of vehicles based on the weight and axels

Number of axles	Total weight or maximum permissible total weight in tonnes		Annual tax rate in Euro
	from	to	
1 or 2 axles		1	74
	1	2	133
	2	4	212
	4	6	312
	6	8	417
	8	10	518
	10	12	620
	12	14	777
	14	16	933
	16	18	1 089
	18	20	1 252
	20	22	1 452
	22	24	1 660
	24	26	1 862
	26	28	2 075
	28	30	2 269
	30		2 480
3 axles		15	566
	15	17	673
	17	19	828
	19	21	982
	21	23	1 144
	23	25	1 295
	25	27	1 452
	27	29	1 599
	29	31	1 755
	31	33	1 964
	33	35	2 172
	35	37	2 375
	37	40	2 582
	over 40		2 790
4 and more axles		23	721
	23	25	877
	25	27	1 033
	27	29	1 189
	29	31	1 337
	31	33	1 548
	33	35	1 755
	35	37	1 968
	37	40	2 172
	over 40		2 375

Toll

The method of calculating the toll and the amount of the toll rate are set out in the Government Order of the Slovak Republic no. 497/2013 laying down the method of calculating the toll, the level of the toll rate and the system of discounts from toll rates for the use of defined road sections, as amended, taking into account the type of defined road section, vehicle category, EURO vehicle emission class and number vehicle axles.

The level of toll rates is adjusted annually, always on 1st January of the following current calendar year, rounded to three decimal places, based on the harmonized index of consumer prices in year-on-year comparison to September of the previous year published by the Statistical Office of the Slovak Republic.

Table 112 – Toll rates for the use of defined sections of motorways and expressways valid from 1 January 2019

	Vehicle category		Emission class		
			EURO 0 – II	EURO III, IV	EURO V, VI, EEV
Trucks	3,5 t – 12 t		0,108 €	0,098 €	0,085 €
	12 t and more	2 axles	0,231 €	0,209 €	0,181 €
		3 axles	0,244 €	0,220 €	0,190 €
		4 axles	0,253 €	0,228 €	0,198 €
		5 axles	0,244 €	0,220 €	0,190 €
Buses	3,5 t – 12 t		0,064 €	0,053 €	0,032 €
	12 t and more		0,116 €	0,105 €	0,064 €

Table 113 - Toll rates for the use of defined sections of class I roads parallel to motorways and expressways valid from 1 January 2019

	Vehicle category		Emission class		
			EURO 0 – II	EURO III, IV	EURO V, VI, EEV
Trucks	3,5 t – 12 t		0,108 €	0,098 €	0,085 €
	12 t and more	2 axles	0,231 €	0,209 €	0,181 €
		3 axles	0,244 €	0,220 €	0,190 €
		4 axles	0,253 €	0,228 €	0,198 €
		5 axles	0,244 €	0,220 €	0,190 €
Buses	3,5 t – 12 t		0,043 €	0,032 €	0,022 €
	12 t and more		0,085 €	0,074 €	0,043 €

Table 114 – Toll rates for the use of defined sections of Class I roads that are not parallel to motorways and expressways valid from 1 January 2019

	Vehicle category		Emission class		
			EURO 0 – II	EURO III, IV	EURO V, VI, EEV
Trucks	3,5 t – 12 t		0,085 €	0,076 €	0,066 €
	12 t and more	2 axles	0,181 €	0,164 €	0,140 €
		3 axles	0,190 €	0,172 €	0,147 €
		4 axles	0,195 €	0,176 €	0,150 €
		5 axles	0,190 €	0,172 €	0,147 €
Buses	3,5 t – 12 t		0,043 €	0,032 €	0,022 €
	12 t and more		0,085 €	0,074 €	0,043 €

Fuel price composition

Fuel price = production costs +excise duty + value added tax (20%) + profit, value added tax is calculated from price plus excise duty.

Table 115 – Excise duty rates with corresponding nomenclature number:

Fuel type	Price
Petrol (2710 12 41, 2710 12 45, 2710 12 49)	547 eur/1 000 l
Petrol (2710 12 31, 2710 12 51, 2710 12 59)	597,49 eur/1 000 l
Petrol with bioethanol and Biogenic substance	514 eur/1000 l
Aviation gasoline (2710 19 21 a 2710 19 25)	481,31 eur/1 000 l
Diesel (2710 19 43, 2710 19 46, 2710 19 47, 2710 19 48, 2710 20 11, 2710 20 15, 2710 20 17, 2710 20 19)	393 eur/1 000 l
Diesel with Biodiesel and Biogenic substance	368 eur/1 000 l

8.4. Customs sonditions

Basic customs legislation (EU regulations and Czech laws)

Regulation eur. (EU) No 952/2013 of the European Parliament and of the Council of 9 October 2013 establishing the Union Customs Code
Commission Delegated Regulation (EU) 2015/2446 supplementing Regulation (EU) No 952/2013 of the European Parliament and of the Council as regards the detailed rules for certain provisions of the Union Customs Code (eg templates of declarations, etc.)
Commission Implementing Regulation (EU) 2015/2447 laying down detailed rules for implementing certain provisions of Regulation (EU) No 952/2013 of the European Parliament and of the Council laying down the Union Customs Code
Commission Delegated Regulation (EU) No 2016/341 supplementing Regulation (EU) No 952/2013 of the European Parliament and of the Council as regards transitional rules for certain provisions of the Union Customs Code when the relevant electronic systems are not yet operational and amending Commission Delegated Regulation (EU) 2015/2446
29.7.2016 national customs legislation entered into force
Council Regulation (EC) No 1186/2009 establishing a Community system of reliefs from customs duty
(Material for fixing and protection of goods during transport, fuel in standard tanks of means of transport are exempt from customs duties in relation to transport).

Act No. 242/2016 - Customs Act (New Customs Act)
Government Regulation No. 244/2016 on the implementation of certain provisions of the Customs Act in the field of statistics (INTRASTAT)
Decree No. 245/2016 implementing certain provisions of the Customs Act.
Imports and exports of goods are exempted from customs duties, quotas and other free trade barriers when trading within the European Union (EU). However, the customs procedure affects foreign trade with non-EU countries, with the possible customs duty or customs duty being collected by the State through the customs administration. The incurrence of a customs debt is usually linked to the decision of the locally competent customs office to release the goods for free circulation.

Imported or exported goods may or may not be subject to duties, taking into account eg international agreements on preferential or non-preferential trade, trade policy measures or various forms of quotas and tariff or non-tariff suspensions. Uniform procedures of customs authorities in the framework of customs procedures are regulated mainly by EU legislation. During the customs procedure, the data in the documents with the actual status of the goods are verified. In most cases, the customs authorities check in particular that the documents presented are correct, but they may also carry out a partial or complete physical check of the goods.

The main customs procedures include:

- release for free circulation,
- transit,
- inward processing,
- temporary admission with partial or total relief from import duties,
- outward processing,
- export,
- storage in a customs warehouse
- processing under customs control

Export of goods from EU

By issuing an export accompanying document (hereinafter referred to as 'EIA') accompanying the goods to the EU border, the goods are placed under the customs export procedure. Goods shall be released for export on condition that they leave the EU customs territory in the same condition as when the export declaration was accepted, not only as regards the nature of the goods but also the commercial documents accompanying the consignment to the EU customs office of exit.
It is established through the IMD that the goods have not entered the EU internal market and therefore their sale is exempt from VAT under the provisions of § 66 of the VAT Act. The determination of the amount of duty, if any, is then carried out in the vast majority of the recipient's country of goods destination.

Imports of goods into the EU

Imports of goods from countries outside the EU concern not only business entities, but in recent years the interest of consumers from the Czech Republic in shopping from foreign e-shops, especially from China, Taiwan or USA, has also increased.
All goods arriving in the EU from abroad are subject to customs clearance.
E.g. if the goods are shipped from the USA they must first be under the customs export procedure. A summary declaration (electronically) must be lodged before entry into EU territory and a transit declaration must be lodged on entry in EU territory in order for the goods to be transported to the competent inland customs office under customs control, where into related customs procedures. If the goods are not subject to processing or storage requirements, they shall normally be released for free circulation, with the customs duties being paid to the account of the competent customs office within 10 days of release. The recipient of the goods or their chosen representative, the so-called declarant (eg forwarding companies, the Czech Post), proposes to release the goods for free circulation.

Customs procedures do not always lead to the assessment of customs duties, depending in particular on the value and type of goods imported. Some goods are exempt from

customs duties. In the area of transport, the exemption applies, for example, to the material used to fix goods, fuel in the normal tanks of motor vehicles for commercial use.

Figure 74 - Customs rules for Imports of goods into the EU

The rates of duty are mostly in the range of 1 % to 10 % of the value of the goods (+ possible foreign transport or insurance costs) and are assessed on the basis of the attached invoice. The amount of duty can be calculated by the importer using the Taric CZ system, but it is important to correctly classify the goods into the appropriate category.

The obligation to pay customs duties on the importation of goods is referred to as a customs debt, which includes, in addition to customs duties, other taxes (VAT, excise duty) and customs duties. The customs debt for the given goods is assessed and recovered by the customs authority in the course of customs proceedings, while in the Czech Republic value added tax is proven by filing a tax return with the local tax office. If the customs debt is not paid, the customs administration may impose a fine of up to CZK 50,000 or confiscate the goods themselves.
The customs value of the imported goods (the basis for calculating the duty) shall include:
the intrinsic value of the goods,
foreign freight costs along the EU border,
insurance, etc.
The duty shall be calculated by multiplying the customs value of the goods by the applicable rate of duty for the category of goods in question.

The following is included in the VAT base:
the intrinsic value of the goods,
customs duties, if any,
Freight (EU section), if not included in customs duties (customs value)
According to the VAT Act No. 235/2004 Coll. (including its amendments) of 15 November 2018, the import of goods, export of goods and transport and services directly related to the import and export of goods are exempt from tax with the right to deduct.

ROAD TRANSPORT

In the field of road transport, the Convention on the Contract of Carriage in International Road Freight (CMR) applies, which uniformly regulates the terms of the contract of carriage in international road freight transport, in particular as regards the transport documents used for such transport and the liability of the carrier.

Transit procedure under cover of a TIR carnet

Under the customs legislation of the Union, the transit procedure under cover of a TIR carnet may be used in the customs territory of the Union only for shipments which have been initiated or are to end outside the customs territory of the Union or take place between two points in the customs territory of the Union through the territory of a third country.

As of 21 January 2016, the TIR Convention has 69 Contracting Parties, including the EU and its 27 Member States. However, a TIR operation is only possible in countries that have approved guarantee associations.

The TIR Carnet is an international customs document guaranteeing the customs authorities in transit for a customs debt of up to $ 50,000 or € 100,000.

Goods transported under cover of a TIR carnet pursuant to the provisions of the TIR Convention shall not be subject to payment or the lodging of import or export duties and taxes at border customs, and shall normally not be subject to customs control at border customs.

The TIR Carnet Convention is based on the five basic pillars of the TIR transit system: goods are transported in customs-safe vehicles or containers;

- the duties and taxes at risk are secured by an internationally valid guarantee during the transport;
- the goods are accompanied by an internationally recognized carnet, which enters into force in the country of departure and which serves as a control document in the country of departure, transit and destination;
- customs control measures carried out in the country of departure are recognized in both the transit countries and the country of destination;
- controlled access of TIR to carriers and issuing and guaranteeing associations

Foreign Entry Authorization - CEMT Authorization

CEMT authorizations are multilateral authorizations for international road freight transport for hire or reward carried out under a contingent system by transport undertakings established in a CEMT Member State:

between CEMT Member States,

transit through the territory of one or more CEMT Member States by vehicles registered in a CEMT Member State.

The permits issued are:

One-off permits - valid for a return trip

CEMT short-term permits - valid for 30 days (for EURO IV vehicles and better)

Permanent CEMT permits - valid for one calendar year (for EURO IV vehicles and better)

The permit is issued by the ČESMAD BOHEMIA regional office. Most permits are freely available during the year. Annual authorizations limited to certain countries (Austria, Italy, Greece, Russia, Hungary) are granted on the basis of an application to be submitted by 30 November at the latest for the allocation of the authorization for the following calendar year.

What is required to issue a permit:

- At least one vehicle registered
- Valid concession (or other business license)
- CEMT certificate (from manufacturer and from MOT)
- Copy of the registration card

Limitations on the validity of authorizations
Some authorizations may not be used in the territory of some Member States. To this end, these authorizations shall be marked with a red stamp. This is the case for certain authorizations that do not apply in Austria, Greece, Italy or Hungary. Short-term (monthly) permits are never valid in Austria.
The authorization shall not apply to transport between a Member State and a third (non-member) State.

RAILWAY TRANSPORT
The provisions of the Convention on International Carriage by Rail (COTIF) and the Treaty on International Railways apply to international rail transport. transport of CIM goods, which is governed by the "western countries" (west of the Czech Republic) and the Agreement on International Carriage of Goods by Rail (SMGS), which is in force in CIS countries and some other European and Asian countries.
For rail transport to the east (simplified to CIS countries, China, etc.), besides transhipment from standard gauge cars (1435 mm) to wide gauge cars (1520 mm), it is necessary to perform a so-called new record, ie transcription of data from NL CIM to NL SMGS.

<u>In transit under COTIF:</u>
Some railway carriers (eg ČD Cargo, a.s., AWT, a.s., Metrans Rail, s.r.o., Metrans and Rail Cargo) benefit from simplification in the transit procedure in the EU and in the common transit countries. The simplification consists in submitting documents for customs clearance by electronic means:
On import is necessary to submit:

- Single Declaration (SAD) for release for free circulation,
- CIM consignment notes and commercial documents relating to the import operation.

On export is necessary to submit:

- Export Accompanying Document (VDD)
- CIM consignment notes and commercial documents relating to the export operation.

The aforementioned carriers are trusted and reliable firms for which the customs administration does not carry out inspections so often but only at random.

<u>In SMGS transit mode:</u>
The customs procedure is similar, with the same documents as for the COTIF transit procedure, but the consignment notes meet the standards set by the international SMGS agreement.
Within the Czech Republic, the transport of goods is governed by the rules set out in the Railway Transport Regulations.

8.5. Permit to carry large and heavy loads

We are talking about the transport of oversized cargo if the dimensions of the vehicle or weight exceed the rates stipulated by Decree of the Ministry of Transport No. 209/2018 Coll.
The use of a motorway, a road or a local road by such a vehicle or set shall be subject to a transport license pursuant to Section 25 (6) (a). a) of the Act on Roads. Permits to carry oversized and excessively heavy loads fall under the special use of infrastructure.
Pursuant to Section 25 (1) of Act No. 13/1997 Coll. on Roads (Amendment No. 193/2018 Coll.) for the use of motorways, roads and local roads in a manner other than usual or for purposes other than those for which they are intended (hereinafter referred to as "special use") the authority issued with the prior consent of the owner of the road in question, and if special use may affect the safety or fluency of road traffic, also with the prior approval of the Ministry of the Interior in the case of a motorway;
Road administration authorities are (according to § 40 of the same Act):

- municipal authority - on local roads;
- regional authority - on roads I, II. and III. class (except motorways), if the transport route does not exceed the territorial perimeter of one region;
- Ministry of Transport - on motorways and also on roads in cases where the transport route exceeds the territorial perimeter of one region.

Issue of a permit according to § 25 para. a) of the Act on Roads is subject to the Act No. 634/2004 Coll., on Administrative Fees, as amended, and its Annex, the List of Administrative Fees, Item No. 35, subject to payment of the administrative fee.

The data necessary for issuing the permit are set out in Section 40 of Decree No. 104/1997 Coll., Implementing the Act on Roads, as amended. A sample application form is available for download below.

As the following tables and comparisons show, the legislation in individual countries of the TRITIA region is ragged, heterogeneous, different and unification of conditions, or at least their approximation would be very necessary and would also speed up the process of approval of individual transports, their conditions etc. In view of the fact that, until the construction of ports in the Czech Republic (Ostrava or Mošnov), ports in the PL could be used.

Table 116 – Legislation for heavy goods transport in individual TRITIA countries

Question	Answer
What legislation regulates the oversized transport ? (*No. of regulation*)	CZ - **Decree of the Ministry of Transport No. 341/2014 Coll. on approving technical qualification and technical conditions of road vehicle operation on roads. The details required for receiving the authorization are specified in Section 40 of Decree No. 104/1997 Coll., implementing the Act on roadways, as amended.** SK - **TP 103 Authorization for special use of infrastructure for the transport of excessive and oversized goods (and some related selected duties of road managers and other entities). TP 103 also contains references to other legislation** PL – **Traffic rules Nr.108/2005**

<table>
<tr><td>Is in your country/region a route map of oversized goods in your country/region available?
(If “yes” - sent please, maps or link of websites)</td><td>CZ – No
SK - <u>http://www.cdb.sk/sk/Urcovanie-tras-pre-prepravu-NNN/statisticke-udaje-o-NNN.alej</u>
PL - Yes, the list of national roads and highways is in the appendix to permit category VI.</td></tr>
<tr><td>Exists in your country/region database of oversized/heavy transports ?
(If "yes" put, please, the link of websites or other source)</td><td>CZ – No, only traffic information (mobility, accidents, restriction)
SK - <u>http://www.cdb.sk/sk/Urcovanie-tras-pre-prepravu-NNN/statisticke-udaje-o-NNN.alej</u>
PL - ??</td></tr>
<tr><td>Are in your country a websites information focused on transport information, transport closurings, warning of oversized transport ?
(If "yes" put,please, the link of websites)</td><td>CZ – <u>http://www.dopravniinfo.cz</u>
SK - <u>http://www.zjazdnost.sk/map/view.html</u> Information and warning about oversized / heavy transport is also reported in local media
PL - ??</td></tr>
<tr><td>Are reqiured a private or other accompanying vehicles ?
(if "yes" – describe, please, a limit parameters and quantity)</td><td>CZ – for dimension to (22 x 3,2 x 4,55) m, 55 t without escort , (30 x 4,2 x 5) m, 60 t one or two escort cars, more than (30 x 5 x 5) m, 60 t two escort cars, according to the Office´s decision three and more escort cars
SK -
<table>
<tr><th>Transport</th><th>Parameter</th><th>Parameter size</th><th>Requirements of accompanying vehicles</th></tr>
<tr><td rowspan="10">Oversized transport</td><td rowspan="5">Total width of vehicle / vehicles unit including load</td><td>2,56 - 3,00 m</td><td>without accompaniment</td></tr>
<tr><td>3,01 - 3,50 m</td><td>1 accompanying vehicle</td></tr>
<tr><td>3,51 - 4,50 m</td><td>2 accompanying vehicles</td></tr>
<tr><td>4,51 - 5,00 m</td><td>3 accompanying vehicles</td></tr>
<tr><td>> 5,00 m</td><td>police escort</td></tr>
<tr><td rowspan="3">Total height of vehicle / vehicles unit including load</td><td>4,01 - 4,50 m</td><td>wi hout accompaniment</td></tr>
<tr><td>4,51 - 5,50 m</td><td>1 accompanying vehicle</td></tr>
<tr><td>> 5,50 m</td><td>2 accompanying vehicles</td></tr>
<tr><td rowspan="3">Total lenght of vehicle / vehicles unit including load</td><td>≤ 23,00 m</td><td>without accompaniment</td></tr>
<tr><td>23,01 - 30,00 m</td><td>1 accompanying vehicle</td></tr>
<tr><td>> 30,00 m</td><td>2 accompanying ehicles</td></tr>
<tr><td rowspan="4">Heavy transport</td><td rowspan="4">Total weight of vehicle / vehicles unit including load</td><td>≤ 40,00 t</td><td>without accompaniment</td></tr>
<tr><td>40,01 - 60,00 t</td><td>1 accompanying vehicle</td></tr>
<tr><td>60,01 - 120 t</td><td>2 accompanying vehicles</td></tr>
<tr><td>> 120 t</td><td>police escort</td></tr>
</table>
PL – for dimension (23 x 3,2 x 4,5) m, 60 t one escort car, (30 x 3,6 x 4,7) m, 80 t two escort cars</td></tr>
<tr><td>When the presence of the police is required?
(describe, please, condition of the compulsory police attendance)</td><td>CZ – For dimension more than length 50 m, or width 5 m, or height 5 m, or total weight of vehicle 150 t
SK - When total width of vehicle / vehicles unit is over 5 metres or when total weight of vehicle / vehicles unit is over 120 tons.
PL – only private escort</td></tr>
</table>

How are solve of divisible load ?	CZ – **Czech law does not specify an indivisible load** SK - **As a "repeated transport" according to TP 103, chapter 2.10** PL - **According to Ministry od Infrastructure and Construction, unmounted parts are still one "indivisible load"., however, many times the police and road inspectors are of a different opinion**
Are in your region/country a interest groups or associations dealing with the transport of excessive costs ? (if "yes", put , please, link of websites)	CZ – **ČESTAND – http://www.cestand.cz , ČESMAD Bohemia – http://www.prodopravce.cz** SK - **ČESMAD Slovakia - https://www.cesmad.sk** PL - **??**
Which authorities are competent to permission ?	CZ – **Ministry of Transportation** SK - **Competent road autority, communications manager (Slovak Road Administration, National Motorway Company / Granvia Operation a.s., …), owner or operator of the railway, police** PL – **General Director for National Roads and Motorways, Head of Customs Office, President of City or Road Administrators**
What documents/certificates are required by the Authorities to issue a permit ?	CZ – **Vehicle registration, Certificate of Incorporation, Eurrolicence, Power of Attorney** SK - **Abnormal road transport application form** **Vehicle / vehicles unit outline of all dimensions and load location** **Decision on special use of roads – authorization** **Request to establish a route for transport of oversized or heavy load** **Certificate of vehicle registration, as the case may be a certificate of compliance (COC) or a declaration of manufacturer / manufacturer's representative of the parameters vehicles to carry out the requested shipment** **Static reviews to required bridges** **The views of the communications managers** **Consent of the owner or operator of the railway when passing through the railway crossing (excluding railway sidings)** **Authorization of closures and detours** PL – **??**
Are in your country a long-term permits in your the country? (if "yes" - what parameters and conditions)	CZ – **Yes, but only for Czech transport companies (20 x 3,5 x 4,5) m, 42 tons, validity 3 months** SK – **No** PL – **Yes, there are six categories of long term permits and one for singkle route**
Is there an electronic system for applying for authorization ? (*If "yes" put, please, the link*	CZ – **No** SK - **https://ismcs.cdb.sk/portal/Trasy/Trasovanie/Trasovanie.aspx , https://www.ndsas.sk/sluzby/posudenie-**

of websites or other source)	**prepravy/prihlasenie** PL – **No, all permits are issued on paper**
Are available to download the price list, documents or forms ? ***(If "yes", please put the link of websites)***	**https://www.slov-lex.sk/static/pdf/1995/145/ZZ_1995_145_20180315.pdf - Items 80, 80a in the Annex to the Act**
How long it takes processing of application form for permission ? ***(days / months)***	CZ – **30 days (60 days for difficult transports)** SK - **within 30 or up to 60 days** PL – **from 3 to 30 days**

8.6. Permit to carry dangerous goods

8.6.1. Czech republic

The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) specifies in detail the types of dangerous substances and the conditions under which those substances are allowed to be transported by road. The "ADR Agreement" is updated regularly every 2 years. Currently, the current version of ADR 2019, effective from 1 January 2019.
ADR Agreement - Decree 64/1987 Coll. is published in the Collection of International Treaties in English. In the Czech version it is published as a Communication of the MFA. No authorizations for this type of transport are needed by the Ministry of Transport, as was the case in previous years. It is sufficient that the carrier complies with the conditions set out in the ADR Agreement. Only exceptionally, for example for the transport of radioactive or explosive substances, does the type of packaging permit.
The proof of conclusion of the contract of carriage as well as the acceptance of the consignment for transport by the carrier is the consignment note issued by the sender. It must be signed by the consignor and the carrier. the sheet shall state, inter alia, the nature of the goods transported and the type of packaging (for goods of a dangerous nature their generally recognized designation). It is made in three originals, the first of which is received by the sender, the second is accompanied by the consignment (later issued to the consignee) and the third is retained by the carrier. Among other things, the consignor should instruct the carrier how to handle the dangerous substance during transport or in the event of an accident.

For rail transport, the RID - Regulations for International Rail Transport applies of dangerous goods (RID - Appendix C to the Convention), as amended by Commission Implementing Decision (EU) 2018/936 of 29 June 2018 authorizing Member States pursuant to Directive 2008/68 / EC on the inland transport of dangerous goods deviations, which began to apply in 2019.
The RID prescribes which types of consignments containing dangerous substances can be carried and under what conditions. At the same time, substances that cannot be transported are listed.
Only containers, large packagings, IBCs and tanks (tank wagons, demountable tanks,

battery wagons, MEGCs, portable tanks and tank containers) approved and suitable for the carriage of the substances concerned and bearing the RID marks may be used for carriage. During loading and handling, special regulations for loading and handling must be observed. Packaging must be checked for damage.
In addition, certain substances may have designated routes on which they can be transported due to their danger (Government Order No. 152/1992 Coll., On Protective Zones of Natural Healing Resources of the Františkovy Lázně Spa).
If all conditions are met, the shipper (customer) can realize the transport by concluding a contract of carriage with the carrier, ie acceptance of the wagon consignment by the carrier for carriage and confirming its acceptance for carriage by the carrier in the consignment note. The shipments are carried out on the CIM / SMGS consignment note.
At ČD Cargo, a change in the contract of carriage is permitted only in cases of a transport obstruction, and with the consent of the relevant ČD Cargo security advisor.
For the carriage of nuclear materials and radionuclide emitters, the consignment note must be accompanied by a shipment permit pursuant to a special legal regulation.

8.6.2. Poland

Transport of dangerous goods by road
European Agreement concerning the International Carriage of Dangerous Goods by Road - ADR
The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), done at Geneva on September 30, 1957, was ratified by Poland in 1975 - all parties to the agreement were listed on the website of the United Nations Economic Commission for Europe.

The ADR agreement is a comprehensive legal act covering the scope of regulation in a number of areas related to the transport of dangerous goods. It consists of the relevant Agreement specifying the legal relationship between the participating parties and Annexes A and B, which contain provisions regulating to a wide extent the conditions of transport of individual dangerous goods in road transport.

The provisions of the contract are amended in a two-year cycle - the updated official Polish language version of the contract (consolidated text) is published in the Journal of Laws.
National regulations:

- The Act of 19 August 2011 on the transport of dangerous goods
- Ordinance of the Minister of Transport, Construction and Maritime Economy of August 14, 2012 regarding the form of the annual report on the activity in the field of transport of dangerous goods and how to fill it in
- Ordinance of the Minister of Infrastructure and Development of 7 May 2015 on obtaining the certificate of an advisor for the security of the transport of dangerous goods
- Ordinance of the Minister of Transport, Construction and Maritime Economy of February 15, 2012 on exams for drivers transporting dangerous goods
- Ordinance of the Minister of Transport, Construction and Maritime Economy of May 29, 2012 on conducting courses on the transport of dangerous goods
- Regulation of the Minister of Transport, Construction and Maritime Economy of February 15, 2012 regarding the ADR vehicle approval certificate

- Ordinance of the Minister of Transport, Construction and Maritime Economy of 25 April 2012 regarding the report on the control of the transport of dangerous goods by road
- Regulation of the Minister of Transport, Construction and Maritime Economy of 13 April 2012 on transportable pressure equipment

Transport of dangerous goods by rail

The carriage of dangerous goods by rail is governed by the Regulations for the international carriage of dangerous goods by rail (RID Regulations), which is Annex C to the Convention on International Carriage by Rail (COTIF), of which Poland is a signatory. The obligation to apply the RID Regulations also arises from Directive 2008/68 / EC of the European Parliament and of the Council on the inland transport of dangerous goods, which has been implemented into the Polish legal order by the Act on the carriage of dangerous goods.

A security adviser in the transport of dangerous goods is responsible for supporting activities to prevent threats to persons, property and the environment arising from the transport of dangerous goods. Any enterprise whose activities involve the transport of dangerous goods by rail or the packaging, loading, filling or unloading thereof is required to appoint such an adviser. The conditions that must be met to obtain the rights of adviser are detailed in the Act on the carriage of dangerous goods.

Regulations governing the carriage of dangerous goods by rail:

- Regulations on the international carriage of dangerous goods by rail (RID Regulations) (Journal of Laws of 2019, item 2281)
- Commission Directive (EU) 2018/1846 of 23 November 2018 adapting to scientific and technical progress annexes to Directive 2008/68 / EC of the European Parliament and of the Council on the inland transport of dangerous goods (Official Journal EU L 299 of 26.11 .2018, p. 58)
- Directive 2008/68 / EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods (Official Journal EU L 260 of 30.09.2008, p. 13)
- The Act on the carriage of dangerous goods (Journal of Laws of 2018, item 169)
- Ordinance of the Minister of Infrastructure and Development of 7 May 2015 on obtaining a consultant certificate for the security of the transport of dangerous goods (Journal of Laws of 2015, item 718)
- Ordinance of the Minister of Transport, Construction and Maritime Economy of August 14, 2012 regarding the form of the annual report on the activity in the field of transport of dangerous goods and the method of filling it (Journal of Laws of 2012, item 966)
- Ordinance of the Minister of Transport, Construction and Maritime Economy of 29 May 2012 on conducting courses on the transport of dangerous goods (Journal of Laws of 2012, item 619) as amended by the Ordinance of the Minister of Infrastructure and Construction of 23 February 2016. amending the ordinance on running courses in the field of dangerous goods transport (Journal of Laws item 315)
- Regulation of the Minister of Transport, Construction and Maritime Economy of 25 April 2012 on technical conditions for tracks for emergency parking of damaged railway wagons carrying dangerous goods (Journal of Laws of 2012, item 508)

When transporting dangerous goods by rail, the internal regulations of the infrastructure manager issued in accordance with the Rail Transport Act should also apply, including:
• Instructions on how to transport dangerous goods by rail

8.6.3. Slovensko

The issue of the transport of dangerous goods is described in point 6.11 for both road and freight transport. Given that such transport is carried out on the territory of Slovakia according to internationally valid laws, it can be said that the conditions are the same throughout the Tritia region.
In general:

- Rail transport of dangerous goods in the Slovak Republic in domestic and international transport of EU / COTIF countries is carried out according to the Regulations for International Carriage of Dangerous Goods by Rail (RID). The text of the RID is amended every two years by the adoption of amendments by the RID Expert Committee, replacing the previous version. The original official version of RID is in French with translations into COTIF - English and German.
- Transport of dangerous goods to / from SMGS countries through border crossing stations Čierna nad Tisou and Maťovce ŠRT is carried out according to Annex 2 to SMGS. The shipping document is the consignment note SMGS, resp. CIM / SMGS consignment note. The completion of the consignment note (NL) other than Annex 2 to the SMGS shall comply with the provisions of Annex 1 to the SMGS Agreement (point 8). When using NL CIM / SMGS, the provisions of Annex 6 to the SMGS Agreement (and its Annex 2) / GLV CIM / SMGS (Annex 2) shall be observed. The routing route for the carriage of consignments by CIM / SMGS consignment note shall be agreed within the meaning of point 14.3 of Annex 6 to the CIM / SMGS SMGS / GLV Agreement.
- Transfers after normal gauge to the CIM / CUV transport document can also be carried out via the Čierna nad Tisou border crossing station, in which case the transport is carried out according to RID and not according to Annex 2 to the SMGS.
- In road transport, dangerous goods are transported domestically and abroad on the basis of the ADR Convention, which comprehensively describes the obligations of all parties involved to ensure health protection throughout the transport process, given the nature of the goods being transported. This agreement also defines the essential characteristics of the contract between the consignor, the consignee and the carrier.
- When incidents involving the transport of dangerous goods occur, entities involved in the transport of dangerous goods, ie. the loading organization, the loading organization, the carrier or the consignee to manage the provisions of the ADR Agreement as set out in section 1.8.5 of the ADR Agreement. In the event of an accident involving the carriage of dangerous goods, the persons concerned must make an entry in accordance with 1.8.5.4. and, within one month, send to the competent authority, which in this case is the Ministry of Transport and Kits of the Slovak Republic, a report on incidents during the transport of dangerous goods in accordance with the RID / ADR Agreement.

The chosen route for the transport of dangerous goods is subject to approval procedure, due to the nature of the goods transported. At present it is possible to check the direction

of transport of dangerous goods on the basis of the vertical marking of roads in map form on the pages of the road database SSC.

8.7. Summary of the Chapter 8

Under OP Transport 2007 -2013 and 2014 - 2020, the Czech Republic supported the reconstruction of lines, roads, combined transport (infrastructure of sidings, also connected to KD terminals), transhipment mechanisms for KD terminals and purchase of intermodal KD units, ship modernization and port infrastructure, rail vehicle equipment ETCS, energy consumption measurement, brake blocks, ECTS line equipment, TAF TSI vehicles, etc.). Allocations for individual axes within the OP Transport 2007 -2013 - the railway allocated double the amount in comparison with road transport and in the period 2014 - 2020 it was in the ratio of 52: 48%. Combined transport had a small allocation of financial resources.
In the period 2007 -2013 On the territory of TRITIA some sections of the lines were reconstructed on the TEN-T lines and were equipped with the ECTS system.
In the period 2014 -2020 the reconstruction of railway lines continued, which were not completed in the period 2007 -2013. In the framework of the international corridors RFC 5 and RFC 9, some sections of lines and railway stations still need to be reconstructed (mainly the Petrovice u Karviné TSG, the Ostrava main junction, including neighboring sections - four-track railing to Ostrava Svinov). from Přerov including the construction of the KD terminal, linePomom - Suchdol n. O., BC, Dětmarovice - Petrovice u K., state border, line Dětmarovice – Mosty u Jablunkova, Ostrava - Petrovice u Karviné, line Ostrava Kunčice - Frýdek Místek - Valašské Meziříčí Construction of VRT Přerov - Ostrava and ETCS equipment of the Mosty u Jablunkova - Dětmarovice section are also planned.
The program for the support of KD under OP Transport 2014 -2020 was not very successful in terms of the number of applications for subsidies and most of the funds were transferred to water transport. Under OP Transport 2014 -2020, more projects were implemented in relation to the infrastructure of KD (terminals), their equipment with transhipment mechanisms and the purchase of intermodal units than in period 2007-2013. To a much greater extent, the infrastructure of the KD terminals, the purchase of transhipment facilities for the KD and intermodal units were carried out under the CEF financial instrument. The infrastructure of the KD terminal in Mošnov will be built in the TRITIA region in the future thanks to CEF.
The Supreme Audit Office audited the investments made in the reconstruction of water infrastructure (inland ports) and the modernization of vessels. He found that they did not bring the expected effect of moving goods from road transport to water.
In addition, it also audited the funds (including EU funds) spent on the deployment of ETCS and GSM-R systems on SŽDC's network. He criticized the delays in program implementation in practice, program indicators and tenders for suppliers.
Siding support programs and programs that enabled equipping vehicles with energy metering systems, operating on 25 kV / 50 Hz AC systems, equipping vehicles with ECTS and GSM-R, and brake blocks were successful.
In the years 2014 -2020 within the TRITIA region in the Czech Republic were built sections Nebory - Oldřichovice and Oldřichovice - Bystřice road I / 11, highway D1 in the section Přerov - Lipník nad Bečvou and highway D48 Fish - MÚK Rychaltice.
Poland was the most successful in drawing subsidies from EU funds and also had a significantly higher budget (allocation) under the OP Transport for individual priority axes compared to the Czech Republic and Slovakia. It had several programs enabling to draw

subsidies from EU funds, primarily for the reconstruction of railway tracks, roads, port infrastructure and railway infrastructure. OP Infrastructure i Środowisko, Poland Wschodnia, CEF and regional operational programs of individual voivodships.

Within the OP Infrastructure and Środowisko in 2007 -2013 and 2014 -2020, many more projects were carried out for the reconstruction of KD terminals and their equipment with transhipment mechanisms, and huge funds were used to purchase containers for swap bodies, swap bodies, intermodal trailers and locomotives. comparison with the Czech Republic or Slovakia.

In the years 2007 - 2013, the construction or reconstruction of the infrastructure of the Temporary Transport Infrastructure in the amount of 40 -50% of the total was supported. of eligible costs, purchase of wagons, locomotives, semi-trailers of 30% of eligible costs.

In 2014-2020, intermodal transport of max. 85%. However, in specific projects in the period 2017-2018, the construction or reconstruction of the infrastructure of the Temporary KD infrastructure was supported in the amount of 70 - 97% of eligible costs, and the purchase of semi-trailers in the amount of 65.63% - 81.25% of eligible costs. costs, purchase of cars for combined transport and locomotives in the amount of 81.25 - 96.88% of the total. of eligible costs.
In addition to the transport companies and transport operators of KD, the finance could also be drawn by companies that rent railway vehicles - locomotives and wagons, as well as forwarding companies involved in combined transport.
In the area of railway station reconstruction, PKP PLK could draw up EU subsidies of up to 100% of eligible costs for reconstruction of tracks and stations, other applicants up to 85%.
In the road sector, EU subsidies of 80% (for more developed regions) - 85% of eligible costs (for less developed regions) were allocated to individual buildings.
Under the CEF financial instrument, Poland drew funds for the reconstruction of railway lines throughout Poland. Poland is a leader in drawing subsidies from this program within the EU.

Within the framework of the Poland Wschodnia program, reconstruction of tracks in the area of eastern Poland, eg lines leading to PPS Brest / Terespol. The total investment will amount to about 16.3 billion zł.

Overall, however, it can be stated that some lines near the Czech border (eg line 93) in the direction further to Katowice will only be reconstructed. They are on the list of replacement projects, not in the base list, which has a higher priority. In the Katowice agglomeration, many lines from all over Poland are connected, with significant sidings of mines, metallurgical plants and manufacturing companies connected, and therefore these lines are overloaded. In addition, many tracks are still in poor technical condition, even within corridors. There are frequent changes in line speeds (drops from maximum speed).
Slovakia received the least subsidies under OP Integrated Infrastructure compared to the Czech Republic and Poland. In the years 2007 -2013 they drew funds for the implementation of projects by reconstruction of several railway lines, marshalling yard Žilina Teplička, modernization of PPS Čierna nad Tisou / Chop, per project. documentation of the KD Temporary Zilina in the amount of 85% of eligible costs. Significantly more money was allocated to road infrastructure than to railways.
In the framework of OP Transport 2014-2020, by the end of 2020, the DÚR had to be

prepared for the construction of the public terminal intemodal. transport in Bratislava-Pálenisko and Košice. Within the budget, 1/3 more funding was earmarked for road construction and reconstruction than for rail infrastructure.
The KD terminal in Žilina was completed in October 2015, but was not operated for 3 years. In order to avoid having to repay MDPT, the EU selected Metrans as the terminal operator in the tender.
Regarding railway lines, so in 2018, II. stage of modernization of the Púchov - Žilina line in the section Považská Teplá (outside) - Žilina (outside) for speeds up to 160 km / h.
Another project was the first stage of the modernization of the railway line Žilina - Košice in the section Liptovský Mikuláš - Poprad Tatry (outside), in the section Poprad - Štrba (Lučivná).
Within CEF, GSM-R was implemented in the ŽSR network, section Varín - Košice - Čierna nad Tisou at the border and implementation of technical interoperability for the TAF TSI subsystem in ZSSK CARGO.
By the end of 2020, the construction of the Žilina junction is to be completed, and the section of Čadca st. Hranice - Krasno n. Kysucou including railway station modernization. Trutnov. PD is being prepared for electrification of selected sections in the Košice region.
In the area of expressway construction in the TRITIA region, PD and construction of R5 Svrčinovec - št. hr. SR / CR.
In the area of water transport, improvement of navigability of the Danube waterway, modernization and construction of public ports in Bratislava and Komárno and implementation of modern technologies for ship and port traffic management and introduction of regular passenger transport on the Danube will be implemented.
Rail transport of dangerous goods between SŽDC, PKP PLK or ŽSR network in the direction from / to EU countries / countries participating in the COTIF contract is carried out according to the Code for International Carriage of Dangerous Goods by Rail (RID). The transport of dangerous goods from / to countries of the SMGS Agreement is carried out according to Annex 2 to the SMGS. Road transport of dangerous goods is carried out under the ADR contract.
In terms of the movement of goods between modes of freight transport, the most important will be the direction of the subsidy policy, whether in the investment or non-investment part, and the internalisation of external costs in transport. The amendment of the legislation for the transport of dangerous goods or oversized consignments will not achieve a significant share of the transfer of goods, only the safety of road transport will be increased. This is similar to the customs conditions where most goods are traded within the European Union. Thus, changes in the customs legislation cannot affect a substantial part of the goods transported in the TRITIA region.