Interreg CENTRAL EUROPE
European Union European Regional Development Fund

TRANS TRITIA

D.T2.1.2 Road to Inland Waterways Transfer of Shipment

02.2019

Road to Inland Waterways Transfer of Shipment

Responsible Partner:
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Content

1. INTRODUCTION

The study examines the possibilities and technical requirements for moving a part of freight transport in the TRITIA region from inland waterways, especially in the north-south direction, using the Odra waterway.

1.1. Definition of the area of interest

The area of interest is TRITIA region, ie economically and hence transport - very exposed area of the border territory of the Republic of Poland, the Czech Republic and the Slovak Republic. This region has an area of **34 069 km²** and has **7 885 000 inhabitants.**

There are two cities with about 300 thousand on its territory. The inhabitants - **Katowice** 312 thousand and **Ostrava** 294 thousand and other 15 cities with more than 80 thousand inhabitants - 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. (headquarters of regions highlighted in bold).

Figure 1 – Region Tritia

1.2. Project aim

The aim of the project is to improve coordination among freight stakeholders in order to increase environmentally friendly multimodal freight solutions. Resources include improving awareness, planning and coordination between regional authorities, transport managers and freight transport stakeholders. The project focuses on cross-border, transnational and interregional cooperation with a view to strengthening 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 the transfer of a significant part of the transport load from the transport of the products from the roads to the water transport.

2. EUROPEAN CONTEXT

2.1. EU 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 set out in this document are primarily to minimize the environmental impact of transport. In particular, Europe's dependence on oil imports should be reduced, while carbon emissions in transport should drop by 60% by 2050 in the context of increasing transport and promoting mobility. From the point of view of the importance of waterway transport to achieving these objectives, there is a substantial intention to transfer 30% of road freight 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. TEN-T

"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)" does not explicitly include the Odra waterway, but some of the principles contained in it are indicative.
For example, it is a paragraph (31): "The trans-European transport network should, by far, provide a basis for the large-scale deployment of new technologies and innovations, which can, for example, contribute to increasing the overall efficiency of the European transport sector and reducing its carbon footprint. From the point of view of purely transport, paragraph 32 can be mentioned: "The trans-European transport network must ensure efficient multimodality in order to enable passengers and goods to have a better and more sustainable choice between modes of transport and to allow the consolidation of large volumes transported over long distances.

2.3. AGN

The European Convention on Main Inland Waterways of International Importance (AGN) defines decisive waterways and ports in Europe. The Contracting Parties have adopted the provisions of this Agreement as a coordinated plan for the development and construction of a network of inland waterways called the "Inland Waterway Network of International

Importance" or "E Waterway Network" which they intend to implement under their respective programs. The Slovak Republic approved the agreement on 2 February 1998, and the Republic of Poland acceded to the agreement on 17 March 2017.

Figure 2 AGN – European Inland Waterways (https://www.unece.org/fileadmin/DAM/trans/conventn/agn.pdf)

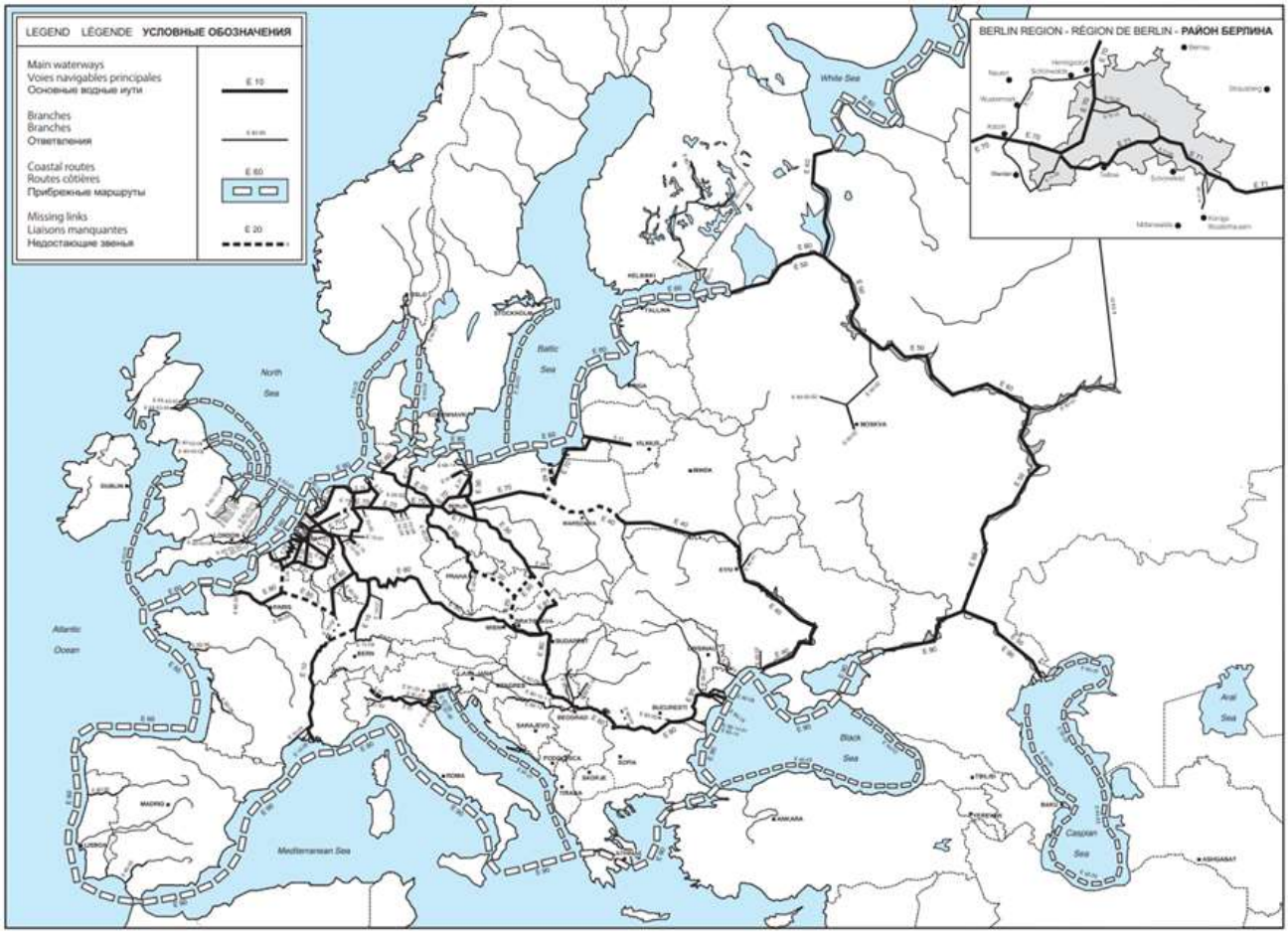


Table 1 – Classification of the European Inland Waterways, east of Elbe(www.wikipedia.org)

Class	Tonnage (t)	Length (m)	Breadth (m)	Draught(m)	Air Draft(m)
I	180	41	4.70	1.60	3.00
II	500-630	57	7.50-9.00	1.60	3.00
III	470-700	670-70.0	8.20-9.00	1.60 - 2.00	4.00
IV	1.000-1.500	80.0-85.0	9.50	2.50	5.25 / 7.00
Va	1.500-3.000	95.0-110.00	11.40	2.50-4.50	5.25 /7.00 / 9.00 / 10.00
Vb	3.200-6.000	172.0-185.0	11.40	2.50-4.50	
VIa	3.200-6.000	95.0-110.0	22.80	2.50-4.50	7.00 / 9.00 / 10.00
VIb	6.000-12.000	185.0-195.0	22.80	2.50-4.50	
VIc	9.600-12.000	270.00-280.00	22.80	2.50-4.50	9,10
	9.600-12.000	195.00-200.00	33.00-34.20	2.50-4.50	
VII	14.500-27.000	285.00	33.00-34.20	2.50-4.50	

Values for Oder waterway are highlighted by yellow color

2.4. Low carbon economy

The document "A Roadmapfor moving to Competitive to Low Carbon Economy in 2050, COM (2011) 112 final", contains above all the intention to keep climate change below + 2 ° C. In essence, the reduction in greenhouse gas emissions by 2050 is by 80-95% compared to 1990. Of course, these plans also concern transport.

2.5. Smart and sustainable growth

The document entitled "A strategy for smart, sustainable and inclusive growth, COM (2010) 2020 final", contains five main objectives. They define what the EU should achieve by 2020. One of these targets relates to climate and energy. The Member States have committed themselves to reducing greenhouse gas emissions by 20% by 2020, increasing the share of renewable energy in the EU's energy mix to 20% and achieving the 20% improvement in energy efficiency. Subsequently, the EU summit on 23 and 24 October 2014 brought the agreed targets by 2030 (30% reduction in CO2 production, 30% renewable sources, 27% energy efficiency improvement). In the EU's winter energy package of 30 November 2016, it is proposed to increase energy efficiency by 2030 by 30%. This target is unlikely to be achieved without major changes in transport - ie greater use of less energy-intensive water and rail transport.

3. NATIONAL CONTEXT

Of course, all participating states also have their national documents, which respond to the current and prospective state of the waterways and to the relevant European documents.

3.1. Poland

The title of the document: **STRATEGY FOR RESPONSIBLE DEVELOPMENT (2017)**
The purpose of the document: The development path leading to sustainable development of the country is based on economic development determined by: innovations and knowledge Intensive investments and savings; fuller use of human resources and territorial potentials; quality of institutions and of the law to create optimal conditions for economic growth. The Strategy defines a new model of development up to the year 2020 and in the perspective up to the year 2030. New development model increased responsibility of state institutions for designing economic, social and territorial processes.
Strategic objective / priorities in the context of the development of international freight transport Main objective: Creating the conditions for the growth of income of the Poles with the increase in the social, economic and territorial cohesion.

Specific objective I. Sustainable economic growth based on the existing and new advantages. Specific objective II. Socially and territorially sustainable development. Specific objective III. Efficient State and economic institutions supporting the social and economic growth and inclusion Sectoral issues necessary to achieve the objectives of the Strategy: Human and social capital, Digitization, Transport, Energy, Environment, National security.
Directions of activities / projects relating to the development of international freight transport, particular in the surveyed region concerned by the document (if specified) The main goal related to the TRITIA project: Increasing transport accessibility and improving the conditions of providing services related to the transport of goods and passengers. One of the priority activities up to 2030 is to link Poland to the TEN-T core network corridors: the Baltic - Adriatic and the North Sea - Baltic. The undertaken investments will concern all types of transport (road, rail, inland water, sea, air). In particular, this applies to: completing the construction of a motorway and expressway system; modernization of the railway network, including traction and level crossings; reconstruction of the transport possibilities of waterways (parameters of the IV class of navigability) - on selected, economically and ecologically justified sections.

The title of the document: **NATIONAL SMART SPECIALIZATION IN POLAND**
The purpose of the document: The result of the National Smart Specialisation in Poland will be areas of smart specialization on the national level, along with a mechanism for reviewing and updating the selection in progress.
Strategic objective / priorities in the context of the development of international freight transport The document indicates 19 national smart specializations
Directions of activities / projects relating to the development of international freight transport, particular in the surveyed region concerned by the document (if specified) KIS 9. ENVIRONMENTALLY FRIENDLY TRANSPORT SOLUTIONS I. Innovative means of transport II. Proecological construction solutions and components in means of transport III. Transport management systems IV. Innovative materials in means of transport V. Innovative technologies of production of transport means and their parts

The title of the document: **TRANSPORT DEVELOPMENT STRATEGY UP TO 2020 (WITH PROSPECTS UNTIL 2030)**

The purpose of the document: It is a mid-term planning document that is an integral part of a coherent system of managing national strategic documents. It indicates the goals and directions of transport development in such a way that, by 2030, it would be possible to achieve the goals set in the Long-term National Development Strategy (DSRK) and the Medium-Term National Development Strategy (NDS 2020).
Strategic objective / priorities in the context of the development of international freight transport The basic objective of the national transport policy is to increase territorial accessibility, improve the safety of road users and the efficiency of the transport sector by creating a coherent, sustainable and user-friendly transport system in the national (local), European and global dimension.
Directions of activities / projects relating to the development of international freight transport, particular in the surveyed region concerned by the document (if specified) The implementation of the main transport goal in the perspective of 2020 and beyond, is associated with the implementation of five specific objectives, appropriate for each of the transport branches. It is about: creating a modern and coherent network of transport infrastructure, improving the organization and management of the transport system, improving the safety of traffic users and transported goods, limiting the negative impact of transport on the environment, building a rational model of financing infrastructure investments.

3.2. Czech republic

3.2.1. Government resolution ČR č. 368/2010

The Government Resolution of the Czech Republic of May 24, 2010 No. 368 "on the design of the method of further territorial protection of the Danube-Oder-Elbe Canal Corridor" reads as follows:

Government

I. approves the proposal for the method of further territorial protection of the Danube-Oder-Elbe Canal Corridor through the Territorial Reserve in the Territorial Planning Documents until the Government's Decision on Further Progress, contained in Part III of the Material File no. 353/10;

II. requires the members of the Government and the heads of the central administrative authorities to proceed to the territorial protection of the Danube-Oder-Elbe Canal Corridor in accordance with point I of this resolution.

Based on this resolution, the Danube-Odra-Elbe waterway corridor was captured in the Territorial Development Principles of the Ústecký, Středočeský, Pardubický, Královéhradecký, Olomoucký, Moravskoslezský, Jihomoravský and Zlínský Regions.

3.2.2. Transport policy ČR for perion 2014-2020 with a view to 2050

- Approved transport policy (Government Resolution No. 449 of 12 June 2013) accepts all the decisive documents and intentions of the European documents. Therefore, all

the considerations and calculations contained in the chapter on relevant European documents are fully compatible with the Czech Republic's Transport Policy.

The following is the attention:

- Regulation of night road freight traffic;
- Inland waterway support under the Naiades and Naiades II programs;
- Ensure the operation of rail freight corridors - to modernize by 2030;
- Ensure the transit of large railway junctions;
- Expanding regular multimodal freight transport lines;
- Internalize external costs as a source of transport infrastructure financing.

3.2.3. Transport sectoral strategies 2. phase

The transport sectoral strategies of the 2nd phase were approved by Resolution of the Government of the Czech Republic No 850 on 13 November 2013. The strategy deals with scenarios of future development, transport forecasts, identification of measures for the development of transport infrastructure, financial possibilities and implementation of transport sectoral strategies. For Inland Waterway Operations (excluding D-O-L waterway) 2050 compared to 2010 - 100% are considered: 271% - 234% - 146% (high, medium and low scenario).

For waterways, 101 investment measures have been identified.

3.2.4. The concept of freight transport for the period 2017-2023 with a view to 2030

This document was adopted by the Government of the Czech Republic by its Resolution No. 57 of 25 January 2017. The text analyzes in detail the freight transport market, the preconditions for its further development and the implementation of the relevant European documents. The annexes also define suitable regions for the location of terminals for continental combined transport and the position of neutral (public) terminals of multimodal transport. From the point of view of the structure of the needs of freight transport, it also analyzes the assumptions for the objective set out in the White Paper, namely the transfer of 30% of current road freight over 300 km in the EU to rail or water transport. It is noted that the Czech Government has also signed the European Commission's Decision No. 978/2015 to move 30% of road freight over 300 km to rail or water by 2030.

<u>Selected measures:</u>

• ensuring interoperability, charging harmonization;
• support for routes for oversized transport;
• support for multimodal transport and combined transport;
• the reliability of the waterway and the port network for freight;
• greater use of rail and waterways at greater distances;
• connection of Ostrava to the Odra waterway, feasibility study D-O-L;
• extension of river ports with an area of up to 50 km;
• connection for manufacturers of oversize products to river ports;
• internalization of externalities;
• liquefied gas in road and water transport;
• support for public transport combined terminals

3.3. Slovakia

Development of water transport in Slovakia

The development of water transport in the SR including waterways and ports is elaborated in documents of the Ministry of Transport and Construction of the Slovak Republic (MDaV SR):

• The Concept of Development of Water Transport of the Slovak Republic, which was drafted in 2000 and subsequently updated,

• Strategic Transport Development Plan of the Slovak Republic until 2030 - Phase II elaborated in 2016.

While the first document MDV SR considers connecting the Váh River to the Odra River (linking Váh with Odra is understood as the interconnection of magistral inland waterways within the meaning of the European Agreement on Main Inland Waterways of International Importance), the second document shows the Váh float only to Žilina.

4. WATERWAYS IN EZUS TRITIA

The chapter extends the basic description that was made in the section D.T2.1.1 - Inland waterways system at TRITIA area.

4.1. Oder watewrway

4.1.1. Historical contexts

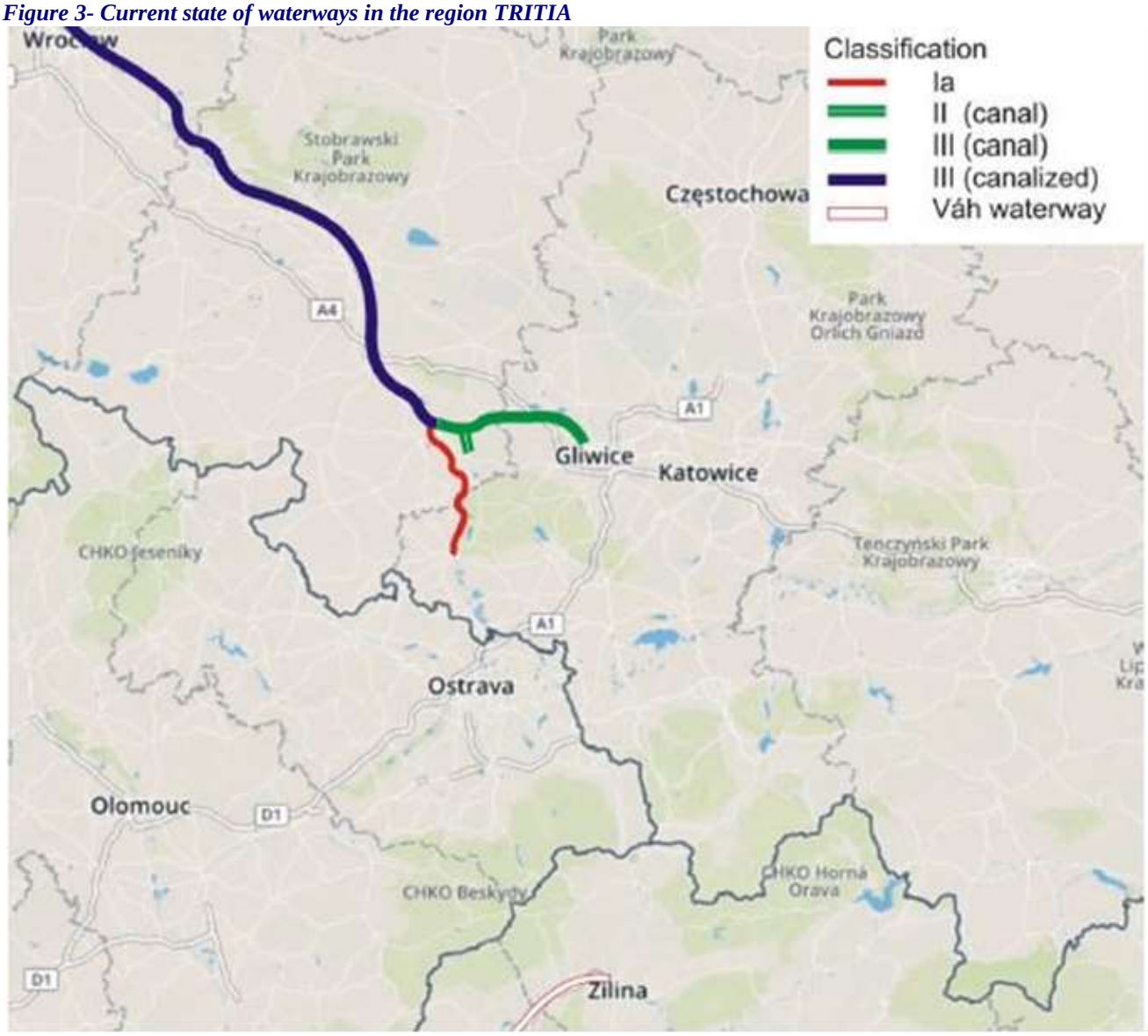
Systematic care for the navigability of the Odra is dated by a historically important document called the Bohumín Protocol of August 9, 1819. This document, based on the conclusions of the Vienna Congress (1815), pledges Prussia to ensure the navigability of the Odra (until then the states were not guarantors of this activity) and at the same time sets the desired parameters. While the parameters and intensity of work varied over time, the work needed was essentially continuous. A certain exception was the period of socialist governments, with water transport in all countries with this political system in a partial downturn.
To illustrate, while in the so-called old EU countries (E-15) the share of inland navigation in total outputs is equal to about 10.5% over the long term, the so-called new EU countries (E-13) 2.9%. Particularly noteworthy is the comparison of the two German states from 1955 until the time before their merger - separate data are available until 1988. According to statistics *Statistisches Jahrbuch für die Bundesrepublik Deutschland* was about 19% long (even here in the period 1955-1988 the increase from 18.4% to 19.5%, with the increase in transport performance in total 2.7x). In the same period, inland navigation performance in total transport performance in the German Democratic Republic decreased from 8.4% to just 1.3%. A similar process has been met by the countries participating in the project - Poland and the Czech

Republic now reach a share of 0.1% (2014), in the Slovak Republic thanks to the Danube 3.3%.
The decline of the sailing in so-called socialist countries was undoubtedly affected by the delay in the construction and modernization of waterways, which unfortunately continued to the present: in 1995-2015, the navigation network in the "old" countries (E-15) grew by 10.6 %, in "new" countries (E-13) only 2.6%. (*Statistical Pocketbook 2017*)
Debts on the quality of waterways are, of course, still related to the Odra in both Polish and Czech territory.

4.1.2. Current state and perspective

Present status of waterways at TRITIA area decribes next map:

Figure 3- Current state of waterways in the region TRITIA



In recent years, there has been a growing interest in all participating countries (Poland-Czech Republic-Slovakia) to improve the unsatisfactory state of waterways as well as their

use - partly in the light of the relevant EU intentions (see above) as well as understandable efforts to improve living conditions economic conditions.
An important step forward was the signing of AGN (the Agreement on Major Waterways of International Importance) by both the Czech Republic and the Republic of Poland. On this basis, Poland can request the inclusion of the Odra Waterway to the Trans-European Transport Network (TEN-T), which was already attempted in 2011. In parallel, the Czech Republic may apply for inclusion of the Czech part of Odra in connection with the application for inclusion of the Danube-Oder-Elbe. These actions are essential in terms of co-financing from European funds. The revision of the existing text of the TEN-T will take place on 31 December 2023, but this implies a good and vigorous preparation already in 2019-2021.
Preparation in the Czech Republic consists in the preparation of a feasibility study for the water corridor D-O-L, which is currently finalized (June 2018). For the Odra waterway, the feasibility study is being prepared in Poland in the near future.
In Poland, a wider development of waterways is envisaged, not only through the establishment of a specialized Ministry of Maritime Economy and Inland Navigation (MGMi), but also by the adoption of an important government document (UCHWAŁA Nr 79 MINISTRY OF THE COUNCIL of 14 October 2016 on the implementation of the "Założeń do planów rozwoju śródlądowych dróg wodnych w Polsce na lata 2016-2020 z perspektywą do roku 2030 ").
In light of these steps, it is possible to expect substantial work on the Odra waterway in the next decade.
The main task is to extend the Odra waterway to the Czech Republic and to remove the existing deciding bottlenecks. Planned class Odra waterways according to Polish intentions class Va. The basic narrow throat is the section of the Odra from Widuchov to Kozle, where it is necessary to rebuild from class II and III to class Va and the strategic narrow throat is between Szczecin and Widuchov where it is also assumed to be converted from class IV to class Va.
The above-mentioned Polish government document is the priority of I. Oderska vodní cesta (E-30), where the objective of achieving the required class of international navigability and connection to the European waterway network is defined as follows:
• Removing botlenecks;
• Modification of the Odra waterway to Class Va parameters;
• Construction of the Polish section missing the Danube-Oder-Elbe;
• Construction of the Silesian Canal.

4.2. Channel Gliwicki

4.2.1. Historical contexts

Historically, the Gliwice Channel has its origin in the channel Kłodnickim. Channel, which from the beginning of the 19th century to provide an efficient and cheap transport of upper silesians raw materials and products, at the end of the century began to lose importance. The growing demand for transportation of goods (Oder) resulted in the introduction of shipping units with higher tonnage and dimensions exceeding the parameters of the

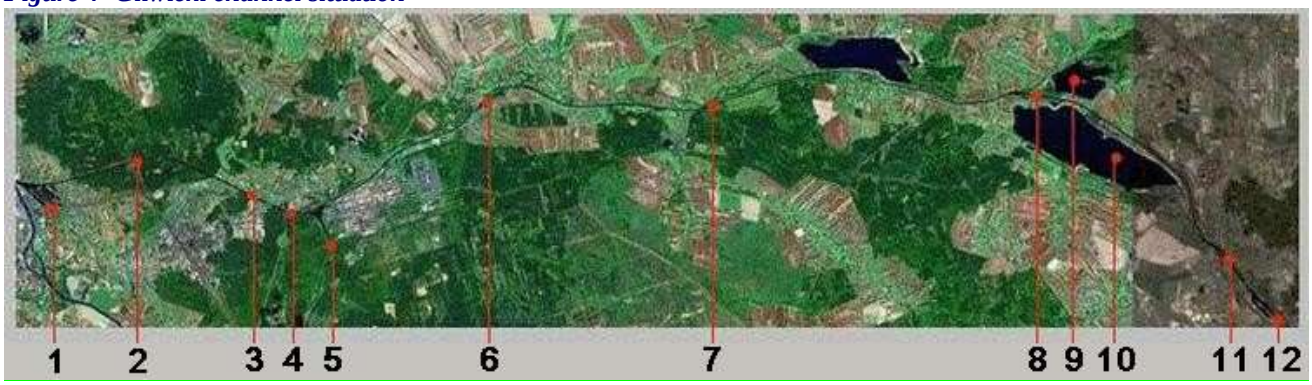
channel Kłodnicki. The need for transshipment of goods from barges in the channel to oder increased its transport time and costs and adversely affect the final price of the products. The initial, preparatory works related to the construction of the Gliwicki Channel started in 1933, Competent work on the construction of the Canal began in the spring of 1934.The route of the channel have been routed in the trench or embankment by the sandy and unstable, therefore, trough with a layer of clay. Have been limited in this way, the loss of water resulting from a leak, and for the protection of the insulation layer introduced absolute prohibition of anchoring all units. This ban is up to date. The instability of the land and flood were over two years (1940-1941), the cause of two major building disasters in the Long and Dzierżnie. Shipping capacity was obtained only in 1941 onwards though the official opening of the channel took place 8.12.1939, near locks were built also anti-aircraft shelters. Have been preserved until today, unused, at most as a handy magazine. With the construction of the Canal has been pursued other investments to facilitate transport from and to the port. The highway was built (a major investor was German railways), in 1939 r brought to the port railway line. To the year 1942 was built a number of bridges, including the railway bridges. Very few all are used to today, and along with the arising after the war, there are currently 18 bridges (4 railway). Special attention deserves “przepust syfonowy” for Klodnica river colloquially called Klodnica sifon. It is one of two places in Poland where intersect two watercourses without collision. Kłodnica flows about 4 meters under the channel. Klodnica siphon is located about 800 meters below the lock No 2 in Nowa Wes.
Nearby, the abutments of the bridge in Lenartowice, unfinished during the war, have survived. It was predicted that the ship tonnage will be 1000 tons, but never so large ships was operated. Currently, pushed sets are floating - 500 T barge + pusher. In 1970, the Kędzierzyński Canal, approximately 5.6 km long, was opened, connecting the Gliwicki Canal with Zakłady Azotowe in Kędzierzyn-Koźle. One port pool. Until 1983, fertilizers were transported there. It is currently open to shipping, but not used. Originally the waters of Kłodnica fell into the canal in two places - part of the water at the height of the port basin No. 3 in Gliwice (designed for reloading of chemicals), the rest below the lock in Łabędy. Due to the significant pollution of the Kłodnica River, which could have caused the Gliwice Channel to be silted, the water was directed to the clarifiers, and then through the weir and canal passing under the bottom of Kłodnica and present street Portowa to the open supply channel. Still in the sixties of the last century, the weir was renovated and the clarifiers cleaned. The sludge extracted was basically a coal sludge, therefore it was planned to launch a small briquetting plant. The idea was not realized and the weir was ruined. A little further is the weir on Kłodnica, which, by stacking the river's water, affects the water level in the harbor.On the right bank of Kłodnica there is a second, smaller weir that gives rise to the feed channel and enables the regulation of the water flow. The outlet of Kłodnica to the channel below the lock was closed when in 1963, on the area of the former filling sand mine, the Dzierżno Duże reservoir was created, collecting the water of the Kłodnica river and three smaller streams. The reservoir's surface - 5.16 km2, capacity - 94 million m3. The mouth of the Kłodnica Canal may be opened at the time of flooding. Such an event took place in 1997. The amount of Kłodnica water, taking into account losses due to evaporation, seepage and slackening, was not sufficient to ensure its proper level in the Gliwicki Canal. In 1938, the Dzierżno Małe water reservoir was created with an area of 1.4 km2 and a capacity of 10 million m3 that accumulates the waters of the Drama River. Before the tributary of Drama, a system of weirs was built into the reservoir, allowing any direction of the river's water either to the Gliwice Channel above the Dzierżno lock or through the reservoir to the channel below the lock. It was also possible to supply both sections simultaneously. Currently, the whole of Dramy waters flows through Dzierżno Małe to the

channel below the lock, and the upper section is not supplied. Up to now, weirs and a pumping station have been preserved near the Gliwicki Canal. Float-controlled pumps were activated automatically and prevented flooding of the surrounding areas by waters mainly from seepage of the channel and reservoir.

4.2.2. Current state and perspective

The Gliwicki Channel (called Górnośląskie) is an artificial inland waterway of III navigability class. It starts at km 98.1 of the Odra river, on the border of the third basin of the Koźle port, and ends at the port of Gliwice. The length of the canal is 41.2 km, of which 600 meters is the port basin in Gliwice. The difference in the water level between the ports of Koźle and Gliwice is 43.6 meters. This difference allows overcome six two-chamber sluices with twin chambers. All sluice chambers have the same dimensions: 12 m wide and 72 m long.

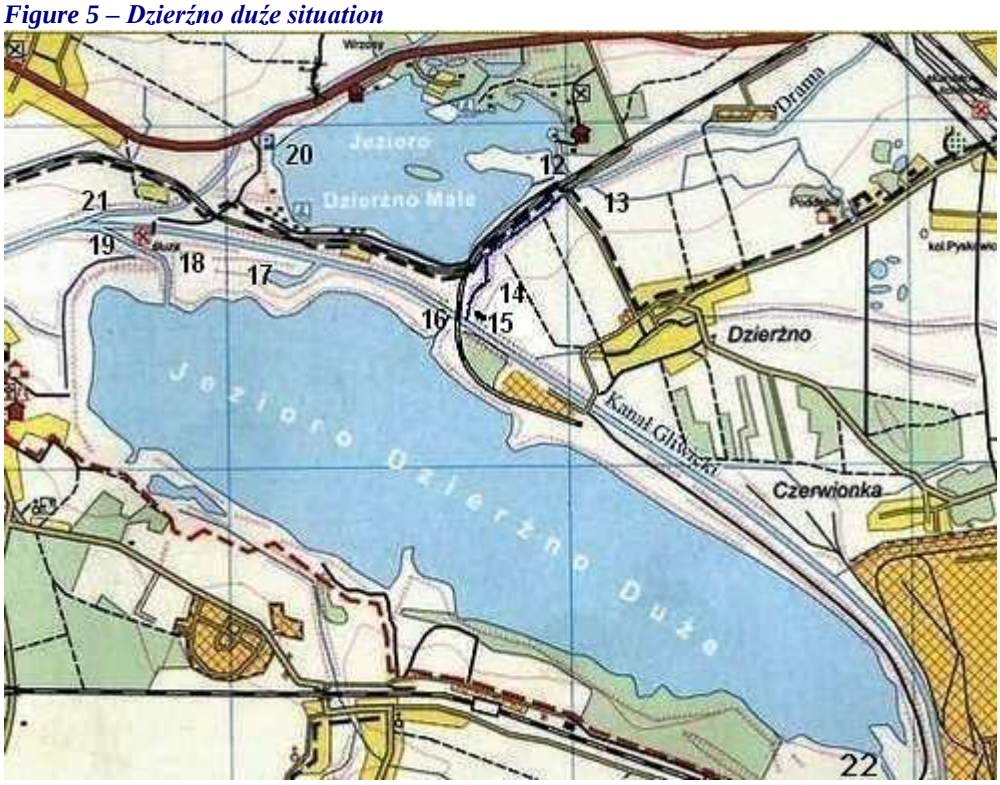
Figure 4- Gliwicki channel situation



1 Port basins in Koźle
2 Lock No. 1 - Kłodnica
3 Kłodnica siphon
4 Lock No. 2 - Nowa Wieś
5 Kędzierzyński Canal
6 Lock No. 3 - Sławięcice
7 Lock No. 4 - Rudziniec
8 Lock no. 5 - Dzierżno
9 Reservoir Dzierżno Małe
10 Reswrvoir Dzierżno Large
11 Lock No. 6 - Łabędy
12 Port basins in Gliwice.

At present, Kłodnica flows through Dzierżno Duże, flows into the channel below the lock, and after Pławniowice it will return to its own channel by Jaz Pławniowice.

Figure 5 – Dzierźno duże situation



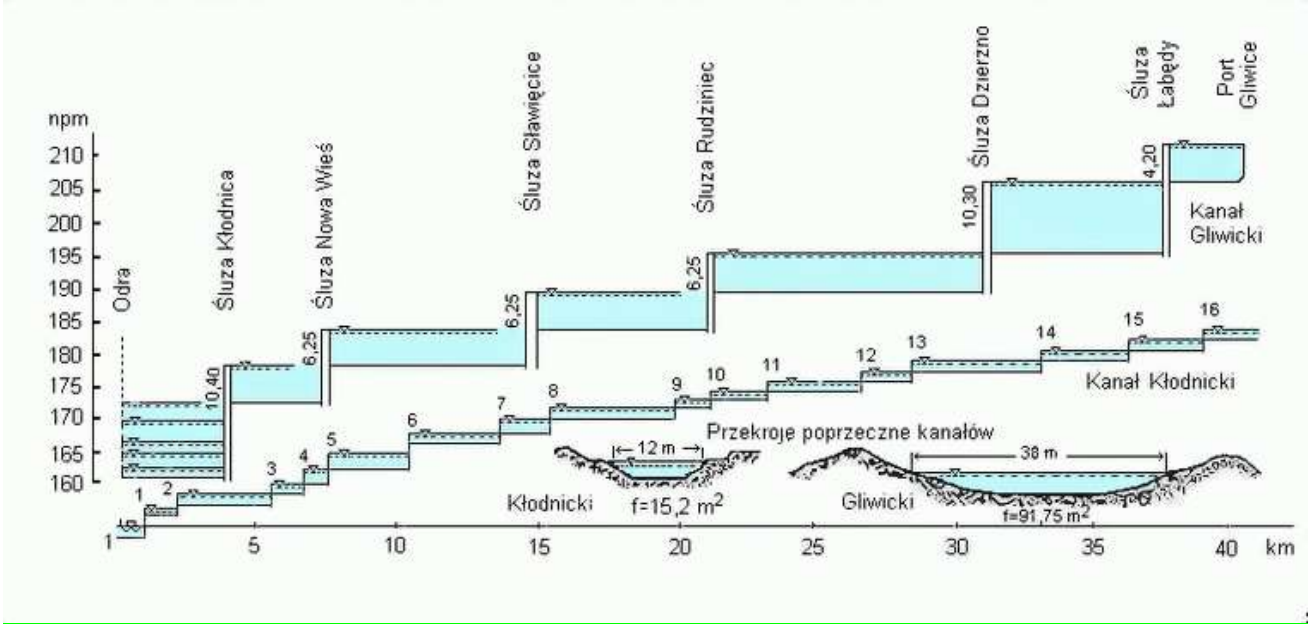
12 Drama's outlet to Dzierżna Mały
13 Weir at the mouth of Drama
14 Channel supplying Section 5 of the Gliwicki Canal (unused)
15 Pumping station
16 Weir 5 - between the canal and Dzierżno Duży
17 A fragment of the old weir canal
18 Breakthrough Kłodnicy - weir
19 The channel feeding section 4 of the Gliwicki Canal
20 Estuary of waters from Dzierżno Mała - weir
21 Estuary the Drama to the Gliwicki Canal
22 Estuary Kłodnica to Dzierżna Duża

The sequence of locks counted from the beginning of the channel.
The original depth of 3.5 m, due to silting, is currently not maintained and ranges from 1.8 to 2.7 m. The canal is led partly in a trench, partly in an embankment and has a width measured in the water table from 38 m (in the excavation) to 41 m (in the crown). Width at the bottom - 20 m. Due to the low bridges, the height of the vessel along with the load, measured from the water level, can not exceed 4.00 meters. The speed of barges moving on the channel is limited to 6 km / h. An absolute ban on anchoring is obligatory.

Table 2 – List of Channel Gliwicki locks

No	Lock name	Position [channel km]	Gradient [m]	Bottom closure	Upper closure
1	Kłodnica	3,63	10,40	Slider Stoney'a	Segment
2	Nowa Wieś	7,80	6,20	Gates	Gates
3	Sławięcice	15,19	6,25	Gates	Gates
4	Rudziniec	21,55	6,25	Gates	Gates
5	Dzierżno	30,89	10,30	Slider Stoney'a	Segment
6	Łabędy	38,51	4,2	Gates	Gates

Figure 6 –Longitudinal section of Channel Gliwicki locks



PORTS

The GLIWICE PORT, at the disposal of the Silesian Logistics Center, covers an area of 47.6 ha and has warehouses, storage yards, a railway siding, a petrol station, office rooms and parking for trucks. There are also two port basins. In one of them, until 2012, the barges carrying coal to the combined heat and power plant in Wrocław were being loaded.

PORT KOŹLE is one of the largest inland ports in Europe. At the beginning of the nineties, he was municipalized. Occasionally it was leased to shipping companies, and since 2004 it has been unused and deprived of any infrastructure. In 2014, a multi-variant development plan was developed and the port's historical importance in international trade and transport was restored.

The Gliwicki Channel, connecting Upper Silesia with the Oder River, was opened for shipping in the first days of April 1941. The route's administrator is expecting this year to further increase the number of boat-crossing vessels - this is the effect of ongoing modernization of subsequent locks on the canal. The Gliwicki Canal, also called Upper Silesia, is the only one in the country. From the 1930s, it connects Upper Silesia with the

Oder. Six locks on the 42-kilometer section between Gliwice and Kędzierzyn-Koźle ensure transport and tourist transport. The historic locks, enabling to overcome the difference in water levels, have been gradually modernized in recent years - the total cost of the work carried out reaches 123 million PLN.

The trail, along with transport barges, also benefits water sports enthusiasts who appreciate the tourist values of the Gliwicki Canal. In the previous navigation season, the channel overcame over 12,000 vessels, while two years earlier, 5,000 of them were The expected further development of shipping is possible due to the modernization of the infrastructure. Works on the locks of the Gliwicki Canal are underway in Łabędy, Dzierżno, Sławięcice and Nowa Wieś. Three years ago, the waterway administrator completed modernization of facilities in Rudziniec and Kłodnica. The entire work has received EU co-financing from the Cohesion Fund, under the Operational Program Infrastructure and Environment 2014-2020. Investments with a total value of nearly PLN 123 million are carried out so as not to prevent shipping. (PAP)

4.3. Channel Slazski

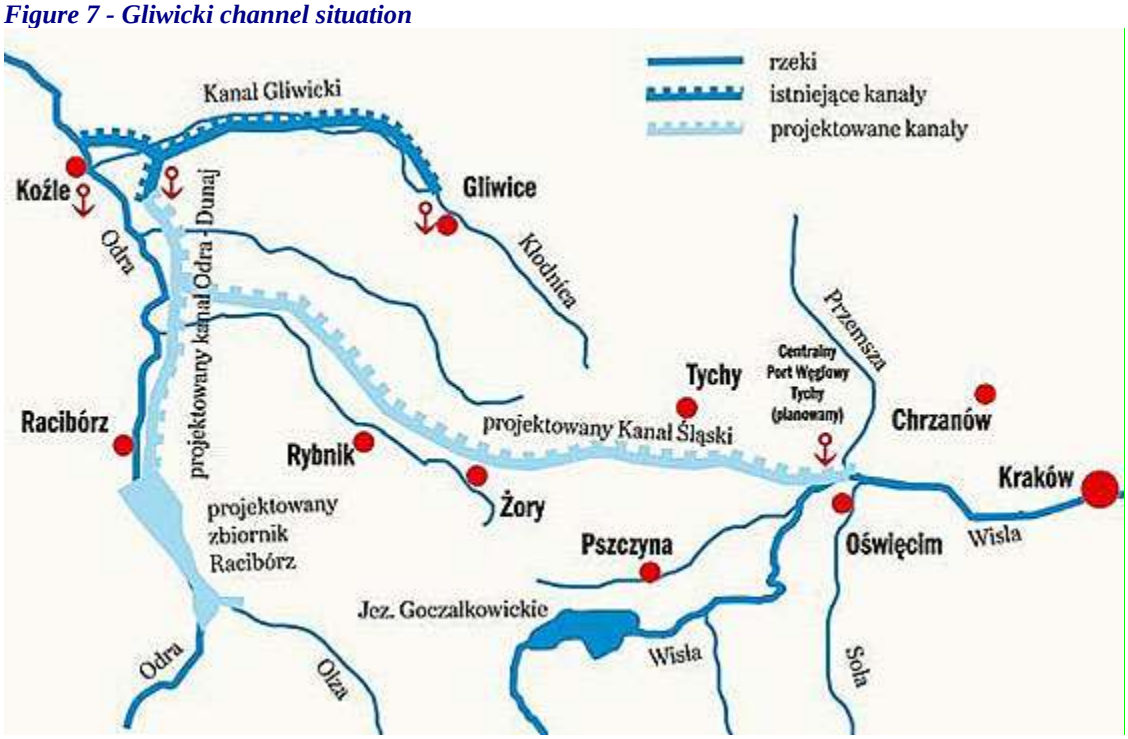
4.3.1. Historical contexts

The Vistula has been used by shipping for centuries. At the beginning of the twentieth century, work began on the construction of a shipping channel, called the Galician channel or the Małopolska channel. It was also an element of the future Danube waterway - Oder - Wisła - Dniester. The investment was interrupted by military operations. After the First World War, the reborn Poland modified the concepts of shipping routes. In 1926, the League of Nations experts acting on behalf of the Government of the Republic of Poland voted for the promotion of the Vistula. All activities were again interrupted by another world war. After the Second World War, the concept of the Upper Vistula cascade was created (from the mouth of Przemsza to the estuary of the San River). Finally, after a half-century building period, the concept of the upper Vistula cascade was implemented only on the section from Oświęcim to Kraków (Przewóz), through the construction of six water stages. The Waterway of the Upper Vistula, built within half a century, is in fact an "isolated" part of the waterway. From the lock of the water level Dwory, to the sluice of the water section Przewóz. The Waterway of the Upper Vistula is "blind" from one side and the other. Finally, the route of the Silesian Channel was selected as a branch from the Odra-Danube Canal through the Ruda River valley in the Odra basin and further through Gostynka in the Vistula basin. On June 16, 2016, Józef Pilch, the voivode of Lesser Poland, signed an agreement with a Chinese company, which was supposed to be responsible for opening the inland routes and the construction of the Silesian Channel. He expressed the assumptions of the work of the government, which has plans for construction of a canal connecting the Vistula and the Oder. The voivode agreed with the Chinese company China Harbor Engineering Company Ltd. (CHEC). The company was to be responsible not only for construction works, but also for financing part of the investment.

4.3.2. Current state and perspective

There are several strategic options for the development of the Silesian Channel. There are no reliable data for indicating prospects until 2030.

Figure 7 - Gliwicki channel situation



The construction of the channel is included in the Sustainable Development Strategy of Prime Minister Morawiecki. Local governments can propose its course in their area. Local governments can take advantage of this and propose a favorable channel course for themselves. Similar consultations take place on the channel connecting Ostrava with Kędzierzyn (via Racibórz).
It should be emphasized that the construction of the Silesian Channel is one of the priorities of the Polish government, expressed in the Council of Ministers adopted on 14 June 2016. 'Assumptions for plans for the development of inland waterways in Poland for 2016-2020 with a perspective up to 2030' (MP from 2016 r., item 711) "- the ministry's message.

The Ministry of Maritime Economy and Inland Navigation begins work on economic analyzes, which will be used in the feasibility study for the Odra Waterway. They will also be used to prepare the necessary documentation for the construction of missing inland waterways, which include the Polish section of the Danube-Oder-Elbe connection and the Silesian Channel.
The feasibility study will be the basis for making decisions regarding, among other things, the selection of optimal variants of the course of the investment route and the schedule of works implementation. The study will also allow for an optimal selection of financing forms for individual investments.
Therefore, at the current stage one can not unambiguously determine the form of investment implementation and its potential financing. The Ministry of Maritime Economy and Inland Navigation is actively looking for sources of project support. As one of them, funds under the so-called The Juncker Plan, and the construction of the Silesian Canal was reported on the List of potential government projects for support under the European Fund for Strategic Investments. The validity of such a concept will be determined by the results of

economic research, which will form the basis for discussions with the European Investment Bank. Dohn

4.4. Vah waterway

Váh is the largest and at the same time the longest Slovak river (403 km). Its catchment area occupies up to 34% of the territory of Slovakia (49 035 km2). It originates in Liptov as a southern and white belt near the village Kráľova Lehota at an altitude of 665 m. The White Váh is springing up in the High Tatras in the Glacier's Green Zelez kary on the southeastern side of Kriváň at 2026 m. The Black Váh is springing in the Low Tatras in the northern Králova hole boiler at 1670 m. The White Váh flows southwest, Black Váh northwest to the west and Kráľová Lehote are connected. From the confluence to the mouth we speak only of Vah. From the confluence to Vrútky flows mostly westwards, then northwest to Žilina. In this upper part it flows through relatively narrow valleys with more distinct rivers between Ružomberok and Krpeľany and between Lipovec and Strečno. The valleys are extended to larger basins (Liptov, Turcian and Žilinská). Under Žilina it suddenly turns and then continues to the south-west direction to Nove Mesto nad Vahom. In this central part it flows through the wider valleys with straits from Žilina to Horný Hričov and from Považská Bystrica to Nosice. From the Nové Mesto nad Váhom, the direction turns southwards, from Serede to the southeast and at Komarno at 106 m. it flows into the Danube. In this lower part, it flows up to the mouth with a mostly flat territory.
The longitudinal profile of the scales decreases progressively from the source to the mouth. The upper part has an athistoric character with a slope above 10 ‰. From the confluence of White and Black Váh to Bula, the average slope is about 4 ‰, from Belá to Orava 3.6 ‰ and from Orava to Kysuca 2.1 ‰. In the section from Žilina to Piešťany, it is between 2 - 1 ‰, from Piešťany to the mouth of 1 - 0.1 ‰. The Váh river basin borders on the north with the rivers of the Visla and Odra rivers, on the west with the Morava river basin, in the south with the sub-basin of the Danube, the upper part with the Hron basin, the east with Poprad and Hornad, the lower part with the Nitra River. Larger and more significant right-hand tributaries are Belá, Orava, Kysuca, Vlára and Malý Dunaj, left-side Boca, Revúca, Ľubochnianka, Turiec, Rajčanka and Nitra.
The hydrogeological ratios of the Váh river basin are relatively favorable from the water point of view. From Slovakia's streams, Váh has the largest catchment areas in the mountainous areas with the most frequent precipitation. The upper and middle part of the basin has sufficient groundwater reserves and is rich in the occurrence of springs of varying heights. The occurrence of high and medium springs is characterized by the entire mountain range, especially the Great Fatra, the Western Tatras, Strazovské vrchy and Mala Fatra. The maximum flow of the upper stream is in May, mid and low in April, minimum in the upper and middle streams in January, the low in October.
[source: Encyclopedia of Slovakia, 1982].

4.4.1. Historical contexts

In 1930, the Bratislava Regional Office elaborated the Project of Complex Use of the Váh. The aim of the project was:
• to solve the drainage rates of the valley by systematically adjusting the Váh,
• use the Weapon Water Force to intensify economic activities and to electrify Slovakia,
• gradually floating the Váh to Žilina,

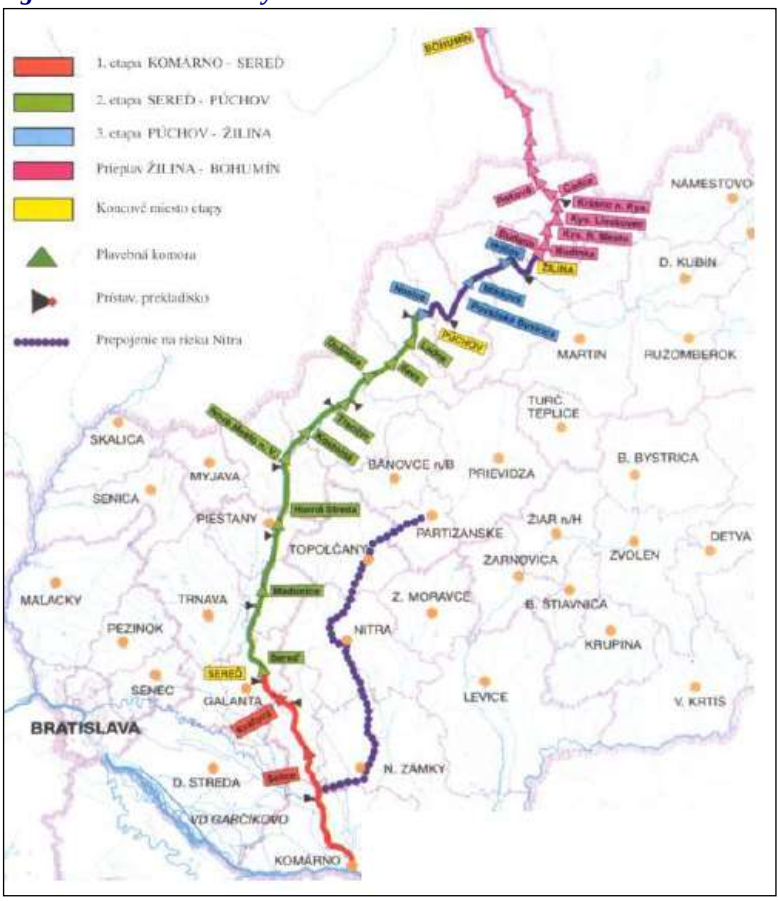
• Improve the supply of municipalities and the emerging industry with water and drainage of agricultural production areas.
The General Impact Adjustment Project was intended for water reservoirs to contain large water (10 to 25 years), to deal with the issue of float flows and the impact of floods on the Váh on the Danube runoff. Systematic adjustment of Vah proposed the regulation of its bed, the construction of protective dams, channels and degrees. The project proposed the construction of 15 energy-grading stages in the Šaľa-Žilina section, the Vah for vessels with a displacement of up to 1200 t with dimensions of 80 x 10.5 x 2 m from Komárno to Žilina in the length of 250 km, with a gradient of 215 m.

Project realisation
In 1936 it was put into operation in Dolné Kočkovce and Ladce. The electrification of Slovakia continued with the construction of other stages of the first mass cascade: Ilava (in 1940-1946), Dubnica (1943-1949), Trenčín (1952-1956).
After the Second World War, construction continued on the 2nd mass cascade. Between 1943 and 1955, Trenčianske Biskupice and Kostolná (in 1943 - 1953), Nové Mesto nad Váhom (in 1943 - 1954) and Horná Streda (in 1946 - 1954) were built.
In the 1950s, the construction of a mining cascade with a hat in Krpeľany and two stages was completed: Sučany (in 1953 - 1958) and Lipovec (in 1956-1960).
In the years 1958 - 1963 a medium-sized derivation cascade Hričov - Mikšová - Považská Bystrica was built.
Sixty years ago, waterworks stagnated, only smaller floodplains were built.
The revival of construction occurred in the 1970s with the aim of more complex use of water resources for electricity generation, water accumulation and distribution for industry, agriculture and recreational purposes. In 1975, the water reservoir Liptovská Mara, which belongs to the buffer reservoir Bešeňová, began to be pumped up among the most important water works, as they affect the operation regime of the whole weighing waterway. With its volume of 360 mil. m3 is the most voluminous water reservoir in Slovakia. The dam is capable of capturing hundreds of flood waves, the installed capacity of four turbines is 198 MW.
In 1982, the waterwork Čierny Váh was put into operation in the Low Tatras National Park. The waterwork consist of an upper tank located at an altitude of 1160 m, a lower tank, a feeder and a 665 MW peak water power plant installed in the peak mode.
In 1985, the Králova waterwork with a volume of 52 mil. m3. The water body consists of a hat, a 45 MW hydro power plant, and a 110 x 24 x 4.5 m (VIa) craft. water body serves as flood protection, gravel extraction and electricity generation.
Water body Selice is equipped with a navigation chamber (dimensions as water body Kráľová) and a hat (two claw hat fields). It serves as a buffer tank for water body Kralova. It allows only a limited voyage on average 220 shipping days per year.
The last water body built on Váh is water body Žilina built above the city of Žilina. Water body set up to protect the area from floods, rehabilitate the Dubeň hill, generate electricity as well as enrich the environment and create conditions for recreational activity. The sheltered building is situated below the mouth of Varbin River. The length of the reservoir is 7.1 km, its width is 250 to 600 m. The water power plant is equipped with two Kaplan turbines with a gravity of 150 m3.s-1 and a drop of 24.1 m, the installed capacity is 62 MW. [Banas, J. et al., 1996]

Project Vah waterway

In 1995, the Standing Committee on Inland Navigation in Geneva has included the VVC on the international waterways list and assigned it the international E 81 code. A year later, it became part of the AGN (European Agreement on Major International Waterways). This agreement was signed by the Slovak Republic at the 3rd Pan-European Transport Ministerial Conference in Helsinki in 1997.

Figure 8 – Vah waterway situation



The implementation of the VVC project will have a beneficial impact on many areas of economic and public life. The route of the waterway coincides with the direction of the European multimodal transport corridors no. Va VI. This VC passes through the Conscience, Slovakia's industrial area, which accounts for about half of the gross domestic product. In the middle and upper part, the Váh Valley is quite narrow with intensive development.

The existing road and railroad traversing the North - South direction and the construction of motorways have now largely exhausted their territorial capabilities. By contrast, the VC has no territorial requirements in addition to the locations of some ports. An alternative to addressing this unfavorable situation is to shift part of the transport flows to waterway, which can have very beneficial impacts on improving the environment not only in Považ, but also in the wider regional area. Marketing surveys conducted in the nineties of the 20th century and at the beginning of the new millennium confirmed that waterway could transport the freight from the export and import of companies and companies from Poland, the Czech Republic and Slovakia, transit from Poland to Austria, Hungary and the Balkans freight traffic in the direction of Poland - Turkey. Waterway could be transported annually at CZK 3 560 million. tons of coal, cement, steel structures, building and metallurgical materials,

chemical products, and the like. The timetable for the implementation of the Vah waterway stages is dependent on the funds and the development of the national economy.

4.4.2. Current state and perspective

Vah waterway is a 250 km long waterway section from Komárno to Žilina. This is a waterway, which is mostly built. At present it is necessary to finish waterwork Kolarovo, a few kilometers long stretch of Váh around Sered and complete, respectively. Reconstruction of sailing chambers at some seagoing stages.

Vah waterway can be divided into four segments (according to its floating stages):
1st section Komárno - Sereď: the waterway was opened in this section of Váh in June 1998 after the completion of waterwork Selice. There are two water works on this section: waterwork Selice (rkm 43,9) and waterwork Králova (rkm 63,2). They are equipped with two 110 x 24 m cargo flasks, corresponding to the AGN class VIa. For the time being, cruising takes place only in limited voyage mode, which represents a dive of only 2.0 m (AGN should be at least 2.5 m). This unstable water body, especially in part of the Váh to the Danube, is due to the incomplete lowering of the Gabčíkovo-Nagymaros waterwork system. Its completion would provide the necessary air of the Váh from Komárno to Kolář. In the event that the lower stage is not set up, it will be necessary to add one waterwork at the level of Kolar, which will ensure the required sailing depth.

Figure 9 – Waterwork Kráľová and its lock

Source Dávid, Andrej

2nd section Sereď - Púchov: from the point of view of completing the VVC this section is the most demanding. It is currently completing the construction of waterwork Sereď. From Hlohovec to Púchov, the cruise will be realized in the canal cascade channels and in the reservoirs of water works SÍňava, Trenčianske Biskupice and Dolné Kočkovce. The navigation chambers in Madunice, Horná Streda, Nové Mesto nad Váhom, Kostolná and Trenčín are partly built, in Dubnica, Ladce and Ilava are only chambers with the dimensions of the walnut, therefore it will be necessary to reconstruct them, respectively. to build new chambers to suit Class V cruise for a minimum dive of 2.5 m.
3rd section Púchov - Žilina: the cruise is solved (similarly to the 2nd stage) in the canal cascade canals and in the reservoirs of water works Nosice and Hričov. At the Nosice, Považská Bystrica, Mikšová and Hričov levels, it will be necessary to build a lock, because

they do not have these grades. According to the classification of waterways, this stretch will be in Class Va with a minimum voyage depth of 2.5 m.
Between Zilina and Komárno are planned to build twelve inland ports of various sizes, technical equipment and work technology. The port of Žilina should be the largest port on Vah waterwork.
4th section Zilina - Bohumín : this is the interconnection of the Vah waterwork with the river Odro through the Kysuca river basin, the overcoming of the top rebate at the state border between Slovakia and the Czech Republic, the Olše river in the Czech Republic until its mouth in Odra at the state border between Czech and Poland . It is a perspective route that would connect the VVC with the Odrou, connecting the Danube, Váh and Odra waterways in the North-South Central Transport Corridor.

The basic data on the navigation stages, including the classification requirements for the Komárno - Žilina section, are presented in the tables.

Table 3 – Floating steps on the Komárno - Žilina section

Water structure	Height elevation equipment	stand	River km	Class	dimensions PK a LZ		
					Elevation [m]	lenght[m]	width[m]
Kolárovo	Lock	proposal	27,5	VIa	2,7	110	24
Selice	Lock	existing	44		1,5		
Kráľová	Lock	existing	63		13,0		
Sereď	Lock	proposal	83		17,1		
Madunice	Lock	existing[1)]	107	Va	17,4	110	12
Horná Streda	Lock		127				
Nové Mesto nad Váhom	Lock		140		16,0		
Kostolná	Lock		153		15,7		
Trenčín	Lock		162		12,3		
Dubnica	Lock	existing[2)]	173		13,0		
Ilava	Lock		180		12,7		
Ladce	Lock		187		13,1		
Nosice	Boat lift	proposal[3)]	200		21,3		
Pov. Bystrica	Lock	proposal	213		13,5		
Mikšová	Lock	proposal	221		23,6		
Hričov	Lock	proposal	238		8,6		

Source: Pálfy, R. 2001

Notes:
1) Lock was designed with dimensions 12x85m, it was built only partly
2) Lock has original dimensions 7x34m, reconstruction in process at present time

3) Suggested parameters-depth.4m, length 100m,speed15m.min^{-1}

Table 4 – Required classes of Vah waterway according to AGN agreement

Section	Navigation class	Tonage [t]	length of the ship's kit [m]	width of the ship's kit [m]	dive [m]	underpass height under the bridges [m]
Komárno - Sereď	VIa	3 200 – 6 000	95 –110	22,8	2,5 – 4,5	7,0 – 9,1
Sereď - Žilina	Va	1 600 – 3000	95 –110	11,4	2,5 – 4,5	5,25 – 7,0 – 9,1

5. CHARAKTERISTICS OF WATER TRANSPORT

5.1. Transport costs

The design vessel for the considered Va waterway class is a motorized cargo ship with dimensions of 95-110 m in length, 11.4 m in width, 2.5-2.8 m and load capacity 1500 - 3000 t or a 95-110 m pushdown assembly, with a width of 11.40 m by submersion 2.50 - 4.50 with load capacity 1600 - 3000 t. Model can be considered with this vessel:
Motorized cargo ship MN 11600 with a length of 80 m, a width of 9.30 m and a maximum load capacity of 1 265 t.
For the purpose of studying the feasibility of the Danube-Odra-Elbe water corridor, a total of 15 transport connections across continental Europe, valued (without the existence of D-O-L) as a basis for the determination of freight costs in potential multimodal transport chains, were examined.
Total shipping costs include port charges at the point of loading (so-called "ošupné"), overpass transport including translation, import of the given mode of transport and sessions and the so-called last mile.
The averaged 15 survey results are as follows:

Table 5 - 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 6 – 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 7 – 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 8 – 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

It is clear that, in all cases, carriage where inland navigation is the main carrier is the lowest cost, even if all additional payments are included.
Of course, the use of good waterways is a prerequisite, which will be met in the case of the Odra waterway (as well as the Wah Waterway) after modernization and construction.

5.2. Speed

For the division of freight transport between road, rail and water transport, it plays an important role, in addition to transport and freight rates. Higher speed is especially important for expensive or quickly perishable goods. For commodities, however, the reliability of supply is also important, where water transport on high-quality waterways is a priority. There are no congestion on waterways that cause unpredictable delays.
The D-O-L feasibility study, which has reached the following values on the basis of surveys:

Table 9 – Freight transport average speed

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

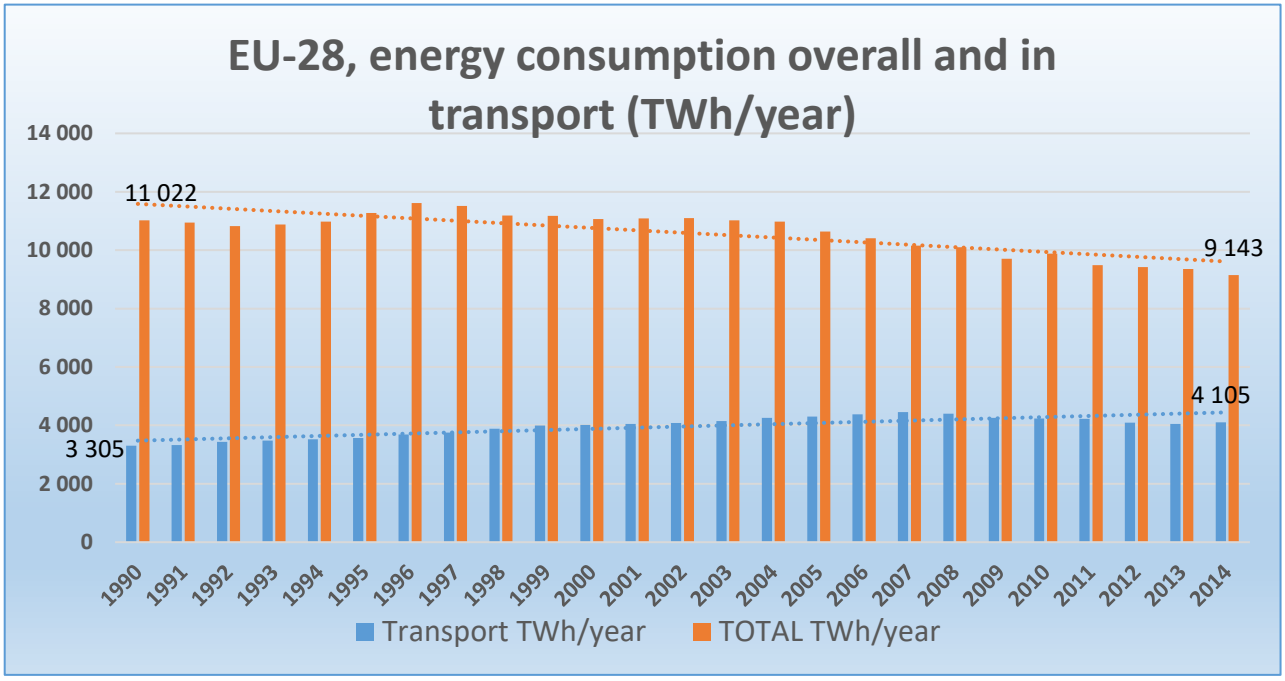
The following must be added to the table:
• water transport is not a technical speed (this is usually about 15 km/h for economic reasons), but the speed at which the delays are counted in the lock chambers; From this point of view, the speed is final;
• for large boats, it is economically worthwhile to rotate during the cruise of 2 crews, so on a number of waterways it sails 24 hours a day;
• in the case of rail and especially road transport, the resulting speed is uncertain with regard to traffic congestion;
• for road transport, it is necessary to take into account, in addition to congestion, mandatory breaks and various national restrictions (eg weekend rides, etc.).

5.3. Energy consumption

Energy consumption is currently a highly watched economic and environmental category of categories, both in and outside the transport sector.
Attention is drawn to the fact that while overall energy intensity in the EU is gradually decreasing (in 25 years to about 83% of the 1990 state), transport consumption is increasing, both relative and absolute - namely to 124.2% compared to the state of the year 1990. Therefore, shipping and rail transport, such as those with lower energy consumption, are receiving considerable support from a number of European governments and EU representatives.

The time series in the countries of the European Union shows the following dates:

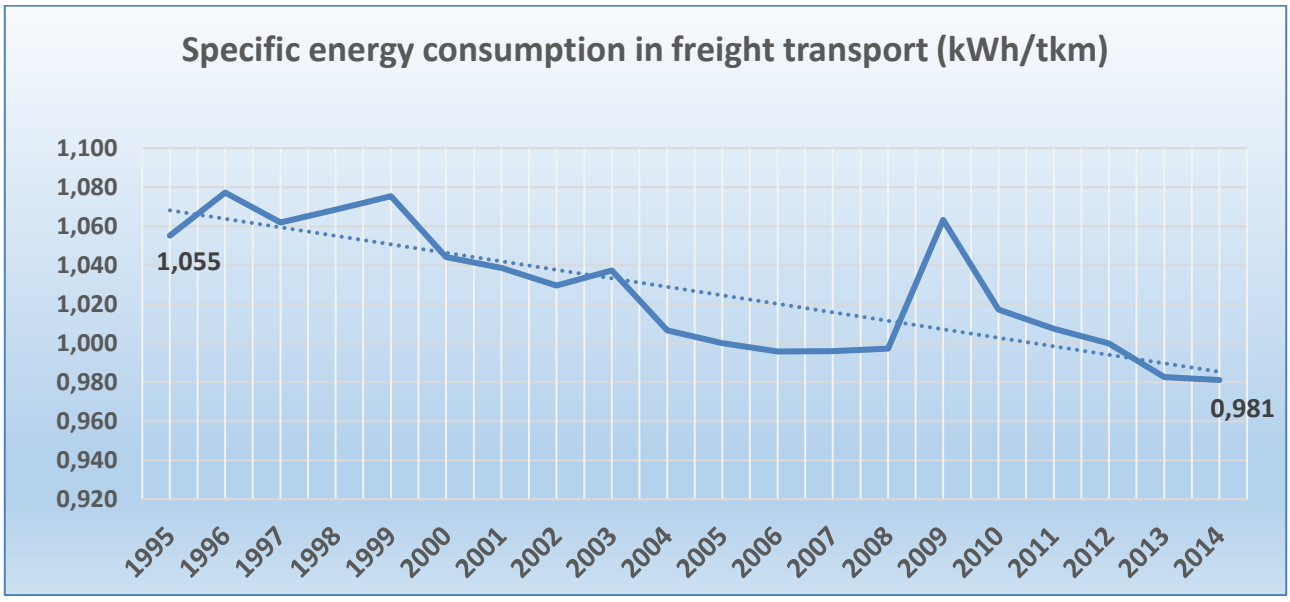
Table 10 – Energy consumption



Source: Statistical Pocketbook, own procesing

Nevertheless, a number of measures are progressing in transport, which gradually reduce specific energy consumption - the overall increase is mainly due to the overall increase in transport.

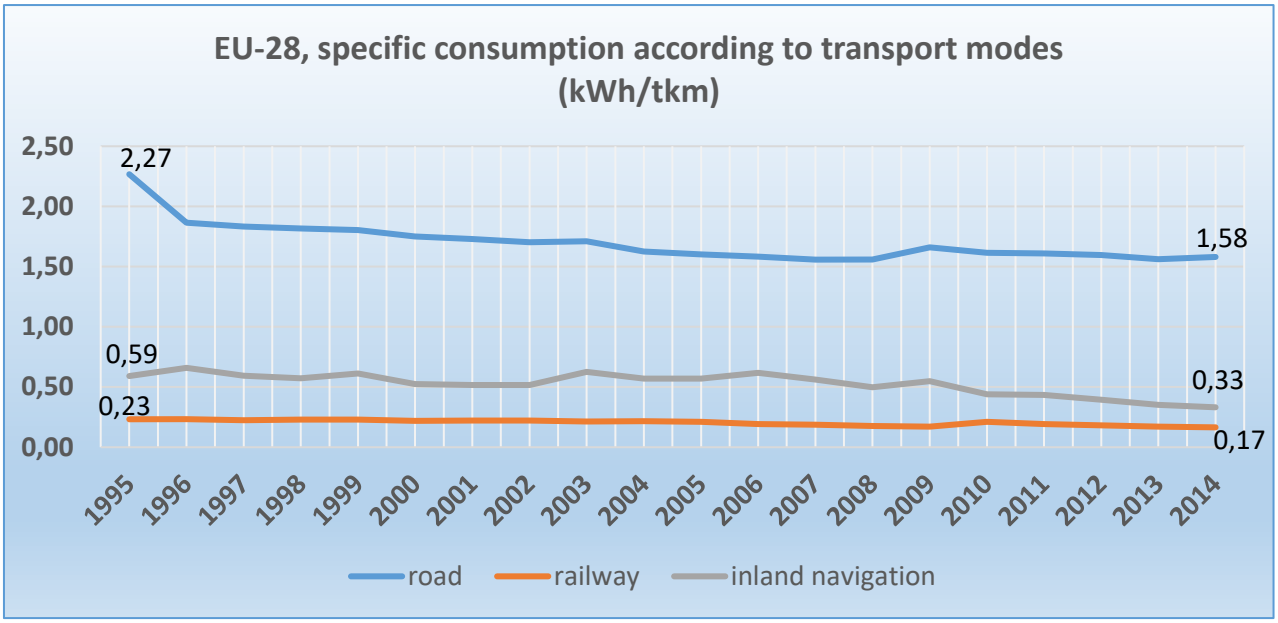
Table 11 - Specific energy consumption in transport



Source: Statistical Pocketbook, own procesing

Consumption by modes of transport can also be best demonstrated in the long-term ranges of European statistics:

Table 12 - Specific energy consumption according to transport modes



Source: Statistical Pocketbook, own procesing

It is also clear from these dates why the EU intends to favor rail and waterways in the long term, as repeatedly mentioned in EU documents.

In addition, continuous research and innovation are taking place in all transport sectors - ships already operate, for example, not only on natural gas (LNG) but also on electric and hydrogen propulsion. These trends will undoubtedly increase.

5.4. Environment impact

Small environmental impacts (so called externalities) are among the important and recognized advantages of water transport.

There are a number of studies and methodologies in Europe to determine the external effects of transport, some more complete (more criteria), others less complex; in addition, they often produce very different results. This allows different groups of experts and public officials selectively to select more useful backgrounds for them.

Reasonably chosen by the processors of the study "Socio-Economic Impact of the Development of the Lower Vistula" (Gdansk, 2017), who decided to process diameters of more relevant European studies.

A similar procedure was also chosen for the feasibility study of the Danube-Oder-Elbe waterway corridor, but the originally used sources were expanded by the "climate impact" parameter, according to Inland Navigation Flanders research.

Table 13–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)*

Due to the expected innovations in the transport sector, this data can be expected in the future:

Table 24 - 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 transport is its high safety. This is also apparent from the external transport cost tables, where in all cases inland navigation data is much more favorable than that of the railways and even the whole road traffic regulations.
Statistical data on killed and injured people in traffic accidents is provided, for example, by the Texas Transportation Institute:

Table 3 - 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

5.6. Waterway operation

5.6.1. Basic rules

Under the Agreement on Major Waterways of International Importance (AGN), traffic rules are clearly defined as follows:
a) Operation of 345 days a year:
This condition is practically unimaginable in the main waterways, with the "remaining days" counting not only unfavorable climatic conditions, but also maintenance and repair of navigation equipment. Maintenance of intermediate sections is usually performed during operation.
b) Possibility to operate a 24-hour cruise:
Modern waterways usually allow 24 hours a day. For radar reflectors, radar reflectors are installed, the "ship-to-ship" and "ship-to-ship" rules for the operational planning of navigation by navigation facilities are unified. The exception is not the self-service control of navigation equipment eg in night hours, generally at a time of weaker operation, where the presence of the operator would be ineffective.

5.6.2. Operational practice

Low flow rates and his impact to operation:

River sections are of course more sensitive to flow than canal sections. Here, however, it is necessary to distinguish between free-flowing and floating-point flows. In the sections with cruising speeds, practically the same as for the canals, they are fully operable even at low flow rates. According to AGN, the free flow must be adjusted to provide at least T = 1.6 m for 345 days a year.

Channel sections are already independent of current flows.

Increased flow rates and his impact to operation:

River sections: The crucial fact is that significantly increased flows occur, as a rule, only a few days a year. The vast majority of waterways are designed to allow undisturbed and safe

sailing up to Q1, that is to say the level of high water, which is repeated on average once a year.
For **the canal sections** again, no increase in flow rates have any effect. An exception may be those sections that are consciously designed and used to divert large waters (for example, some sections of the Mittellandkanal in Germany).

Winter traffic:

The question of winter traffic is mainly related to two phenomena-frosting the waterway and ice freezing on the structures.
Frozen waterways: Solid frosts are not a long-term phenomenon in our climatic conditions. Frosting is either water-based (by flowing the water so that the water can not be continuously frozen) or technically (using icebreakers). Possible breaks due to heavy frosts are more of a calamity, but they are also reflected in other modes of transport, and even in other economic areas.
Freezing of structures: This problem is usually solved either by the use of suitable (non-flammable) materials or by the heating of sites of hydrotechnical structures (usually movable parts of weirs and sailing chambers).

Repairs and maintenance:

Repairs and maintenance, if their nature requires a restriction or even a disruption of operation, are carried out on a planned basis, and the shipping public must be informed in good time. As mentioned above, more complex repairs must be carried out in such a way that the total interruption of operation in one year does not exceed 20 days-including any disruption of operation due to adverse natural conditions.

The question of all-day traffic:

Ensuring 24/24 mode sailing is not a problem today. Technically, it is usually provided on important waterways-radar reflectors are deployed and the radio link is functional. The question of using or not using this option is, however, rather economic. Continuous cruise 24 hours a day means multiple crew and hence higher operator costs. From this point of view, therefore, it depends very much on the type of goods transported, ie whether it is more likely to "allow" a longer transport time or a higher transport price.

Accidents:

Crash on waterways is a very rare phenomenon, as it is even documented, to be devoted to the safety of the voyage. Any limitations on the traffic that are going on are even more rare, to the extent that one single crash will become an event worthy of media attention in a number of states. However, a number of waterways will not occur for several years.

6. POSSIBILITIES OF GOODS TRANSPORT TRANSFER TO WATERWAYS IN TRITIA REGION

6.1. Oder waterway, transfer potential, traffic flow intensity

The question of the transfer of freight transport to environmentally preferable modes of transport was devoted to the European Union institutions by a series of documents referred to above. Similarly, the national documents of the participating states are similar. From this perspective, it is essential to define the potential that Odra waterway will have after its modernization. An important factor in this potential is, in particular, the fact that its southern end serves a major European economic area, while the northern end is situated in the seaports of Szczecin and Swijnoujscie. This results in large volumes of goods and products that move or gravitate in the Odra corridor. In addition, the region is also an important transit territory.

A very comprehensive answer is provided by the finalized study of the feasibility of the Danube-Odra-Labe waterway corridor. According to the transport model (SUDOP Prague), the transports on the Odra waterway should amount to approximately 31 million tons per year (2045) respectively. 34 million tonnes / year (2050) respectively. up to 42 million tons per year (2079), excluding domestic transport in Polland.

The vast majority of these shipments will be for a longer distance than 300 km. The statistics (Eurostat-EU 28) show an average voyage distance of 495 km (2011) for the inland navigation, the SUDOP transport model 2015 (511 km).

Basic transport directions in 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 freight from road to other modes of transport, in line with the European Union's intention, will be addressed above all in the case of traffic flows crossing the border of the TRITIA region, given that the European Union's White Paper on freight transport over 300 km.

6.2. Very large and very heavy products

The transport of very large and very heavy products (and in particular of industrial plants) is one of the important objectives, because in the wider region, the similar production is widespread. Since rail transport is very limited in this respect (and is not in principle applicable), and water transport is not yet available, road transport is used, which is associated with high costs and a number of complex measures.
From an analysis elaborated by a group of the most important carriers of heavy and oversize load for the years 2013 to 2016, it is clear that the existing transport of oversize load from the sources for which the use of the Odra waterway seems to be profitable was realized as follows:

Table 16 - Total number of sets depending on the relation and total weight of the set

Relation	60-100 t	100-150 t	150-250 t	250-350 t	In total	Share in all transport
Ostravsko – Mělník	168	183	67	20	438	7%
Ostravsko – Lovosice	142	91	28	13	274	4%
Ostravsko – Bratislava	18	23	11	10	62	1%
Brno – Mělník / Lovosice	82	39	6		127	2%
Brno – Bratislava	11	23	8		42	1%
Hradec Králové – Mělník / Lovosice	96	111	13	2	222	4%
Přerov - Mělník	180	63	7		250	4%
Ostatní relace v Česku	2861	1675	196	32	4764	77%

Figure 10 – Total number of oversize sets

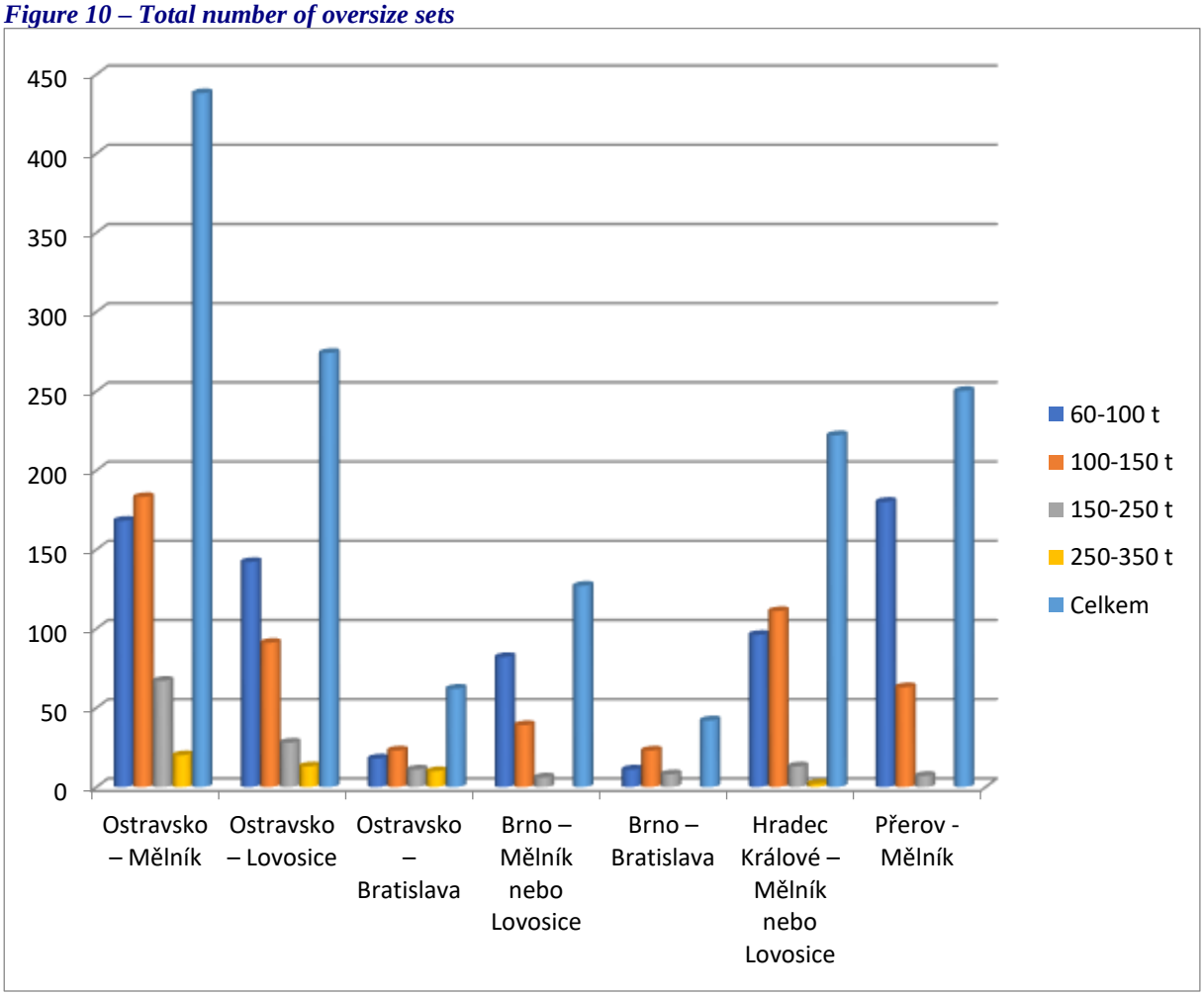
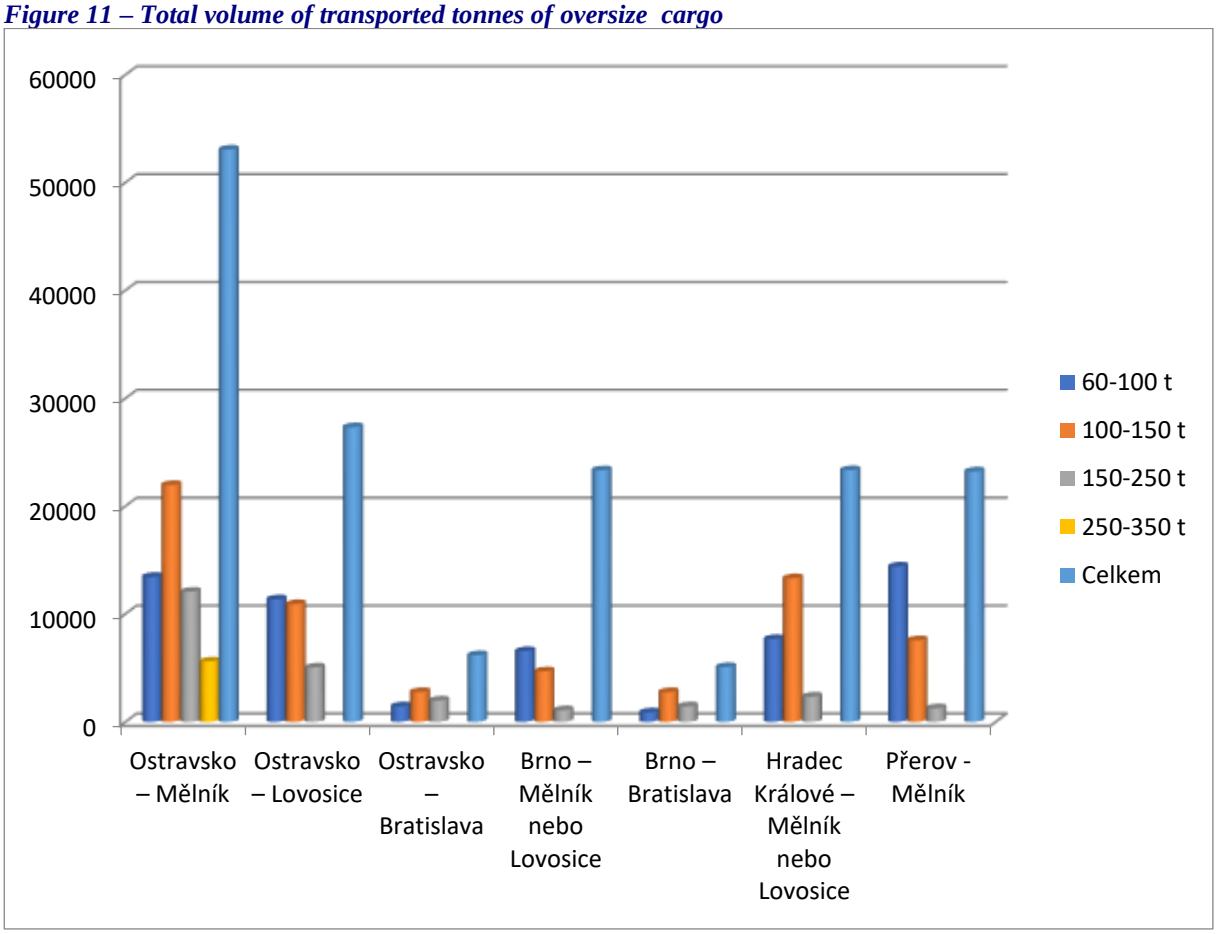


Table 17 - The total volume of transported tonnes of cargo, depending on the relation and total weight of the kit

Relace	60-100 t	100-150 t	150-250 t	250-350 t	In total	Share in all transport
Ostravsko – Mělník	13440	21960	12060	5600	53060	9%
Ostravsko – Lovosice	11360	10920	5040		27320	4%
Ostravsko – Bratislava	1440	2760	1980		6180	1%
Brno – Mělník / Lovosice	6560	4680	1080		23320	2%
Brno – Bratislava	880	2760	1440		5080	1%
Hradec Králové – Mělník / Lovosice	7680	13320	2340		23340	4%
Přerov - Mělník	14400	7560	1260		23220	4%
Other directions in Czech	228880	201000	35280	8120	462280	75%

Figure 11 – Total volume of transported tonnes of oversize cargo



23 % of heavy and oversize load and 25 % of the total volume transported were directed to destinations that could be at least partly replaced by the Odra waterway combined with the road section to a suitable port on the Odra.
This is not a negligible proportion of all oversize transport carried out in the Czech Republic. The existence of a reliable Odra waterway along with a sophisticated road infrastructure to connect ports to other resources and targets can be an advantage in the difficult competitive

environment not only of carriers, but above all producers and manufacturers of goods whose parameters fall into the oversize transport sector.
If 23% of shipments can be assessed as transferable, one oversized parcel could be transported on a water transport basis each working day in the reference period.

6.3. Transfer of bulk material transport on shorter sections than 300 km

Inland waterways transport and short-haul transport can be advantageous because river vessels can carry more goods per tonne (tkm) than any other type of land transport and could thus contribute to the limitation of road traffic and the liberalization of rail transport capacity. Vessels for inland navigation have a carrying capacity corresponding to dozens of lorries, which could help save transport costs, reduce emissions and relieve traffic on the roads. Inland waterway traffic is also very safe, dry (loose) costs are a commodity whose shipping is traditionally entrusted to shipping.

Above all, they are gravel, stone, basic chemicals, fertilizers, agricultural products, ores and coal. Commodities with a low kilogram price, low handling requirements and regularity of supply require low-cost shipping routes that ship shipping to a quality waterway is able to provide. Contemporary shipping, thanks to educated crew and modern ship equipment, allows transport with precise timetables. Shipping is as reliable as rail transport and, unlike road transport, is less dependent on the current traffic situation and weather.

For the TRITIA region, the transport of building materials, especially aggregates, as well as coal transport, is very promising. Transport of impacts, especially mixed municipal waste (SKO), can be interesting too. Other commodities can not be excluded, but they are likely to be limited volumes.

6.3.1. Building materials

For construction, in general, the transport of aggregates by trucks to buildings over a distance of more than 100 km from the quarry is economically unprofitable. The aggregate price varies between 200-300 CZK / t, while the freight wagon typically has a load capacity of 28-30 tons. Current rates for transportation are at CZK 35 / km. Transport of aggregate taken at the price of 250 CZK / t for a distance of 100 km represents 47% of the value at which the aggregate was purchased. The involvement of shipping would allow the delivery of aggregate for considerably longer distances, even to areas where there is a lack of quarries with high quality aggregates.

A typical option for the area could be the transport of gravel from the Raciborz area, where intensive mining activities take place, to the Moravian-Silesian Region - and especially to Ostrava - where the material is rather deficient.

In recent years, the production volumes in the Czech Republic are very stable - about 11-13 million m3 / year. The largest production of gravel is in the Central Bohemia, Ústí, Jihomoravský, Olomouc and South Bohemia regions, while in the Moravian-Silesian Region they are lower - partial importance is given by the gravel of the middle stream of Opava up to its confluence with Odra. The potential for the construction of gravel pitches for local construction could thus reach up to 0.5 million m3 / year, ie about 1.5 million t/year. Forman

6.3.2. Coal

In view of the decline in black coal mining in the Moravian-Silesian region, the bulk imports of black coal from Poland will be expected in the coming years. According to the calculations of the SEK (State Energy Concept), the highest rates of imports of hard coal would be achieved between 2020 and 2030, but imports will probably be significant in later years.
In 2017, imports of black coal from Poland reached 3 million tonnes.

6.3.3. Waste

From 2024, legislative measures will be fully enacted, making it practically impossible to deposit mixed municipal waste (SBOs). In addition to sorting and recycling, it is heavily involved in the processing 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 the concentration and subsequent collection of SKO into these localities.

According to the Czech Statistical Office, 3.6 million tonnes of municipal waste were produced in the Czech Republic in 2017, an increase of 7.3% compared to the previous year. On average, 339 kg of municipal waste was per inhabitant.

According to available data, it can be deduced that out of these 339kg, on average only 90kg was recycled, 55kg was used in incineration plants and 194kg of it was landfilled. This means that in the future, the amount of municipal waste shipped will significantly increase in the household → roadway → incinerator. In particular, transshipment (ie waste concentration points) into incineration plants would be a relatively high load on the roads.

A number of European metropolises and agglomerations address shipping by shipping. Newly, a similar solution within the Czech Republic is aimed at the Central Bohemian Region with 1,139,000 inhabitants. The technology should consist of the SKO collection at the transshipment site, where waste is compacted 6: 1 in containers and then shipped to the incinerator.

TRITIA has 7,885,000 inhabitants, representing approximately 1,775,000 tons of incinerated waste per year. Many of the settlements are located in potentially navigable streams (Odra, partially Váh). The transfer of about 50% of this volume to water transport (ie about 0.9 million tons / year) is therefore realistic.

6.4. Transfer of container transport between terminals

As part of the chapter's work, an example from another location in Europe was sought, which could be identified as a reference for the future use of container transport on shorter routes between terminals within the TRITIA region.
For the distance of up to 200 km, only the connection between Antwerp and Duisburg was found, but its characteristics are unique, both in the size of the Duisburg port and the size of the port of Anwerpa.
In this respect, the significant use of containerized inland waterway transport within the TRITIA region can not be predicted.

6.5. Transfer of traffic due to bottleneck in other modes of transport

„ If all free capacities were used in Europe today, road transport will be reduced by only three percent, "said Mr. Starosta (ČESMAD BOHEMIA), referring to the study available to him. – 11.10.2018, www.zdopravy.cz

Bottlenecks, ie places with insufficient traffic flow capacity, are a factor that affects the economic efficiency of the entire transport route, although it can only be a matter of point. The evaluation of potential narrow throats is done in Chapter 2c.
Narrow throats for transport are:
- Insufficient capacity roads and congestion
In the event that the road transport delay is of such a magnitude that it significantly degrades the average speed of the whole route. These places would have to be more on the route, in the main transport routes, where the intention to operate the shipping is in the future but capacitive road communications are currently being built.
- Insufficient capacity rail
The factor becomes crucial, because the "rail network optimization" has reduced the capacity of the railway stations due to the number of tracks and their useful lengths. At the time of day, there are several hour periods when freight trains can not be traveled between passenger trains and the average speed is thus degraded below the speed of shipping.
- Insufficient parking capacity for mandatory rest breaks
An inadequate number of parking spaces must be taken in the same way as an insufficient number of tracks in railway stations. If it is not possible to carry out a regular break, it is not possible to drive at all or to look for a parking space outside the main traffic, which means time and economic loss.
- Exclusions in transport
Complete stopping of traffic occurs either regularly during holidays or work-off or accidentally, usually in the event of traffic accidents or adverse weather. Their consideration for the choice of mode of transport is problematic because they occur unplanned. It can be limited, for example, in the winter, when complications can take on road transport even in days.
- Stretching profile for traffic flow through maintenance
At present, it is possible to trace on ongoing or undergoing constructions that roughly once every twenty years it is necessary to reconstruct with the use of longer transport constraints both highway and railway infrastructure. On longer routes, from spring to autumn months, it is not possible to realistically calculate that there would be no time constraint and that some of the routes would go without one of the sections being under reconstruction.

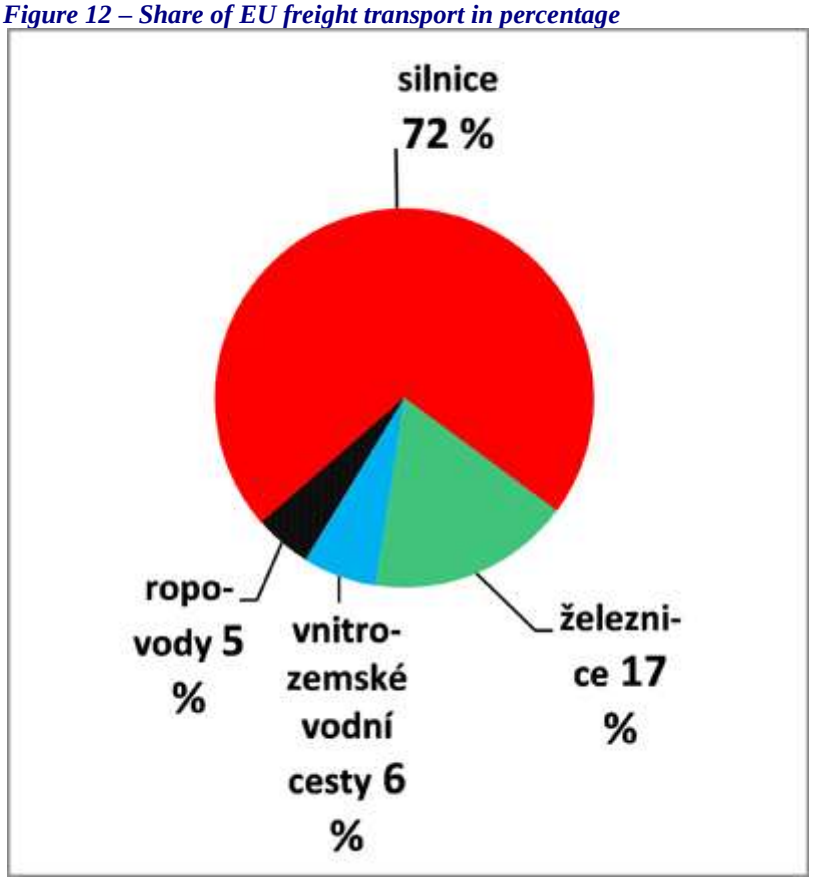
7. TECHNICAL CONDITIONS OF GOODS TRANSPORT TRANSFER

7.1. Sufficient traffic flow

(Notes: Chapter will be updated after finish of D.T3 - Transport model if necessary)

Road haulage is the most important type of land transport in the EU and accounts for over 70% of all ground transport activity as shown in Figure 1. The share of road transport in total freight land transport has remained relatively stable over the past ten years.

Figure 12 – Share of EU freight transport in percentage



Source: 7.10.2014 https://www.dlprofi.cz/33/situace-na-trhu-silnicni-dopravy-v-eu-uniqueidgOkE4NvrWuMEMvw3uZDmFpZE3CCfG4q8yS-8ZYRKejY/
Notes: For 2013, the specific report of the European Court of Auditors shows 75% of the road transport share. and rail transport 17.8%.

More than half of all cargo (in terms of weight) in road transport is transported to distances of less than 50 km and more than three quarters of cargo at distances less than 150 km, according to calculations based on Eurostat data
Based on the above, this will be about 10% of the road traffic that should be transferred. Transferable transport over longer distances is assumed to move along the axis of the main transport corridors. The subject of further assessment is not the traffic flows outside these main corridors.
Depending on the distribution of the total quantity transported to the various types 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%. Due to the fact that the share of water transport and navigable waterways in the TRITIA region is minimal, rail transport would have to be increased, which would mean an increase of 60%, which can not be achieved on all routes. The result can then be shifting to another mode of transport, namely water transport after congestion and flooding of existing waterways.

7.1.1. Czech republic

Road transport - Year 2018
According to the census in 2016, the number of freight vehicles (excluding vehicles up to 3.5 t) in the waterway direction was as follows:
Ostrava direction south - 4425 daily with an estimated tonnage of 111 thousand tons
Ostrava direction north - 2981 vehicles daily with an estimated tonnage of cargo of 74 thousand tons
According to the White Paper, if 30% of the transport is achieved, it would be necessary to convert 37,000 tonnes of goods in the south direction and 25,000 tonnes in the direction north to the year 2018. The current traffic flow on this route can now be considered as large enough in order to transfer the cargo to other modes of transport. The transmission values in tonnes correspond to approximately 35 pairs of freight trains in the south and 25 pairs of freight trains north or 18 pairs of fully loaded kits south and 13 pairs of fully loaded kits northward in class Va.

Railway transport - Year 2018
The total number of freight trains on the main corridor lines varies depending on individual inter-stationary sections. MSK does not only serve as transit territory in freight rail transport but contains a number of starting and target traffic flow centers that substantially alter the number of trains trains across the region. At present, about 127 freight trains are operated by Ostrava. With this amount of trains, up to 254,000 tons of materials and goods can be transported.
Looking ahead, it is planned to increase freight traffic. By 2030, 30% of the rail transport and rail transport will be transferred. The estimated number of freight trains running through the Ostrava node is 194 trains. At present, the railway infrastructure would not be able to accommodate the expected range of transport. Forward rail transport is considered by the capacity utilization of narrow railway infrastructure sites (see the Ostrava Node study) in MSc.
Due to the planned capacity of the railway infrastructure, it is not possible to transfer a significant amount of road freight.

Railway transport - Year 2030
In 2030, it is necessary to consider the increase of transport by the coefficients with the need to import coal, which is no longer likely to benefit in the region.
Looking ahead, it is planned to increase freight traffic. By 2030, 30% of the rail transport and rail transport will be transferred. The estimated number of freight trains via the Ostrava node would be 194 trains with 388,000 tons of goods. At present, the railway infrastructure would not be able to accommodate the expected range of transport. Forward rail transport is considered by the capacity utilization of narrow railway infrastructure sites (see the Ostrava Node study) in MSc.
Due to the planned capacity of the railway infrastructure, a significant amount of road freight transport can not be guaranteed.

7.1.2. Poland

Road transport - Year 2018
The GDDKiA report on the traffic intensity on the national road network shows that the average annual motor traffic (SDRR) in 2015 on the national road network was 11,178

vehicles / day. In the Śląskie Voivodeship there was definitely the highest traffic load, amounting to 20017 vehicles / day on national roads, 38848 vehicles / day on international roads and 13,409 vehicles / day on other roads. In the Opolskie Voivodeship (9th place in the intensity ranking), this intensity amounted to 9,269 vehicles / day on national roads, 30155 vehicles / day on international roads and 6506 vehicles / day on other roads. Intensity on selected road sections is shown in the table below. The complete list of national and international roads of the Śląskie and Opolskie voivodships on individual sections and by type of vehicles is presented in the appendix "Traffic measurement".

Table 18 - Average daily annual traffic (SDRR) on selected sections of roads in the province Silesia and Opole

Road No.		SDRR total	Light trucks (vans)	Trucks	
National	Section			Semi-trailer	Trailer
		Number/day	Number/day	Number/day	Number/day
1	2	3	4	5	6
S1dA1b	WEZEŁ PYRZOWICE-WEZEŁ PIEKARY ŚLĄSKIE	14770	1115	369	3089
A1b	WEZEŁ GLIWICE WSCHOD-WEZEŁ SOŚNICA	40460	3097	1243	5712
A1a	WEZEŁ SOŚNICA-WEZEŁ KNUROW	43534	3598	1122	6010
A1a	WEZEŁ MSZANA-WEZEŁ GORZYCE	10933	1076	227	2908
A1a	WEZEŁ GORZYCE-GRANICA PAŃSTWA	9063	907	176	2782
A4	WEZEŁ OPOLE ZACHOD-WEZEŁ OPOLE POŁUDNIE	28213	2283	900	7921
A4	WEZEŁ OPOLE POŁUDNIE-WEZEŁ KRAPKOWICE	29195	3047	933	7448
A4	CHORZOW-KATOWICE	56797	4802	1174	6718
A4	KATOWICE/PRZEJSCIE/	100983	6722	1759	7749
A4	KATOWICE-WEZEŁ MYSŁOWICE MORGI	57113	3355	1363	6626
1	CZESTOCHOWA-POCZESNA	48493	4237	1373	8776
1	TYCHY-KOBIOR	32713	3081	1038	3738
1	CZECHOWICE DZIEDZICE-BIELSKO-BIAŁA	37766	3300	1076	3881
S1	WEZEŁ BIELSKO-BIAŁA KOMOROWICE-WEZEŁ BIELSKO-BIAŁA ANDERSA	43238	3621	1526	3150
S1	WEZEŁ BIELSKO-BIAŁA ANDERSA - WEZEŁ BIELSKO-BIAŁA WAPIENICA	46341	4054	984	2954
45	OPOLE-ZAWADA	14025	956	453	1183
46	BLACHOWNIA-CZESTOCHOWA	11455	1019	289	1143
46	CZESTOCHOWA-JANOW	4489	396	127	316
S69	WEZEŁ BIELSKO-BIAŁA KOMOROWICE-WEZEŁ BIELSKO-BIAŁA ROSTA	34660	3270	1008	1837
S69d	WEZEŁ LALIKI II-GRANICA PAŃSTWA	1058	175	21	8
78a	GR.PAŃSTWA-ZABEŁKOW	2493	166	82	791
78a 78	ZABEŁKÓW-GORZYCE /skrzyżowanie z ul. Raciborską/	5714	328	99	217
78	GORZYCE (skrzyżowanie z ul. Raciborską)-WODZISŁAW ŚLĄSKI /DW 933/ (ul. Pszowska)	9531	506	148	165

78	WODZISŁAW ŚLĄSKI /DW 933/ (ul. Pszowska)-/DW 933/ (ul. Jastrzebska)	16513	812	321	479
78	TARNOWSKIE GÓRY /DW 908/-ORZECH	15363	971	434	809
78	PYRZOWICE /DW 913/-SIEWIERZ	8807	761	331	1211
81	MIKOŁÓW / PRZEJŚCIE/	32986	2269	459	793
81	MIKOŁÓW /DK 44/-ŁAZISKA GÓRNE	27376	2395	461	946
S86	SOSNOWIEC-KATOWICE	112212	7685	2500	5095
94b	CZELADZ-BEDZIN	15088	1103	409	697
94b	SŁAWKÓW/PRZEJŚCIE/	25294	3302	793	2370

Railway transport - Year 2030

From the report on the operation of the rail market in 2017, the Railway Transparency Agency shows that the downward trend has been broken. The increase in the weight of transported loads in 2017 was related to the general recovery of many branches of the economy and a number of new investments. During this period, 72 entities operated on the market, including one broad-gauge carrier - PKP LHS. The best results in transport - taking into account the weight of transported goods and transport performance (up to 75%) were achieved by PKP Cargo, DB Cargo Polska, CTL Logistics and Lotos Kolej.
Freight carriers transported 239.9 million tons of cargo, which represented an increase of over 7.9% compared to 2016. Transport performance amounted to 54.8 billion tons-km and was higher than in 2016 by 4.2 billion tons km, - 8.3%. The average distance of transport increased from 227.8 km in 2016 to 228.5 km in 2017.
One of the most important for the implementation of connections on the lines belonging to the Baltic Sea - Adriatic Sea corridor is the border crossing in Zebrzydowice / Petrovice u Karviné. According to the carriers to or from the Petrovice / Zebrzydowice station, about 150 trains, known as intermodal units, were arriving / departing each month.

Road and railway transport -2030

Taking into account the assumptions contained in the white paper, transport by 2030 30% of road transport of goods at distances greater than 300 km should be transferred to other modes of transport, such as rail or water transport, and by 2050 this should be over 50% of this type of transport. This will affect the development of efficient ecological transport corridors. The development of an appropriate infrastructure of rail and waterways is in this case a necessary tool for the realization of this goal.

7.1.3. Slovakia

Road transport - Year 2018

In 2015, in the territory of the Slovak Republic, a nationwide road census was organized as part of a European-wide road census, organized by the European Economic Commission and the international organization EUROSTAT. This has been done on all sections of motorways, express roads, roads I and II. class and selected sections of roads III. Classes. The results of the national census for 2015 for selected sections within the Žilina Self-Governing Region (hereinafter ZSK) are summarized in the following table. The high share of heavy freight on I / 11 along with the I / 12 route between Žilina and Čadca to the Czech Republic and Poland is due to transit in the north-south direction and to the transport between the Zilina and Bohemian Nošovice motorways.

Table 19 4 - Development of traffic intensity in years 2010-2015, Slovensko

Section	Road No	District	Year	PN2	N3	PN3	NS	Overall
Makov - Žilina								
Št. hr. SR/ČR – Makov	10	CA	2010	-	-	-	-	4851
			2015	28	20	39	477	3908
Makov - Kolárovice	10	CA	2010	19	615	43	506	4978
			2015	48	19	36	612	5333
Kolárovice - Petrovice	10	CA	2010	14	558	28	464	4235
			2015	28	35	58	592	4216
Petrovice – Bytča, sever	10	BY	2010	14	553	34	435	4366
			2015	56	22	42	689	4324
Bytča, sever – Bytča, kruhový objazd	10	BY	2010	20	606	25	509	7632
			2015	27	180	69	481	7598
Bytča, kruhový objazd – Bytča, most	10	BY	2010	25	673	33	472	5040
			2015	45	168	46	392	10144
Bytča, most – križovatka Hlboké nad Váhom	61	ZA	2010	28	824	39	600	7484
			2015	37	368	69	279	6374
križovatka Hlboké nad Váhom – Dolný Hričov	61	ZA	2010	31	813	30	607	7458
			2015	32	377	26	364	6966
Dolný Hričov – Hričovské Podhradie	61	ZA	2010	18	818	36	581	6552
			2015	38	268	32	437	6370
Hričovské Podhradie – Žilina, Strážov	61	ZA	2010	21	925	42	575	7676
			2015	48	420	51	408	7984
Bytča, most – Bytča (cestný privádzač na diaľnicu D1)	507	BY	2010	16	569	14	370	4754
			2015	21	186	63	311	7321
Bytča –Dolný Hričov	D1	BY	2010	47	2479	127	2167	23674
			2015	167	271	126	2777	23956
Dolný Hričov – Žilina, Strážov	D1	ZA	2010	57	2325	146	1989	23239
			2015	168	234	101	2832	23579
Žilina, Strážov – Žilina, Kragujevská	61	ZA	2010	151	3801	222	2844	35638
			2015	145	538	215	2480	28413
Svrčinovec - Žilina								
Št. hr. CZ – Svrčinovec (št. hr. SR/ČR-križ. I/11 a I/12)	11	CA	2010	47	2176	152	1872	8906
			2015	69	71	165	2199	7972
Svrčinovec – Čadečka (Križ. I/11a I/12-hranica k.ú. Čadca)	11	CA	2010	170	2143	143	1798	13240
			2015	88	358	228	2286	11465
Čadečka (Čadca) – Čadca (križ. II/487 Májová-križ. ul. Slov. Dobrovoľníkov)	11	CA	2010	28	2554	64	2292	20279
			2015	106	388	124	2131	18743
Čadca-Oščadnica*(križ. ul. A Hlinku – križ. III/01159 Oščadnica)*	11	CA	2010	9	329	21	186	5615
			2015	12	167	28	199	7066
Čadca – Horelica *(križ. Bukov Čadca -križ. Krásno nad Kysucou)*	11A	CA	2010	0	2119	43	2010	14759
			2015	118	303	144	2213	15053
	11	CA	2010	12	553	33	300	6954

Horelica – Krásno nad Kysucou*(križ. III/01159 Oščadnica -križ. II/520 KNK)*			2015	31	94	50	446	6434
KNK – Kysucký Lieskovec *(križ. KNKkriž.Skačkov)*	11	CA	2010	176	2638	307	2105	15281
			2015	111	330	179	2140	14176
Kysucký Lieskovec - Povina	11	KNM	2010	176	2638	307	105	15281
			2015	60	198	107	1800	14186
Povina - Budatínska Lehota	11	KNM	2010	48	2389	282	1866	17264
			2015	113	215	175	2479	13886
Budatínska Lehota - Radoľa *(križ. I/11 Budatínska Lehota - III/2052 Radoľa)*	11	KNM	2010	60	2749	244	2181	22953
			2015	86	260	102	2390	19308
Radoľa - ZA	11	ZA	2010	31	2807	161	2196	22772
			2015	67	326	84	2310	20145
Skalité - Svrčinovec								
Št. hr. SR/ PL – Skalité	12	CA	2010	131	38	2	3	2080
			2015	7	62	5	20	1411
Skalité – Svrčinovec *(križ. I/11 Svrčinovec –Čierne)*	12	CA	2010	2	74	1	21	3536
			2015	11	104	7	72	3446

Source: Celoštátne sčítanie dopravy r.2010 a 2015, Slovensko

Annual average daily profile intensities (CSR / 24h) for 2015 are broken down into PN2 for lorries with payloads between 3.5t and 12t, N3 and PN3 are trucks with a payload over 12 tonnes and NS as a semi-trailer. The sum of all vehicles includes counting cars, trucks, motorcycles.

Road transport - Year 2030

The Technical Conditions, forecasting the prospects for the road network by 2040 (issued in 2013), outlines the forward growth rates of road traffic intensity up to 2040. The R5 speedway is the route between St. the border of the CR / SR Svrčinovec and the intersection with D3. The transport of the future R5 is realized on the I / 11 road, for reasons of this reason (to the moment of operation of the R5 speed path and consequently to the newly established corresponding growth coefficients) it is necessary to calculate the intensification of this speed path as in the firstclass roads. The following table shows the road traffic intensity values up to 2030 GWC, which are calculated on the basis of the projected road transport intensity ratio.

Table 5 - Predicted road traffic intensity until year 2030 ŽSK, SR

Section	Road No	District	PN2	N3	PN3	NS	Overall
Št. hr. SR/ČR - Makov - Bytča							
Št. hr. SR/CZ – Makov	10	CA	57	23	43	732	6710
Makov - Kolárovice	10	CA	33	42	69	708	5294
Kolárovice - Petrovice	10	CA	67	26	50	824	5424
Petrovice - Bytča, sever	10	BY	23	121	18	683	7626
Bytča, sever – Bytča, kruhový objazd	10	BY	32	215	83	575	9567
Bytča, kruhový objazd – Bytča, most	10	BY	54	201	55	469	12813
Bytča, most – Križ. Hlboké nad Váhom	61	ZA	44	440	83	334	8027
Križ. Hlboké nad Váhom – Dolný Hričov	61	ZA	38	451	31	435	8774

Dolný Hričov – Hričovské Podhradie	61	ZA	45	321	38	523	8020
Hričovské Podhradie – Žilina, Strážov	61	ZA	57	502	61	488	10056
Bytča, most – Bytča (cestný privádzač na diaľnicu D1)	507	BY	24	214	72	358	9122
Bytča –Dolný Hričov	D1	BY	246	400	186	4096	37650
Dolný Hričov – Žilina, Strážov	D1	ZA	248	345	149	4177	37052
Žilina, Strážov – Žilina, Kragujevská	61	ZA	173	644	257	2967	35782
Št. hr. SK/CZ – Svrčinovec - Žilina							
Št. hr. CZ – Svrčinovec (št. hr. SR/ČR-križ. I/11 a I/12)	11	CA	83	85	197	2631	9928
Svrčinovec – Čadečka (CA), (Križ. I/11a I/12-hranica k.ú. Čadca)	11	CA	105	428	273	2735	14324
Čadečka (CA) – Čadca (križ. II/487 Májová-križ. ul. Slov. Dobrovoľníkov)	11	CA	127	464	148	2549	23566
Čadca-Oščadnica *(križ. ul. A Hlinku – križ. III/01159 Oščadnica)*	11	CA	14	200	33	238	8929
Čadca – Horelica *(križ. Bukov Čadca - križ. Krásno nad Kysucou)*	11A	CA	141	362	172	2647	18886
Horelica – Krásno nad Kysucou*(križ. III/01159 Oščadnica -križ. II/520 KNK)*	11	CA	37	112	60	534	8112
KNK – Kysucký Lieskovec *(križ. KNK križ. Skačkov)*	11	CA	133	395	214	2560	17775
Kysucký Lieskovec - Povina	11	KNM	72	237	128	2153	17830
Povina - Budatínska Lehota	11	KNM	135	257	209	2966	17391
Budatínska Lehota –Radoľa,*(križ. I/11 Budatínska Lehota - III/2052 Radoľa)*	11	KNM	103	311	122	2859	24276
Radoľa - Žilina	11	ZA	80	390	100	2763	25341
Št. hr. SR/PL - Skalité - Svrčinovec							
Št. hr. SR/PL – Skalité	12	CA	8	74	6	24	1782
Skalité – Svrčinovec *(križ. I/11 Svrčinovec –Čierne)*	12	CA	13	124	8	86	4354

Railway transport - Year 2018

Through the Slovakia, four multimodal transport corridors are taking place, linking Europe in important directions north - south, west - east and towards the Balkans. Two TEN - T Core Multimodal Corridors (TEN - T CORE Network) are going through the region of Žilina, which will constitute the main priority framework for the development of a sustainable multimodal European transport network by 2030, namely:

Baltic - Adriatic Corridor: Gdynia - Gdansk - Katowice - Ostrava - Brno - Vienna; Katowice - Bialsko Biala - Žilina - Bratislava - Viedeň - Graz - Trieste - Koper and Trieste - Venice - Bologna - Ravenna, Zilina Region (Zilina - Bytča) line number 106), Čadca - Zwardoň (line number 114), highways D1, D3, part of the speed route R3 from Martin to the southern border of the region and the planned Vážská vodní cesta,

Corridor Rhine - Danube: Přerov - Ostrava - Žilina; Zlin - Zilina and Zilina - Košice - the

border with Ukraine, in Zilina Region: railway line Zilina - Vrútky - Ružomberok - Liptovský Mikuláš - Liptovský Hrádok - Važec (trace 106, 105) and D1 motorway.
The total number of freight trains in selected sections is shown in the:
Infrastructure capacity chart for GVD 2017/2018 with a view to 2019, Slovakia.
Within the section Žilina - Čadca št. hr. for the year, the operating value was 779,296.17 thousand hrtkm. The anticipated development of freight transport, the amount of goods transported and the performance of each mode of transport will generally increase, with road freight being dominant.

Table 6 - Selected indicators of rail freight transport in sections, Slovakia

Line	Section	Train kilometres[vlkm]		Operational performance[tis.hrtkm]	
		P	N	P	N
106D	Žilina - Čadca št. hranica	227 689,73	234 251,77	423 340,65	355 955,52
114B	Čadca – Skalité št. hranica	802,34	1 611,60	1 187,82	2 123,68
106A	Kraľovany - Púchov	529 054,98	517 971,85	968 342,65	703 423,76

Source: ŽSR

The increase in rail freight transport is reflected mainly on the main corridors and road freight, motorways and express roads (planned) in regions with higher economic potential.

Water transport
In the framework of the ŽSK water transport, the transport of goods by water is not considered, as there are no navigable waterways in the WSS and their planned development is not in the horizon until 2030.

7.2. Reducing financial costs when using a waterway

7.2.1. Czech republic

Description of the potential for the transfer of freight from road to water by means of average prices for the transport of 1 tonne of cargo by water transport and by road and the price for transshipment of 1 tonne of cargo in the road (rail) - water terminal.

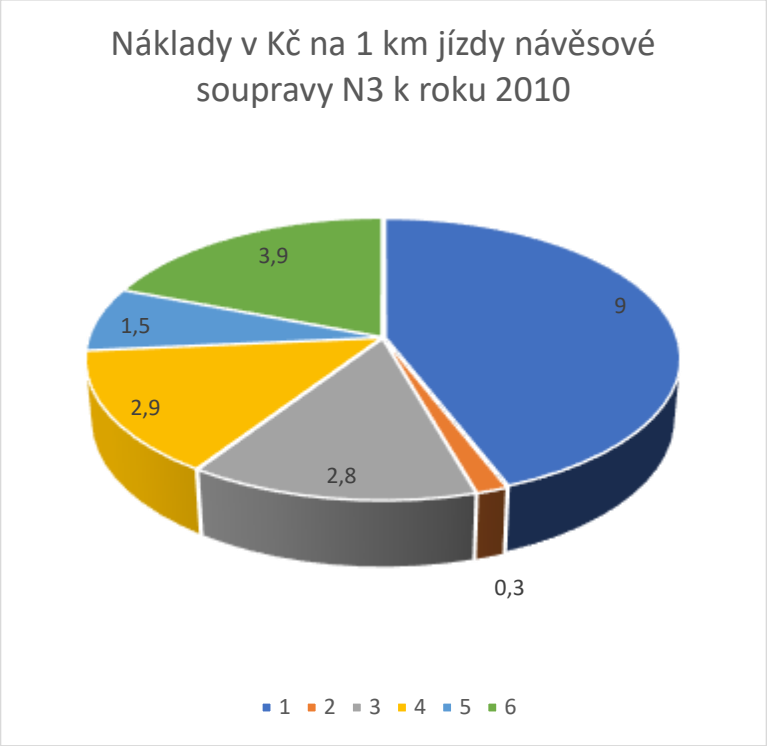
By the text below, road transport will be the most burdened by wage growth in the future

Table 22 - Transport costs 1 tonne (door to door)

	2018	Prediction 2030 including externalities
Road	0,95 Kč for the load weight 25 tons	1,20 Kč
Railway	1,10 kč (+ 15% road costs 2018)	1,30 Kč
Water	0,80 Kč	0,85 Kč

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

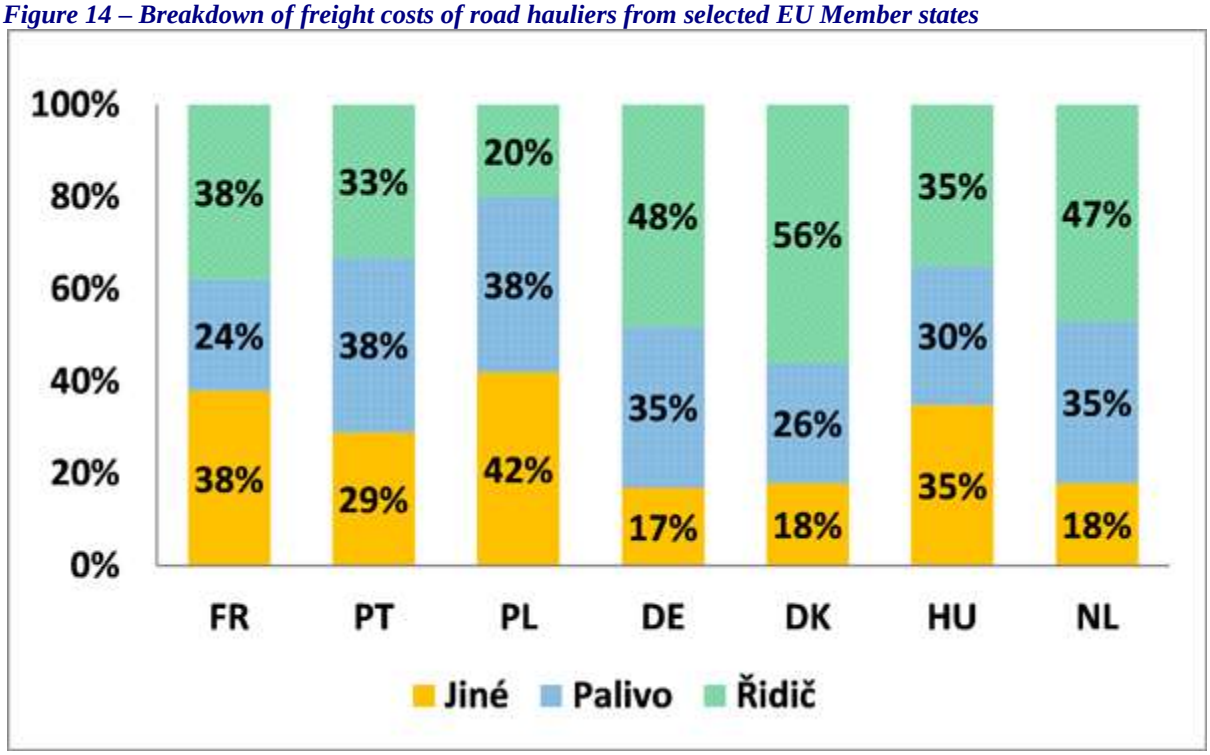
Figure 13 – Freight transport costs for truck in CZK



fuel	9,0
other material	0,3
wages	2,8
Depreciation, leasing	2,9
Repairs, maintenance	1,5
Taxes, toll, insurance	3,9

Cost structures are getting closer to the road freight sector. The relative importance of the two major cost drivers (labor and fuel costs) has now reached comparable levels throughout the EU. In 2004, labor costs in the Member States that acceded to the EU in the same year were between 10% and 30% of total costs, since then they have grown and represent between 20% and 40% of costs in these Member States. In absolute terms, labor costs in the Member States that acceded to the EU in 2004 and 2007 remain lower than those in the EU-15 Member States, but this gap continues to diminish. Differences in fuel costs range from 24% to 38% of total costs.

Figure 14 – Breakdown of freight costs of road hauliers from selected EU Member states

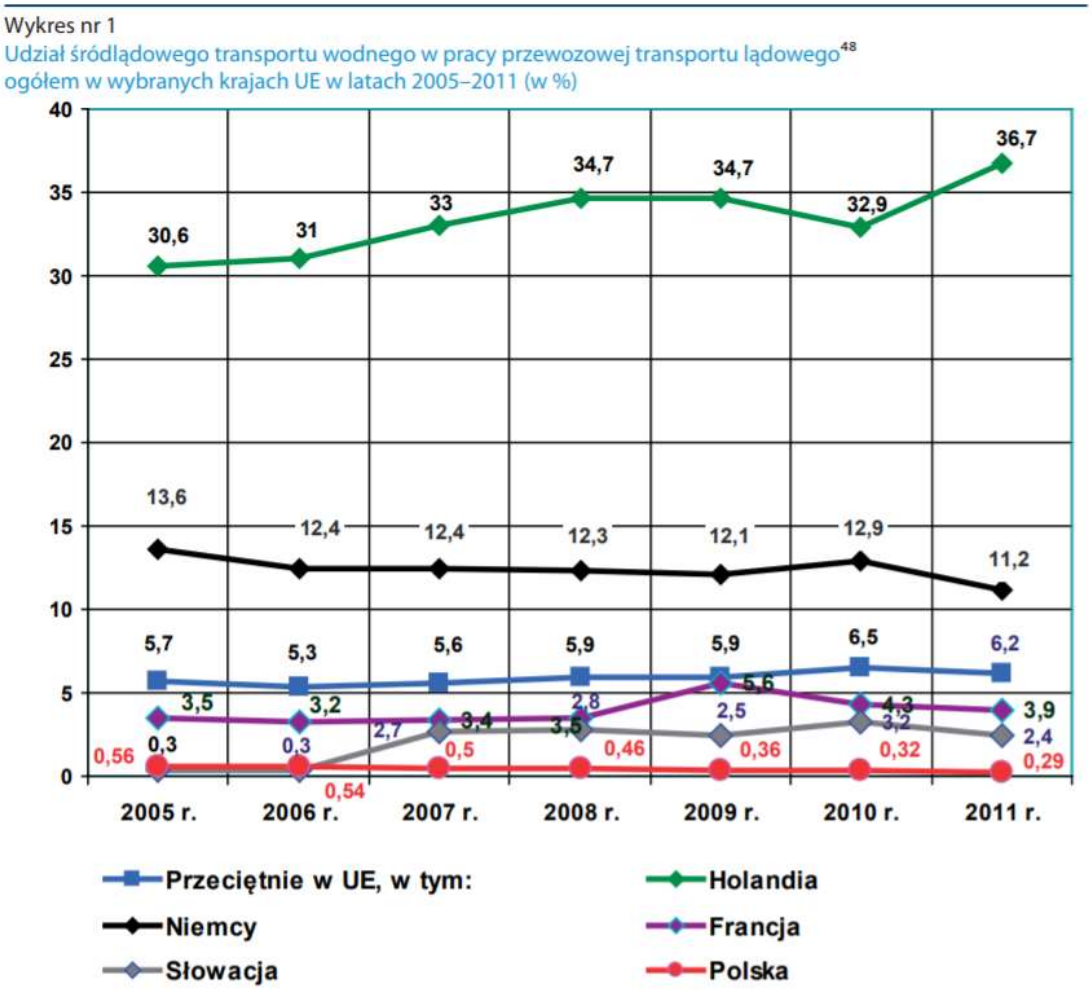


Source: Collection and Analysis of Data on the Structure of the Road Haulage Sector in the European Union (AECOM 2013).

7.2.2. Poland

The development of inland waterway transport in Poland is a great chance to relieve road transport, which currently accounts for 86% of transport in Poland, with only 0.4% for water transport. This is important primarily due to the obligations of the so-called White Paper (Roadmap to a Single European Transport Area issued in 2011 by the European Commission). According to it, by 2030 30% of road transport of goods at distances greater than 300 km should be transferred to other means of transport, eg water transport or railway, and by 2050 it should be over 50% of this type of transport. In addition, according to this strategy, ports in Gdańsk, Gdynia, Szczecin and Świnoujście should have a connection to their backbone through inland transport. rivers are the most economical transport, they allow to reduce fuel consumption and pollutant emissions with which Poland has a serious problem. Poland ranks as the European leader in air pollution, and road transport is the main responsible for transport emissions (72.8%). CO2 emission in the case of shipping is only 33.4 g / tkm, while in road transport - 164 units, and in turn - 48.1. (results from the Poland 3.0 concept data).
In addition, river transport is 30 percent. cheaper than the railway. This is confirmed by the data of the Ministry of Infrastructure: a liter of fuel allows you to move a river ship over a distance of one kilometer as much as 127 tons of cargo, while the car only 50 tons, and by rail 97 tons.

Figure 15 – Volume of freight waterway transport in EU and selected members



7.2.3. Slovakia

On the Slovak side of the TRITIA area there will be no reduction of the freight costs of the water carriers, as we do not envisage the operation of the inland waterways (Váh) in the time period until 2030.

7.3. The formation of bottlenecks in other modes of transport

Notice to chapter: Road - Year 2030 – will be updated according to D.T3 transport model.

Table 23 - 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 24 - 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

7.3.1. Czech republic

Road - Year 2018

Insufficient roads capacity and congestion

In the Czech part of the TRITIA region (the Moravian-Silesian Region), 2018 on the main transport routes do not create bottlenecks from congestions with the exceptions:
- Rudná and Místecká streets in Ostrava at the time of narrowing of the road profile in traffic signs
- passage through Ostrava Poruba on the street on November 17, to be removed by the ongoing byway
- passage through Frýdek-Místek, which is solved by the ongoing construction of the bypass

However, these constraints cause transport to be delayed for minutes or no more than tens of minutes at peak peak hours. It is not possible to take these sites as essential for choosing a road freight transport route.

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 25 – 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.

Railway – Year 2018

At present, the main restricting elements on the railway infrastructure infrastructure in the Czech Republic are specifically in the Moravian-Silesian Region:

- low track capacity
- capacity-limited terminals of intermodal transport

The busiest section of the monitored area is located in Ostrava's railway junction, where several lines are connected and there is relatively dense suburban traffic. There are two railway co-drivers. It is Corridor No. II Zebrzydowice (PL) - Ostrava - Přerov - Břeclav - (SK, A) and corridor No. III (D) - Cheb - Prague - Přerov - Ostrava - Čadca (SK). In the area we are seeing, we can specify two restrictive sections. These are the Ostrava-Svinov-Ostrava-Mar.Hory and Ostrava-Hrušov-Bohumín-Vrbice sections.

Terminals of intermodal transport are currently insufficiently capacitive. The container terminal of Paskov currently has a capacity of 2400 TEU. Terminal Mošnov (siding ZCOM) is currently under construction.

At present, rail freight transport in the MSK on the main line is used almost to the maximum. The limiting element is the Ostrava railway junction. In the restrictive section of Bohumín-Vrbice - Ostrava-Hrušov, a total of 127 regular freight trains and 9 freight trains are scheduled for 2018 in a valid GVD for 2018, in both directions in one day. There are also 27 free train paths for college number 2 and 53 free train paths for track No. 1 per day. For peak traffic there are 1.5 train tracks for track No. 2 and 4.5 train tracks for track No. 1. Here you can see a really busy inter-stationary section that is a crystalline place on the SŽDC network in MSK in case of delay or extraordinary event.

In the line section of Přerov - Ostrava there is a limiting cross - section section Polom - Hranice na Moravě, where there are currently 148 regular freight trains and 7 freight trains as needed in both directions per day. In this inter-station section, there are plenty of free routes to increase trains of freight trains.

In the border section (corridor No II.) Dětmarovice - Petrovice u Karviné (Zebrzydowice PL) there is no problem with the possibility of increasing the number of train paths. At present, there are 73 regular freight trains and 2 train routes as needed in both directions in one day. There is more than one hundred free train trains per day for each track. In the border section (corridor No. III) (Svrčinovec zast. SK) Mosty u Jablunkova - Dětmarovice is not a problem with the increase of the train paths as in the previous case. In the restrictive section of Český Těšín - Třinec, where 67 regular freight trains and 16 train routes are trashed as needed in both directions in one day. There are more than 90 free train paths for one trackin this inter-station section.

Figure 16 – Bottlenecks and container terminals in Moravian-Silesian region

From the chart above, there are individual bottlenecks on other carriers' networks. The most limiting sections on the SŽDC network are A1 and A2. Significant terminals of intermodal transport are shown at points B1 and B2.

Railway - Year 2030 – according to model

In the outlook for 2030, it is possible to consider increasing constraints due to insufficient track capacity. In the context of increasing transport in MSK, technical modifications of the railway infrastructure are proposed, which will eliminate the missing capacity of the railway line (see the Ostrava Node study).

In the future, it is possible to consider up to 6-8 thousand TEUs in the Paskov container transport terminal.

The current capacity of the terminal is 2400 TEU. After the construction of another part of the terminal (which should take place in the first half of 2018), the capacity should increase to 4000 TEU (in operation since the second half of this year). The extension of the terminal includes extensive paved areas (20000 m2) and the construction of two new relay tracks.

In the next years (around 2025), AWT intends to extend the terminal further east of the sink station (in places where the technology stands and the coal). Here, the prospective capacity

after 2025 can only be estimated at about 6 to 8 thousand TEUs (but that's more likely to be the case).
Another of the bottlenecks within the container transport terminal Mošnov (siding ZCOM). At present, work is under way to build an intermodal transport terminal and a logistics center in the Mošnov industrial zone. At present, we can only use existing transport in section Studénka - turnout No. 201, which will be connected to the SŽDC railway network (ZCOM siding).
Upon completion of the terminal and logistics center, a summary of the capacity assessment of the infrastructure is provided. On the basis of the capacitive calculations made it is clear which elements become limiting for the range of traffic transported by rail for the needs of the Mošnov terminal.
- Single track line Studénka - Sedlnice on SŽDC network
- The container terminal in the ZCOM siding circuit is designed to unload and load container wagons under the gantry crane (not for technical and commercial trains).
- The capacity of the container terminal group (KT) will also serve the needs of the Logistics Center (LC).
- Railway station Studénka on the SŽDC network is a limiting element. The station has a single rail for the movement of freight trains in the direction of ZCOM (the second 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).

7.3.2. Poland

In Poland, systematically every five years since 2000 (previously, research has been carried out 4 times since 1926), General Movement Surveys are being conducted. In 2015, the measurement included a network of national roads managed by the General Directorate of National Roads and Motorways with a total length of 18022 km. The average traffic of motor vehicles (SDRR) in 2015 on the national road network amounted to 11,178 vehicles / day.

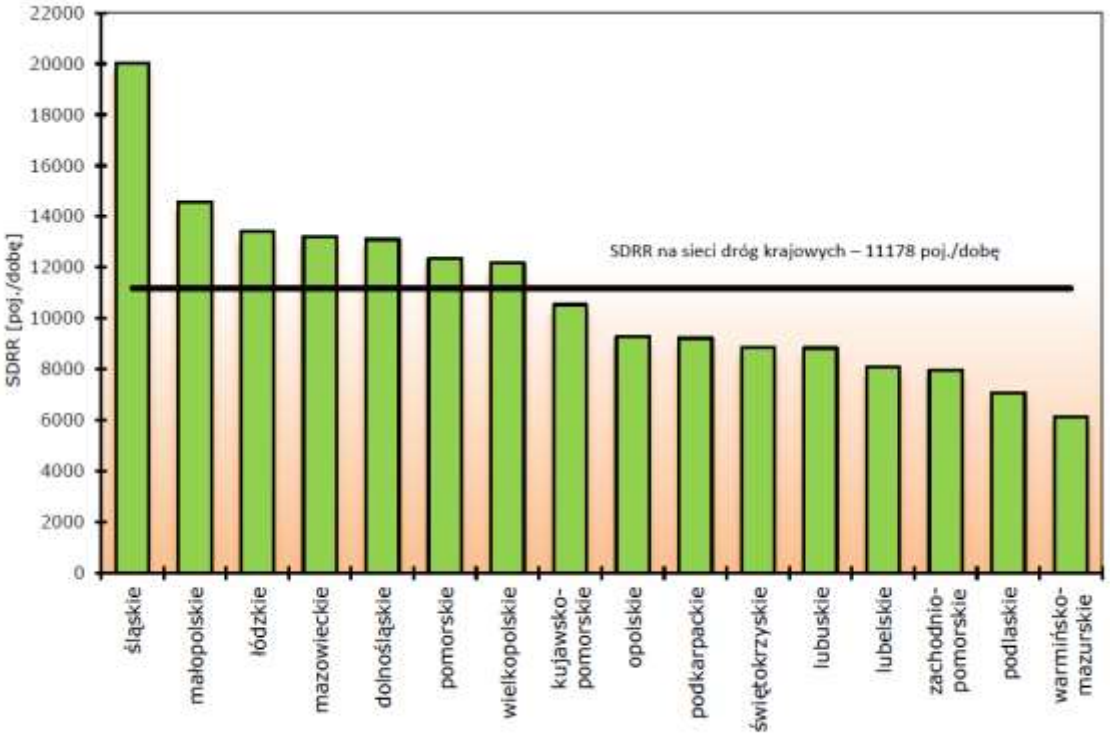
Table 26 – presents the results characteristic for individual voivodships.

Lp.	Województwo	SDRR 2015 (poj./dobę)		
		krajowe	w tym:	
			międzynarodowe	pozostałe
1	dolnośląskie	13098	20065	7029
2	kujawsko-pomorskie	10531	16877	8198
3	lubelskie	8100	**10660**	6833
4	lubuskie	8840	14509	5769
5	łódzkie	13415	25240	7211
6	małopolskie	14580	25280	10099
7	mazowieckie	13208	26704	7616
8	opolskie	9269	30155	6506
9	podkarpackie	9226	11296	8025
10	podlaskie	7082	10981	5897
11	pomorskie	12352	23269	7519
12	śląskie	**20017**	**38848**	**13409**
13	świętokrzyskie	8844	13467	7354
14	warmińsko-mazurskie	**6133**	13607	**5142**
15	wielkopolskie	12171	20835	9501
16	zachodniopomorskie	7954	13160	5534
KRAJ		**11178**	**20067**	**7614**

Wartości maksymalne i minimalne w poszczególnych kolumnach tabeli zostały wyróżnione

The largest traffic load, amounting to more than 20,000 vehicles / day, occurred in the Śląskie Voivodship. The smallest traffic load on the national road network, below 8,000 vehicles / day, occurred in the following provinces: Warmińsko-Mazurskie, Podlasie and Zachodniopomorskie. In the province Opolskie SDRR is over 9,000 vehicles / day. On international roads, by far the largest traffic, on average over 38,000 vehicles / day, was in the Śląskie Voivodeship. A very heavy load on the international road network, amounting to over 25,000 vehicles / day on average, also occurred in the Opolskie Voivodeship. Arranging provinces in terms of the total SDRR of motor vehicles in 2015 on the national road network is shown in figure below.

Figure 17 – Average daily traffic of motor vehicles on national roads of 2015 year in Poland



Rys. 1. Średni dobowy ruch roczny (SDRR) pojazdów silnikowych w 2015 roku na sieci dróg krajowych w kraju i w województwach

Table 27 – presents data on the average daily motor vehicle volume (SDRR) in 2015 on individual international roads E.

Numer drogi E	SDRR 2015 (poj./dobę)
E-28	18029
E-30	24031
E-36	14786
E-40	28870
E-65	14195
E-67	21802
E-75	26562
E-77	20596
E-261	17114
E-371	9689
E-372	13329
E-373	10597
Drogi E	**20067**

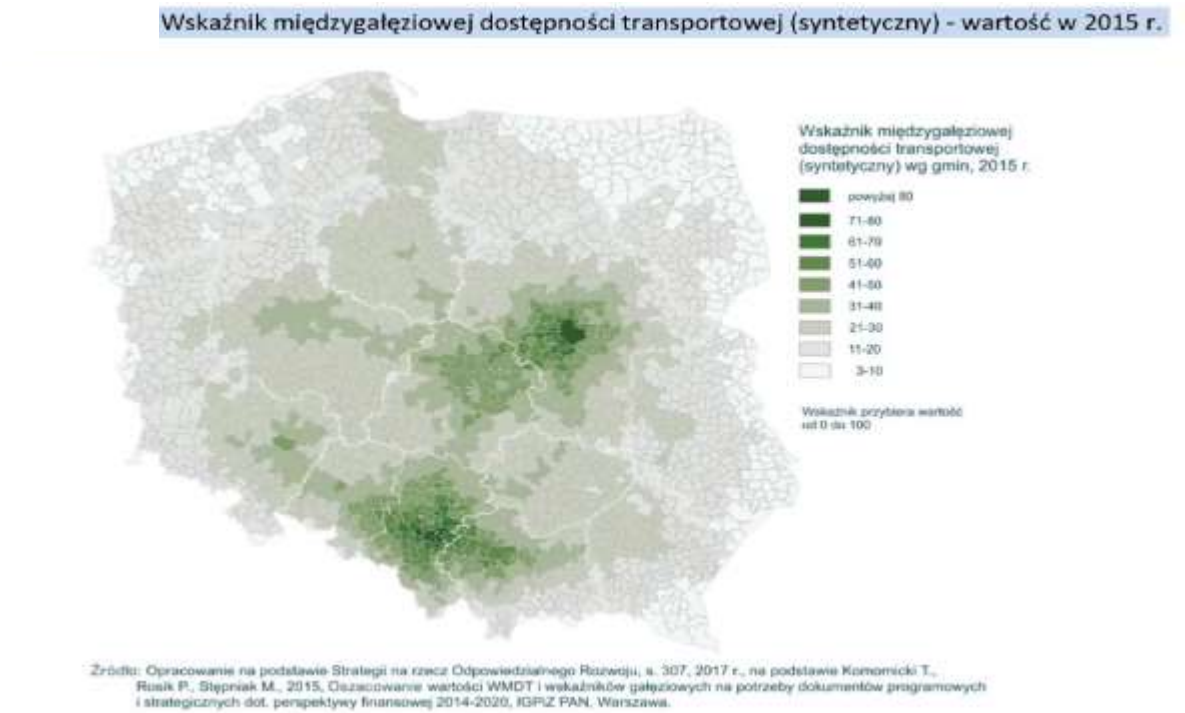
In 2015, the most intensive were the international roads E-40 (A4) and E-75 (S1, A1), on which the average daily annual traffic exceeded 25,000 vehicles / day. In 2015, the largest traffic was recorded on the roads of national technical classes A and S. SDRR on these roads amounted to 26509 vehicles / day and 21232 vehicles / day respectively. Traffic on motorways was more than twice, and on expressways almost twice as large as SDRR for the entire national road network.
The most-loaded sections of national roads, on which the SDRR in 2015 exceeded 100,000 vehicles / day were:
road No. S8f, section of the AK Route in Warsaw from the Prymasa Tysiąclecia Node to the Marywilska Junction, SDRR from 127822 to 142269 vehicle / day,
road No. S86, section Sosnowiec - Katowice, SDRR = 112212 vehicle / day,
road no. S8f, section Marywilska junction - Łabiszynska junction, SDRR = 110395 vehicles / day,
A4 motorway, Katowice (crossing), SDRR = 100983 vehicles / day.
In all voivodships an increase in traffic on national roads between 4 and 26% was recorded in the period 2010-2015. The largest increase in traffic, over 20%, was recorded in the following provinces: Łódzkie, Kujawsko-Pomorskie, Małopolskie and Śląskie. In the province the Opolskie increase is about 10%.
The length of national roads divided into tourist and recreational functions as well as the nature of traffic in 2015 are presented in the table.

Table 28 – length of national roads divided to tourist-recreational and economic funkction

Charakter ruchu	Długość dróg					
	krajowe		w tym: międzynarodowe		pozostałe	
	km	%	km	%	km	%
Gospodarczy	16966	94,1	4720	91,5	12246	95,2
Turystyczno-rekreacyjny	1056	5,9	438	8,5	618	4,8

Saturation of the Polish area with transport infrastructure and a functioning transport service system determine one of the most important features of the economic system, which is the country's transport accessibility. The given place is all the more transportable, the more other places you can reach safely, cheaply and efficiently. Research shows that the best inter-branch transport accessibility was recorded in 2015 in the following voivodeships: **Śląskie**, Mazowieckie, Łódzkie, **Opolskie** and Małopolskie.

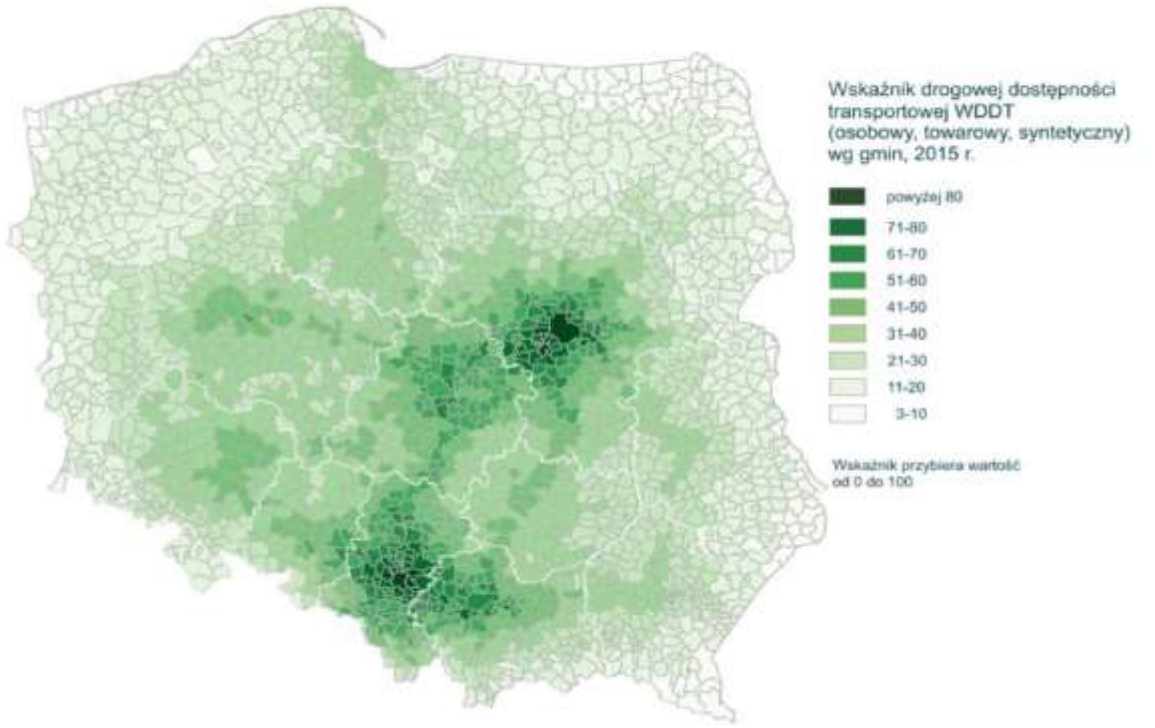
Figure 18 – Indicator of interchain accessibility of 2015 year in Poland



In 2015, the road network in Poland was characterized by the existence of two poles with the best road accessibility: Warsaw-Łódź and Kraków-Górnośląskie, spreading from along the A2 and A4 motorways. A change of road access was also influenced by the A1 motorway (see figure).

Figure 19 – Indicator of road accessibility of year 2015 in Poland

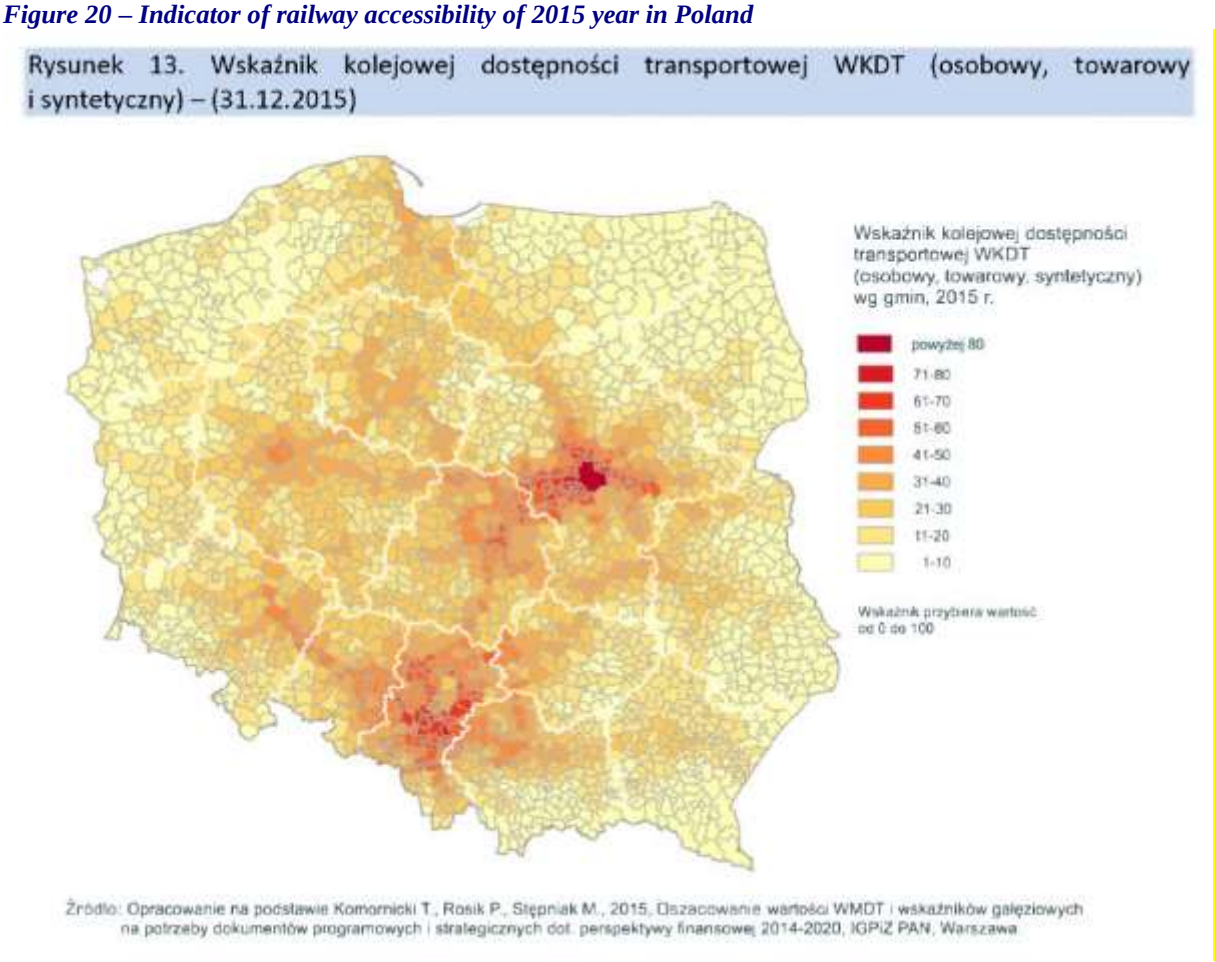
Rysunek 12. Wskaźnik drogowej dostępności transportowej WDDT (osobowy, towarowy i syntetyczny) – wartość docelowa (31.12.2015)



Źródło: Opracowanie na podstawie Komornicki T., Rosik P., Stępniak M., 2015, Oszacowanie wartości WMDT i wskaźników gałęziowych na potrzeby dokumentów programowych i strategicznych dot. perspektywy finansowej 2014-2020, IGPiZ PAN, Warszawa.

A slightly different spatial image is obtained by analyzing railway accessibility to regional centers in 2015. Although the length of railway lines is relatively high compared to other EU countries, most of the major agglomerations are not connected by a network enabling the passage of passenger trains with an average technical speed above 160 km / h. In 2015, 10 out of 18 provincial cities were connected by railway lines modernized to at least average speed of passenger trains 100 km / h23. The compact area with relatively good railway accessibility parameters covers the major part of central, southern and western Poland. The biggest changes in railway accessibility are visible in the connections between the main urban centers, especially between Warsaw and Gdańsk, Łódź and Katowice / Krakow, as well as between Wrocław and Katowice.

Figure 20 – Indicator of railway accessibility of 2015 year in Poland



The analysis of traffic jams on the roads of the Śląskie and Opolskie Voivodships showed that the cause of traffic jams is most often accidents or repairs. They are not permanent constraints. The research was based on road analyzes (see figure) provided by websites: mapa.targeo.pl and korkowo.pl. Roads indicated on the map include two surveyed voivodships.

Figure 21 – Legend for figures 22 a 23

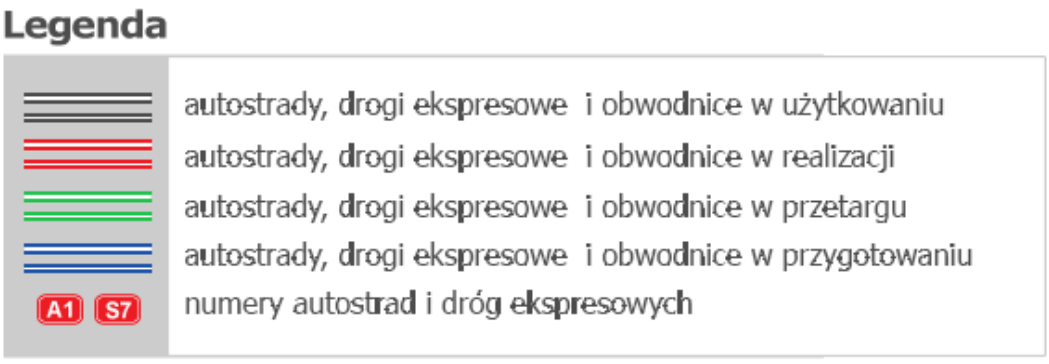


Figure 22 – Main road network in Silesian voivodeship

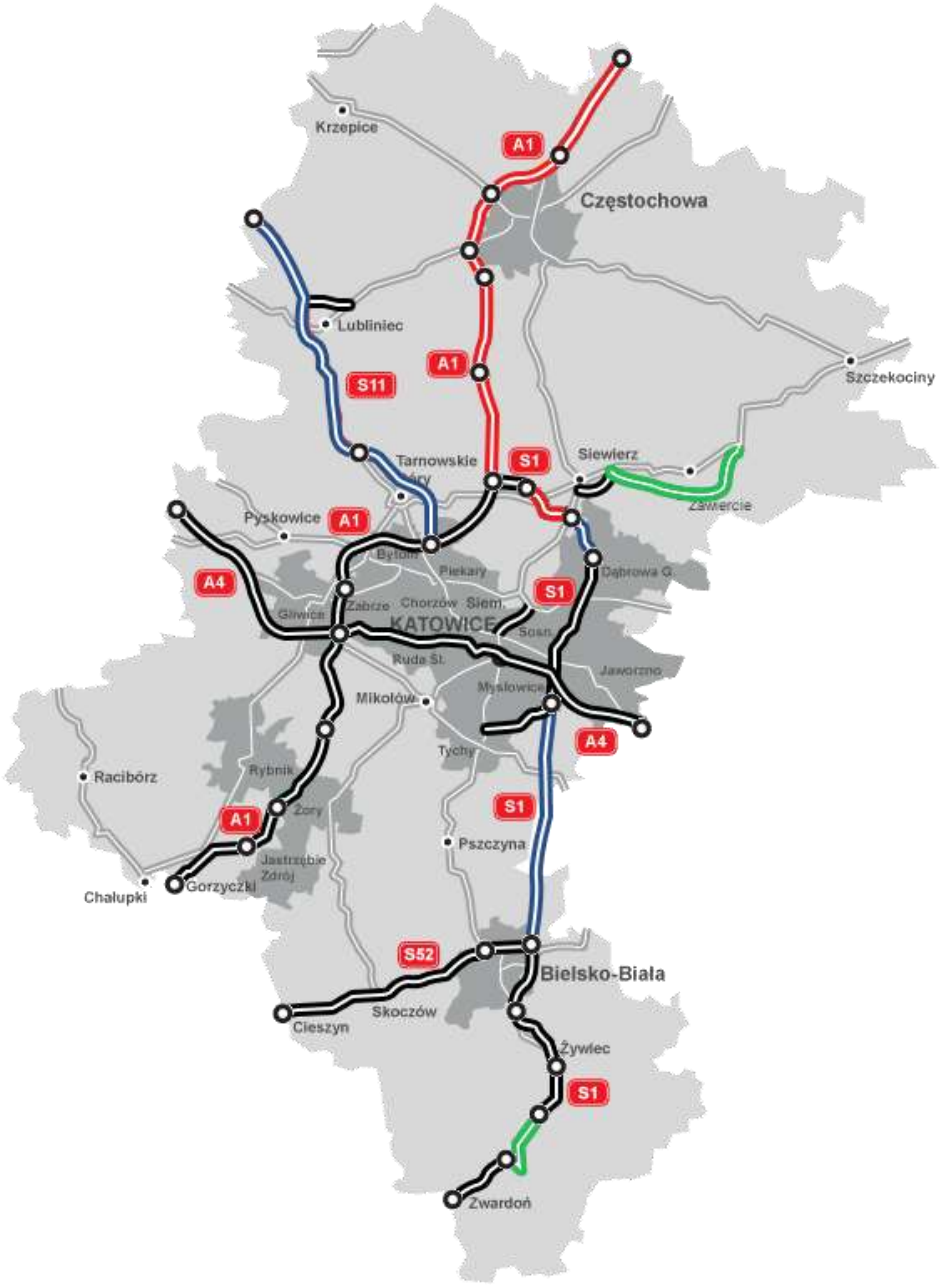
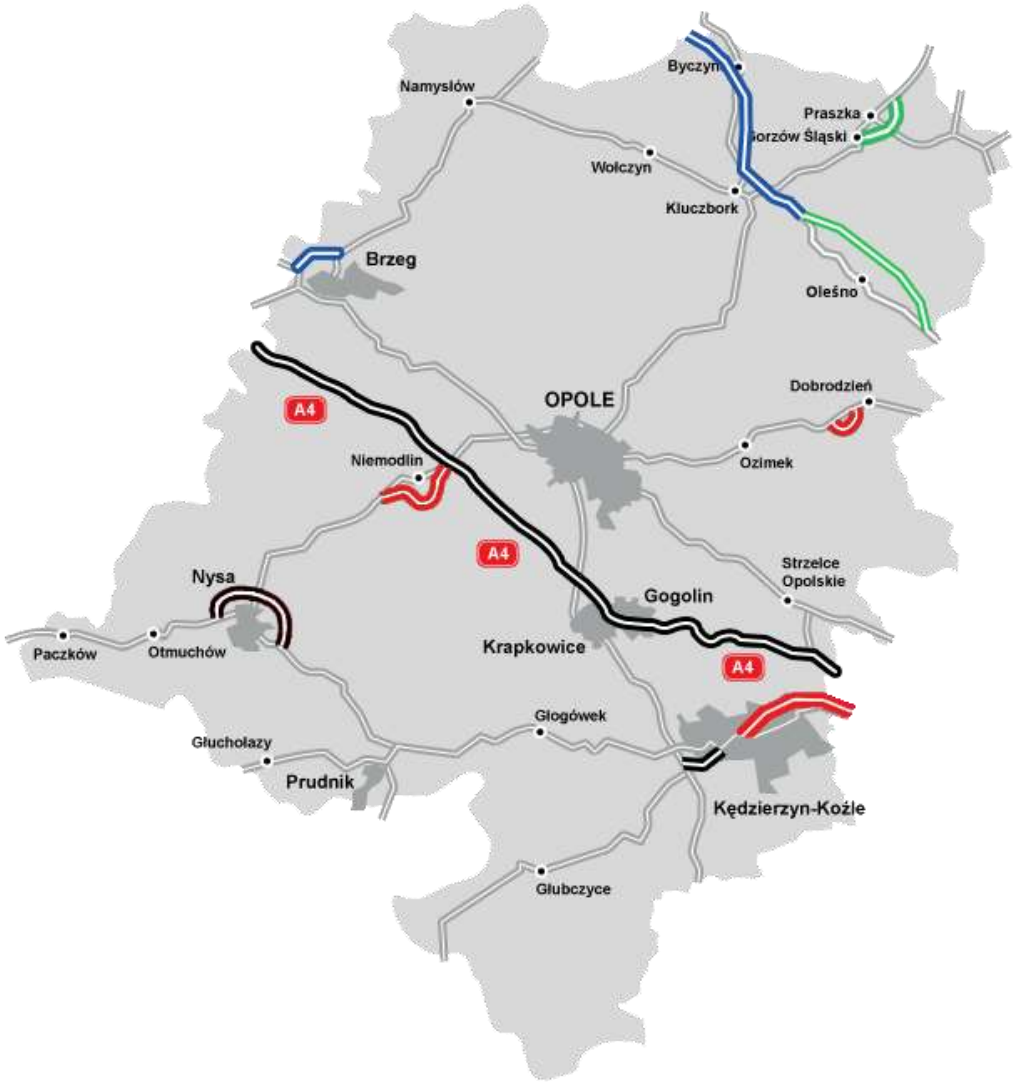


Figure 23 – Main road network in Opole voivodeship



7.3.3. Slovakia

Road

Transport congestion may be a source of multiple societal risks, such as the psychological aspects of the behavior of the participants in the transport process, the time lost and the associated increased costs, higher energy intensity and negative impact on the environment, lower accessibility of the area. At present, the trend in road transport is causing traffic congestion, more frequent incidents of traffic accidents and increased volumes of emissions of polluting emissions in large agglomerations and sections with high daily average intensities or increased intensity during peak hours during the day. Accidental location is located in the wider area of the intersection intersection of roads I / 18 and I / 11

in Zilina, ie crossing the main roads of the multimodal European corridors Baltic - Adriatic, Rhine - Danube on the territory of Slovakia. This phenomenon also manifests itself at the entrances to places where there are capacities and categorically different roads, which naturally create bottlenecks in infrastructure. A narrow place within ŽSK is the unfinished highway D3 and the R5 expressway in the section Žilina - Čadca - št. border SR / CZ with planned intersections. The construction of the D3 motorway and the R5 expressway is also necessary in view of the Zilina - Nošovice capacity road connection, in connection with cooperation and the need to secure mutual supplies between KIA Slovakia Žilina and HYUNDAI Nošovice.
The construction of the D3 motorway will make the two largest Kysucké Nové Mesto and Čadca districts with the regional city of Žilina smoother, faster and more secure, which will also improve the overall transport conditions for transit traffic on this important Slovak road in the north direction - south. The following table shows the realities of the construction dates for NDS motorway sections according to INEKO.

Table 29 – Construction of the D3 motorways and the R5 expressway

Section	Start of operating	Predicted start of building	Predicted finish of building (start of operating)
D3			
Hričovské Podhradie – Žilina, Strážov	2008	-	-
Žilina, Strážov – Žilina, Brodno	2017	-	-
Žilina, Brodno – Kysucké Nové Mesto	-	2021	2024
Kysucké Nové Mesto – Oščadnica	-	2023	2026
Oščadnica – Čadca, Bukov	2005	-	-
	-	2021 *	2024 *
Čadca, Bukov – Svrčinovec	-	2017	2020
Svrčinovec – Skalité	2017	-	-
Skalité – št. hr. SR/PL	2017	-	-
R5			
Svrčinovec – št. hr. SR/CZ	-	2022	2025

Source: http://cesty.ineko.sk/ , (* state of preparation 2nd profile),

Suggested speedway R5 Svrčinovec - št. the SR / CZ border should complete the road network of this territory in order to interconnect the planned D3 motorway with the Czech Republic's road network. The highway should as far as possible ensure the road traffic safety in contact with the intravilan and, in particular, to select a highway transit traffic from urban transport. The city of Čadca is one of the narrowest places in ŽSK where, according to the national census in 2015, the day passes 18743 cars in 24 hours. Partly open issue is the completion of the highway junction Čadca / Podzávoz. The construction of the kysuce part of the D3 motorway (Čadca, Bukov - Svrčinovec) will bring a safer transport solution for Čadca and the surrounding villages, plus a comfortable connection between Slovakia and

the neighboring PL and CZ. Motorists will save you ride on the nearly 6-kilometer Čadca bypass 5 min.

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 30 – 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).

Railway

There are no more significant problems with the capacity (permeability) of track sections on the whole railway infrastructure. A narrow location on track sections may be the technical state of the railway infrastructure, associated low line speed, station and track guard status, long service intervals, etc. The overview of capacity utilization on each line segment is presented in the following table.

Table 31 – Average capacity utilization of track sections, SR

Line No	Section Name	Average capacity utilization	The shortest possible interval of regional trains (min)
106D	Čadca - Skalité	29%	30
	Skalité - Zwardoň PL	18 %	30
114D	Žilina – Čadca	48 %	15
	Čadca - Mosty u Jablunkova CZ	29 %	15
106A	Žilina -Púchov	64 %	20

Source: ŽSR

In the restrictive section of Žilina - Čadca, a total of 58 regular freight trains and 28 trains are required in both directions for one day in the valid GVD for 2017/2018. Inside this intersection, there are plenty of free train paths to increase the trains of freight trains. A narrow place is the Zilina node, where it is necessary to modernize the technical infrastructure of the railway line in order to achieve the parameters set by the AGC and

AGTC agreements. The use of line capacity in both directions together in the breakdown of passenger trains, freight trains together with the indication of remaining free capacity in the number of train paths is in the following table.

Table 32 – Infrastructure capacity for GVD 2017/2018 with a view to 2019, SR

Line No.	Section		Daily operating trains v GVD 2017/2018		Ad hoc trainsin GVD 2017/2018		Free capacity 2017/2018		Capacity		Perspective capacity 2019	
			P	N	P	N	P	N	P	N	P	N
106 D	Žilina - Čadca	OD	33	33	2	2	84	87	165	162	83	83
		ND	30	28	16	12						
	Čadca - Mosty u Jablunkova CZ	OD	22	22	0	0	123	123	172	175	78	106
		ND	22	26	5	4						
114 B	Čadca - Skalité	OD	10	8	0	0	67		95		78	
		ND	0	0	5	5						
	Skalité - Zwardoň PL	OD	7	7	0	0	62		76		97	
		ND	0	0	0	0						
106 A	Žilina -Púchov	OD	39	41	2	1	44	47	127	126	90	
		ND	33	26	9	11						

Zdroj: ŽSR Príloha 4.3.A https://www.zsr.sk/dopravcovia/infrastruktura/podmienky-pouzivania-zel-infrastruktury/podmienky-pouzivania-zel-siete-2018/

White Paper talks about 30 % shift from road freight transport at a distance of 300 km to other transport mode to 2030. In case of the monitored area of Žilina region in the shifting of the transported goods from the road transport to the railway transport is necessary to consider with sufficient track capacity. In the present on the track section Žilina – Čadca are available capacity in direction Žilina – Čadca 84 trains and Čadca – Žilina 87 trains, on the track section Skalité – Zwardoń (PL) 62 trains and on the track section Žilina – Púchov in direction Žilina – Púchov 127 trains and in direction Púchov – Žilina 126 trains. If we assume the assumption, that Slovak republic will meet the goal of the White Paper, thus it is necessary to consider with adequate capacity on the railway sections in 2030. When we consider with average load of freight vehicle 14 tonne, so on the basis of the estimate traffic volume in 2030 on the border crossing Svrčinovec – Mosty u Jablunkova is potential of goods shift around 12 629 tonne, on the border crossing Skalité – Zwardoń around 521 tonne and on the section Žilina – Bytča around 20 698 tonne. In case of railway transport we will consider with average 25 wagons train with average load of the wagon 25 tonne. Potential goods shifted to railway transport in 2030 is possible to serve on the section Žilina – Čadca – Svrčinovec by around 10 pairs of trains, on the section Čadca – Žwardoň by around 1 train and on the section Žilina – Bytča by around 16 pairs of trains. If we will consider with assumption, that the number of trains on the described track section in 2030 will be at the same level like now (decreasing in last years) is possible to state, that 30 % of good shifted from road freight transport to the railway transport will tracks handle from the capacity site.

7.4. Simplification of transport - acceleration for oversize

7.4.1. Czech republic

Table 33 – 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

The driving time of the Ostrava-Prague freight train is at best 12 hours, which is an average of 30 km / hour. – ČD Cargo, Bednárik, 11.10.2018, www.zdopravy.cz

Simplification

River transport is, in comparison with the road transport mode, exempted from measures that make transport on the road very complicated. They are for example:

- Assessments of road capacity and bridge structures
-Measurement of deformations during passages through bridges, their inspections
-Supporting and other reinforcement of bridges
-Dismantling of above-ground lines (power engineers, telecommunications, transport companies, railways)
-Adjustments of the passable profile (vegetation pruning, removal of columns, railings, vertical traffic signs, dumping ditches, laying sheet metal, lining edges of circular junctions with wood, etc.)

Acceleration

When assessing the speed criterion for each type of transport, it is possible to proceed from the information available to shippers carrying out oversize load by riverboats on the Elbe and the Danube where the average speed of the ship is about 5 km/h, but for faster ships, for example on the Danube up to 7 - 8 km/h. Of course, this speed depends on many factors, such as:

-Level state and generally navigability conditions on a particular watercourse
-Density of water transport
-Overall parameters of the boat, ship or boat set
-The necessity of ballasting for passing under bridges

On the other hand, for road transport of oversize load it would also be necessary to proceed from many circumstances to determine, estimate or specify the average speed. Road transport is limited by:

- Time limitation of passing through individual cities
- Time limitation prescribed by the licensing authority
- Schedule of transport
- Restrictions on the route in the form of closures, constructions, necessary measures, etc.
- Limited daily driving performance of drivers
- Limitations of assisting organizations (e.g. transport companies or railways make traffic interruptions on their trolley lines fundamentally at night)

As a model example, I used the transport of 184 t stator from Pilsen to nuclear power plant Mochovce, which, considering the above-mentioned limits and limitations, was planned as

follows, see the schedule. Total parameters of the transport kit were (length x width x height) (47.5 x 4.4 x 5.3) m and weight 293.7 t.

Figure 24 – Transport of stator from Pilsen to Mochovce

The total route of 745 km was completed in 6 days, i.e. 144 hours, then the average speed is 5.17 km/hour, which is comparable to water transport. With the transport of the stator, however, we did not have to deal with weekend traffic limitations, etc., waiting for follow-up Police and technical escorts in individual countries, there were no assistants of power engineers, transport companies, etc., because transport was not extreme in height. In such cases, the average speed decreases even more, and it is therefore far more interesting to think about river transport. By way of illustration, the port of Opole on the Odra in the FAMET area is prepared for maximum cargo dimensions for river transport (45 x 7.5 x 6.5) m and a cargo with a weight of 476 t was actually transported through this port.

Figure 25 – Inland port in Opole

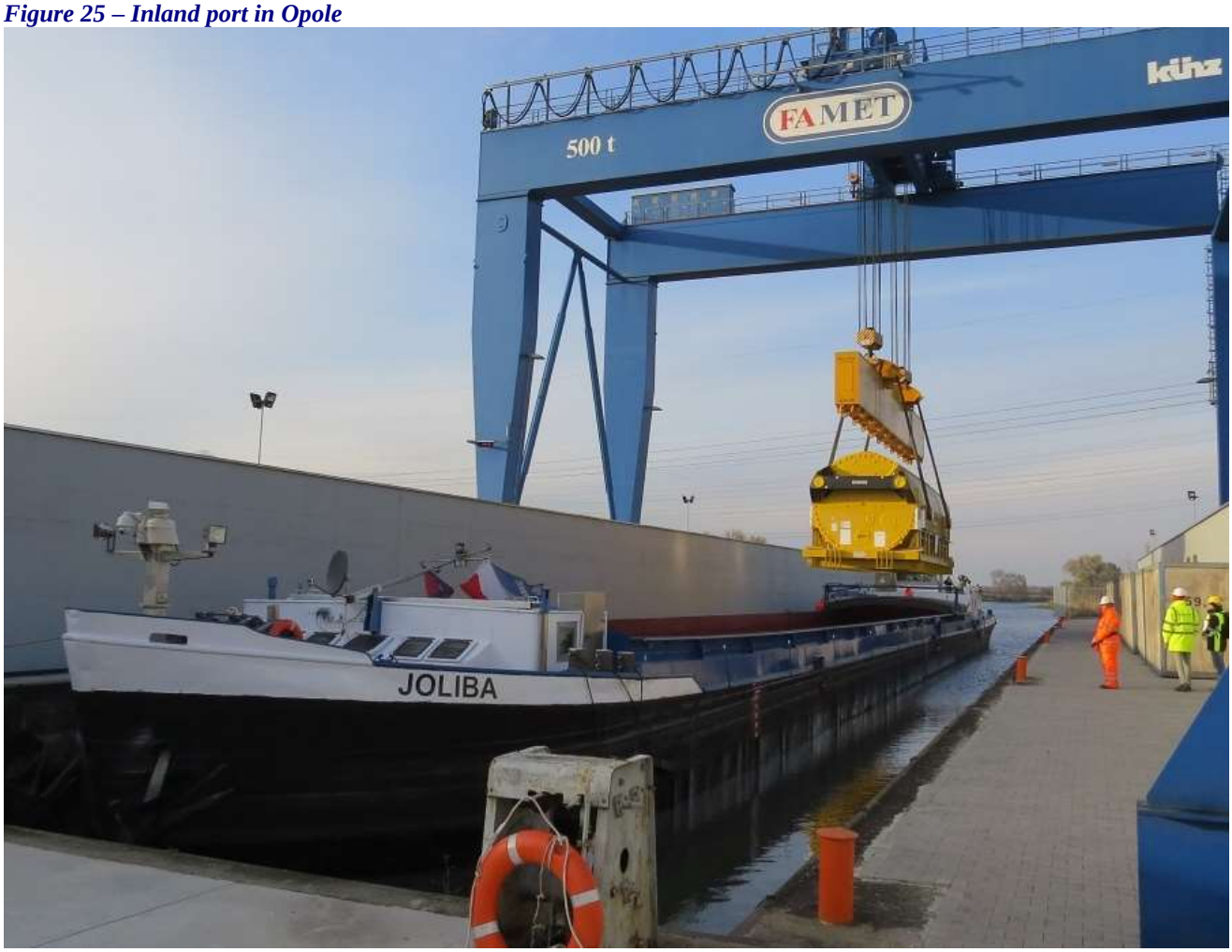


Table 34 – schedule of oversize transport from Plzeň to Mochovce

Den	Čas		Km		
	Plán	Skut.	Jedn.	Celkem	Místo - silnice
10.06.2018	23:00		0	0	Plzeň,Doudlevce - ŠKODA a.s.
Neděle			0,1	0,1	E.Beneše
			0,9	1	17.listopadu
					Sukova
			0,5	1,5	Nová Folmavská
			1	2,5	vpravo Domažlická I/26
	23:40		4	6,5	vlevo Vejprnická
			0,5	7	vpravo Křimická II/605
			3,5	3,5	Kozolupy vpravo II/180
	23:55		1	4,5	Město Touškov
			5	9,5	Nová Hospoda vlevo I/20
11.06.2018			10,5	20	Uněšov
Pondělí			15,5	35,5	Bezvěrov
	1:00		8,5	44	Toužim sjezdem na MK. ul.Plzeňská
					Toužim
	1:30		7,5	51,5	Kozlov vlevo III/19814
					Mirotice
	5:15		4,5	56	Číhaná
			3	59	Něm. Chloupek vpravo II/208
	6:00		7,5		Bochov vpravo I/6
	6:30 - 7:00		0,5	67,5	Bochov
11.06.2018	20:00:00		0	67,5	Bochov
Pondělí			13	80,5	Bošov D6
	20:30		3	83,5	Libkovice I/6
	21:25		17,5	101	Bukov
	22:15		25	126	Řevničov
	23:00		18	144	Slaný (městem)
			4	148	Slaný výjezdem na I/16
12.06.2018	0:15		23	171	Nová Ves
Úterý					Spomyšl přes obec
			14	185	Mělník vpravo I/9
	1:20		6	191	Kly II/331
			19	210	Stará Boleslav II/610
	2:20		2	212	Brandýs n.Labem II/245
			7,5	220	Čelákovice vpravo sil.III/tř.
			3	223	vlevo II/611
	3:10		5	228	Mochov
			15	243	Sadská
	4:00 - 5:00		9,5	253	křiž. poděbrady Jih
	6:00 - 6:30		12,5	265	Kolín městem sjezd protisměrem
12.06.2018	20:00		0	265	Kolín odjezd
Úterý			9	274	Malín protisměrem výjezdem na I/2
	21:15		23	297	Přelouč
	22:00		11,5	308,5	st.Čivice vpravo sil.III/tř.
			7	315	Nový dvůr vlevo I/17
			3,5	318,5	Bylany vpravo na sil.III/tř.
	23:15		5,5	324	Chrudim I/17
13.06.2018	0:20		27	351	Zámrsk
Středa	1:15		17	368	Litomyšl
			15	383	Svitavy mimo
	2:30		16	399	Mor.Třebová
	3:15		19	418	Mohelnice sjezdem na R35
					Křepelka
			13	431	Olomouc výjezdem na obchvat R35
	4:30		13	444	Olomouc výjezdem 276 na I/55 -
			9	453	Přáslavice II/437
	5:15 - 6:00		7	460	Staměřice
13.06.2018	20:00		0	460	Staměřice
Středa			18	471	Lipník nad Bečvou vpravo I/47
	21:10:00		16	487	Přerov
			4	491	Přerov výjezdem na Hor.Moštěnice
	21:40		9,5	500,5	Břest vpravo sil.III/4327
					Skaštice
			6	506,5	Křiž. 260 sjezdem na D1
			2	508,5	Exit 258 sjezdem na II/367
	22:00		2	510,5	Kroměříž
			10,5	521	Zdounky
14.06.2018	0:20		12,5	533,5	Střílky vlevo I/50
Čtvrtek			15	548,5	Tupesy vlevo sil.III/05018
	1:20		1	549,5	Zlechov
			5	555	Velehrad vpravo II/428
			4	559	Uh.Hradiště vpravo I/55,vlevo II/427,sjezdem
	2:20		2	561	Kunovice
	3:10		12	573	Veselí nad Moravou
			8	581	Strážnice
			5,5	586,5	Petrov
	4:00 - 5:00		3	589,5	Sudoměřice st.hranice
14.06.2018	18:30		0	0	Sudoměřice st.hranice. II/426
Čtvrtek	19:00		9,5	9,5	Holíč vlevo I/51
	20:00		26	35,5	Senica
			10	45,5	Jablonica
	21:30		11	56,5	Trstín vlevo II/502
					Horná Kruppá
					Dolná Kruppá
					Trnava vlevo na JVO
	22:30		18	74,5	Trnava
14.06.2018	23:00		0	74,5	Trnava
Čtvrtek	23:30				Trnava výjezdem na R1
15.06.2018	0:15			92	Sereď
Pátek			24	100,5	sjezdem na I32 a zpět na R1
	0:40		13		Nitra sjezdem na R51 do města
	1:15		12	125	Nitra R1,Chrenovská,Levická, výjezdem na I/
	1:45		16	141	Vráble
	2:20		8	149	Čifáre
	3:00 - 3:30		6	155	Mochovce odstavení na křiž. před JE
15.06.2018	8:00 - 20:00h				Mochovce úprava traileru a vjezd do JE

7.4.2. Poland

The use of a network of inland waterways for transporting loads is very important, especially considering the optimization of transport costs, reducing the negative impact on the environment and meeting EU requirements in the transport of goods, as well as the location of Poland along the Paneuropean Transport Corridors. Among the transported cargo transported by inland navigation there is mainly iron ore, transported between Szczecin - Wrocław, Świnoujście - Wrocław (or Upper Silesia). Often, waterways in Poland are used to transport oversized cargo, eg yacht hulls, industrial structures, reactors, generators, etc. Potential transport possibilities in the scope of oversize cargo relate to domestic transport, but also transport from Poland to Western Europe and Southern Europe (E -30, planned ODL channel), it is also possible to transport oversized cargo by the international waterway MDW E-70 from west to east of Europe. Abnormal loads from Opole or Szczecin are transported to such ports as: Hamburg, Lubeck, Frankfurt / Main, Duisburg, Dusseldorf, Antwerp, Rotterdam, Amsterdam, Metz and others. Figure below shows the unloading of chimney liners imported from Belgium.

Figure 26 – Unloading of chimney linners

Fig. 1. Unloading of chimney liners, Source: [Fot. Damian Bednarz].

The size of potential cargoes transported using inland waterway transport is presented in Table 1.

Table 35 – Potential dimensions of loads depending on the means of transport

Ship type	Potential dimensions of loads		
	Length and width of the load	Weight	Height

Pontoon sets	lenght 66m - width 8,5m (up to 9m on special arrangements); • lenght 69m - width 8m; • lenght 77m - width 7m.	• 350 t	• Up to 4,5 m (in Poland, on Szczecin – Opole route); • Up to 3,8 m (transport from Poland to inland river ports in West Europe)).
Pusched barges	• maximumlenght of loadis 49m; • maximumwidthof loadís 6,8m.	• 400 t	• Maximum height of loadfor inland Odra watertransport is 5,8m; • Maximum height for trasport from Poland to West Europe is 5m.

Source: own study based on: Jóźwiak Z. Problems of transporting oversize cargo in inland navigation. Logistics, 6/2001, pp. 4733.

An additional advantage of this transport is the fact that it does not require special special permits or the need to notify state administration authorities. It is only required to have a carrier who performs the carriage of cargo with ships of more than 200 tonnes, certificate of professional capacity (issued by the director of the inland waterway) and submission of relevant registration information (data in the form: mass of cargo, its type and place of loading and unloading, traveled, type of ship and country of registration) after completed transport, by the ship's manager.

Table 2 presents a comparison according to selected criteria - the transport branch road, rail and inland waterways within which cargo is transported oversized in Poland.

Table 36 – Comparison of transport of oversized cargo using various modes of transport

Lp.	Criterion	Road transport	Railway transport	Inland river 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

Problem of determination or assessment of routes for the transport of excessive and oversized costs (Government Regulation No. 349/2009 Zz) is part of the special use of the road network within the meaning of § 8 of Act no. 135/1961 Coll. on road communications (Road Act), as amended. In technical regulation TP 103 Authorization procedure for the special use of roads for the transport of excessive and oversized costs (and some related imposed obligations of infrastructure managers and other entities) there is a methodological instruction for the authorization procedure for the special use of roads for the transport of excessive and oversized costs. The actual speed of transport of excessive and oversized costs in road transport depends on various factors such as:

- load capacity of the road and bridges,
- dismantling of power lines (power lines);
- adjusting the transport profile,
- road traffic density (time constraint), etc.

In rail transport, the transport of excessive and oversized goods is mainly influenced by rail track ratios (track table), cross section, track load category, axle load on the vehicle.
Due to the defined area, it is not possible to use the water transport route due to the fact that the waterways and the water transport facilities are not located in the territory of the Žilina Region. The following table shows the average speeds of each mode of transport.

Table 37 – Average transport speed, SR

Type of transport	Actual average speed
Road	60 km/hod
Railway	20 – 30 km/hod (50 km/hod on main corridors)
Water	7-8 km/hod
Road oversize	5-6 km/hod

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

7.5. Increasing of safety

7.5.1. Czech republic

In 2017, road accidents in the Czech Republic were the result of accidents:
- 502 killed
- 2,339 severely injured
- 24,740 slightly wounded
- 103,821 traffic accidents in total

At the average damage per accident of CZK 61,000, the total damage is CZK 6.316 billion, net of the external costs of the claims.
In rail transport, the number of accidents for the year 100 does not exceed the long-term, the similar situation is in the water transport.
Compared with overall performance, road traffic incidence is 10x to 100x higher per unit of transport than in water or rail. This is the result of the several-fold increase in the price of road accidents caused by accidents.

7.5.2. Poland

Road transport is dominated by accidents of passenger transport, while freight transport accounts for 7,7% of all road transport accidents in the province Śląski and in the province Opolski 7%.
This factor has a significant impact on the development of transport, including the use of intermodal transport due to negligible accidents in other branches of transport (the transfer of freight to other branches). Taking into account the reports and historical data of the Central Statistical Office, a decrease in total road transport accidents is forecast (including passenger and freight transport). Analyzing the current tendencies of accidents in road transport, it can be concluded that Poland falls very unfavorably compared to other EU countries. The average in the EU is 60 in Poland in 2011 - 110 deaths per million

inhabitants, in 2016 - 79 fatalities per million inhabitants in Poland and 50 in the EU. In 2017, however, the number of deaths in the EU is 2%, while in the EU - 2%. in Poland, increased by 2%).

Table 38 – The table shows the number of accidents in freight transport within one year divided into branches of transport.

Cost category	Road transport		Railway transport	Inlad waterway transport	Sea transport
	Vans	Trucks			
Accidents	145,87	26,47	0,52	0	0

7.5.3. Slovakia

Road safety and road accidents and road accidents, which represent an important indicator of the level of road conditions (construction and technical condition) and traffic (traffic-organizational) conditions, influence the level of transport performance of the company. Therefore, it is an important criterion in the planning, construction, renewal and maintenance of the road network. Motorized and automotive road transport has an ever increasing tendency. Besides unquestionable advantages, they also bring with them a great increase in the load on the road network and increasingly demanding transport requirements and safety. The following table shows the number of traffic accidents (DN) from critical accidents on roads I and II. of the ŽSK class for 2017.

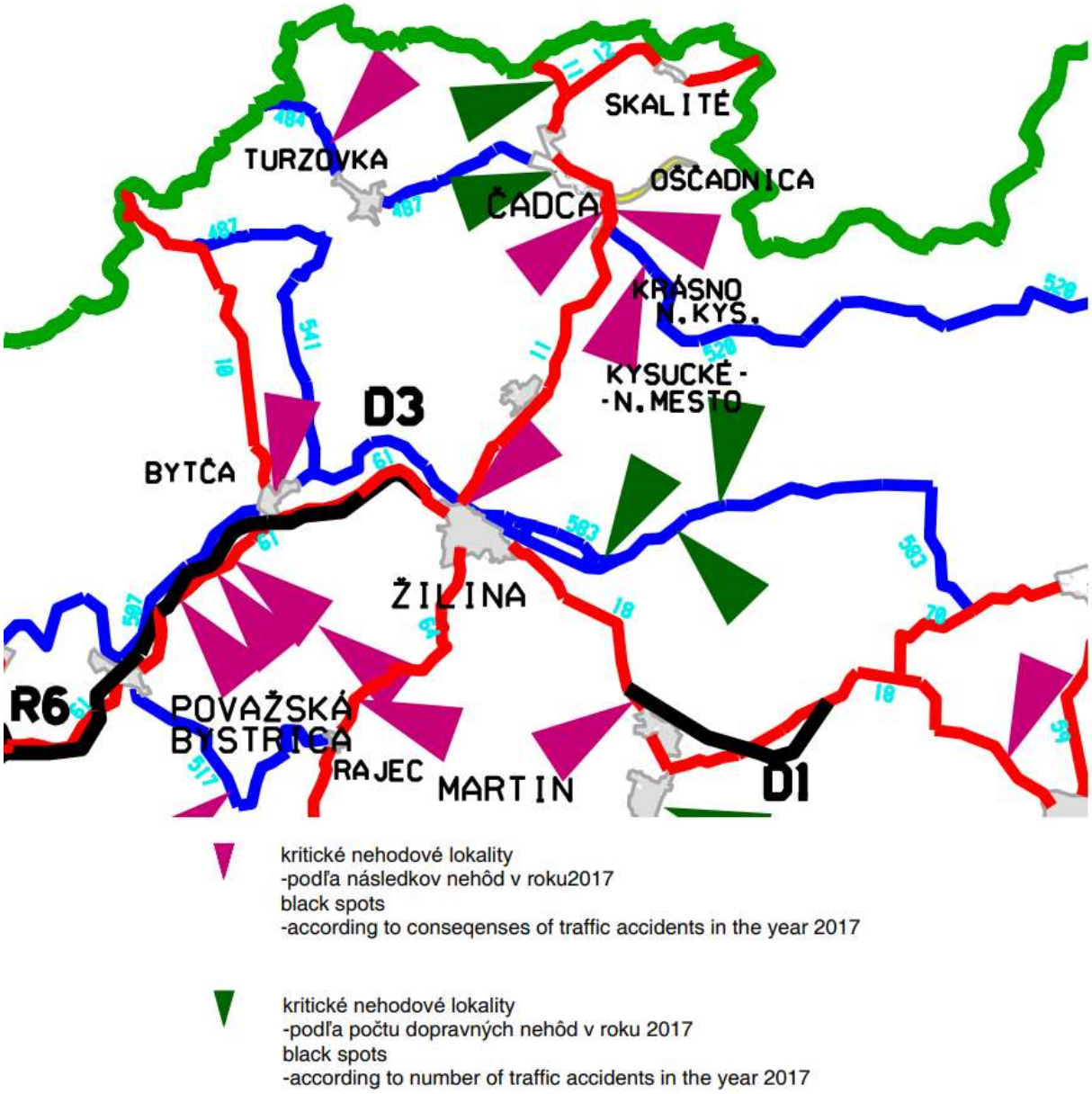
Table 39 – Critical accidents on the roads I.II. of the ŽSK class according to the number of traffic accidents in 2017, SR

Maintenance district	Road No	Number of accidents
Žilina	583	21
Čadca	11	18
	487	9
Martin	85	6

Source:http://www.ssc.sk/files/documents/becep/kriticke-lokality/knl_tabulky/2017/knl_cesty_hn_2017.pdf

The long - standing recurrent critical accident site is located in the wider area of the unplanned intersection of roads I / 18 and I / 11 in Zilina, crossing the main roads of the multimodal European corridors Baltic - Adriatic, Rhine - Danube in Slovakia. This accident site also has a long-standing presence in the first places of evaluation throughout the Slovak Republic. The unfavorable traffic-safety situation of the ŽSK territory is related to the high traffic intensity on the main roads of the transport corridor, which do not correspond to their building-technical condition with the requirements of the current transport, the delays in the construction of the necessary capacitive communication - the highway and also the overall development of traffic safety aspects in society.

Figure 27 –Density of accidents on I. and II. class roads at Žilinský region



Source: http://www.ssc.sk/files/documents/becep/kriticke-**lokality/knl_tabulky/2017/knl_2017.pdf)**

One of the critical accidents on the I / 11 road is located in the village of Kysucký Lieskovec, where the accidental section is led in a slight left-handed arc. According to the national census in 2015, the traffic intensity in the section was 14186 cars / 24h (25% freight). the cause of traffic accidents was a frequent indicator of inappropriate speed, wrong way of avoiding, center with pedestrian. Within the critical accident site and because of the existence of stops and increased movement of the population, a maximum speed of 70 km / h was set. Another accidental location is located in the municipality of Povina, where the accident section is led directly. The frequent cause of traffic accidents in this segment was inappropriate speed, incorrect vehicle prevention, and wildlife. One of the proposals to

prevent traffic accidents in this section is the construction of the D3 motorway Kysucké Nové Mesto - Oščadnica.
Critical accident site on the I / 12 road is located in the village of Skalité, where the accidental section is in the place of the double directional arc of the national road I / 12. The causes of traffic accidents on this section are often times disproportionate. One of the proposed measures to prevent collisions on the road is to put into operation the section of the Svrčinovec - Skalité št. hr. SR / PR and the resulting reduction in road traffic intensity on the firstclass road. The following table lists the traffic accidents and the consequences of accidents for 2017.
Another critical accident site is located in the outskirts of Makov, where the stretch begins with a slight left-hand twist, followed by a straight section. This section is guided in the upward direction. According to the national census in 2015, the average daily traffic intensity was 4 978 vou./24 h. of which 24% are heavy vehicles. The start and end of a critical accident site is 0.5 km beyond the intersection to the local part of Kolárovice where the traffic intensity is not high. According to the national census in 2015, 30.94% of the freight transport intensity is in this segment.

Table 40 – Traffic accidents and consequences for the year 2017 compared with the year2016, Slovakia

Charakteristic	Period	ZSK	Overall	%
Traffic accidents	2017	2164	14013	15,44%
	2016	2009	13522	14,86%
Traffic accidents with consequence of life and health	2017	741	5317	13,94%
	2016	767	5264	14,57%
Killed	2017	35	250	14,00%
	2016	40	242	16,53%
Heavily injured	2017	187	1127	16,59%
	2016	175	1057	16,56%
Easy injured	2017	762	5757	13,24%
	2016	837	5884	14,23%

Source: Prezídium policajného zboru, vyhodnotenie dopravno –bezpečnostnej situácie za rok 2017
Nehodovosť ŽSR

Table 41 – Traffic accidents on ZSR network, Slovakia

Accident type	2017 awerall/ŽSR	2016 awerall/ŽSR	Difference awerall/ŽSR
Train crash	14/2	13/1	+1/+1
Derailment oft he train	2/2	5/4	-3/-2
Accidents on crossings	50/0	38/0	+12/0
Fire in a rolling stock	10/0	7/0	+3/0
Injury of person caused by rolling stock movement	120/0	108/0	+12/0
Accidents when railway vehicles are shuntting	36/13	31/12,3	+5/+0,7

Source: Výročná správa ŽSR,2017

7.6. Building of waterway

The building of the waterway is a trivial condition, however basic. The basic description is in Chapter 4.

7.6.1. Czech republic

The timetable of waterway building is not yet binding. Approval of the D-O-L study is in progress. The most potential has section PL/CZ – Ostrava in Czech part of TRITIA area. All proposals are along Odra river in this terirory. Other proposals – connection to Mital factory or section along Olše river – are not realistic planned.

7.6.2. Poland

Assumptions
The deployment of the Odra Waterway (ODW) is one of the assumptions of the current government's policy. Pursuant to the resolution of June 14, 2016 (Journal of Laws of July 22, 2016), the achievement of an international navigability class and inclusion in the European network of water routes ODW (E-30) is the first priority indicated in the document: "Assumptions for development plans of inland waterways in Poland for the years 2016-2020 with a perspective until 2030. "Within the mentioned priority, the following were indicated:
• I.1. Elimination of current bottlenecks.
• I.2. Adaptation of the Odra Waterway to Va class parameters.
• I.3. Construction on the territory of Poland of the missing link Danube - Oder - Elbe.
• I.4. Construction of the Silesian Canal.

Figure 28 – Priority I: Odra Waterway

Source: Assumptions for development plans for inland waterways in Poland for 2016-2020 with a view to 2030, 2016, p. 7

As part of the document "Assumptions for plans for the development of inland waterways in Poland for the years 2016-2020 with the persect until 2030", a detailed scope of investment tasks at the oder waterway was indicated:

In the short term:
1. On the Upper Oder:
a. completing the construction of the Racibórz reservoir;
b. agreeing with the Czech side the schedule for the construction of the Odra-Danube Canal and carrying out planning and design activities.
2. On the Gliwice Canal, completion of renovation and modernization works on locks within the existing waterway class and commencement of design and modernization works of the channel's positions up to class V;
3. On the Oder sewer section, commencement of reconstruction of existing locks to Va class parameters along with modernization of the locks' avanports.
4. On the central Odra flowing freely to the estuary of Nysa Łużycka:
a. completing the construction of the Malczyce barrage,
b. commencement of the construction of subsequent water stages Lubiąż and Ścinawa, with simultaneous modernization of the regulatory construction at the positions of both these locks,
c. planning and possible commencement of the selective sewerage stage of the Oder flowing freely below the Ścinawa barrage according to the agreed order and linking the adopted construction schedule with regulatory works on the remaining sections along with the modernization of buildings for individual positions of new locks and reconstruction of arches with radii smaller than 650 m,
d. carrying out repairs and modernizations of regulatory construction in the most limiting places.
5. On the border section:
a. start talks in the field of the Oder border,
b. comence and carry out modernization and repair activities of the existing regulatory construction, in accordance with the concept established with the German party;
c. implement harmonized river information services (RIS) on the border section of the Oder.
6. In the area of the Szczecin water junction, rebuild the drawbridge over the Regalica River at km 733,7.

In the long-term perspective:
1. On the upper Oder, finish the construction of the Odra-Danube connection.
2. On the Gliwice Canal, implement a phased reconstruction of the channel's positions up to class V, along with the construction of new locks next to existing ones
3. On the canalization section of the Odra river, complete the reconstruction of the other locks and reconstruct the riverbed.
4. On the Middle Oder, flowing freely to the mouth of the Nysa Łużycka River, complete the construction of the cascade of locks along with adapting the geometry of the channel to the requirements of class Va.
5. On the Odra River, depending on the results of negotiations with the German side:
a. start the sewage system in accordance with the established concept and schedule, adapting to work on the national section through the selective development of the border

section in order to gradually improve the navigation conditions,
b. carry out further modernization works on the regulatory structure, supported by dredging below the last water level in the direction of Szczecin (together with the Dąbie lake).
6. Rebuild the bridges, adjusting their shipping bays to the waterway class Va requirements.

In accordance with the development strategy of inland waterways, developed by MGMiŻŚ and adopted by the government, expenditures of PLN 2.9 billion will be planned for the Odra Waterway (ODW) until 2020, and by 2030 - a total of approximately PLN 30.7 billion .
In addition, PLN 11 billion would cost the construction of the Silesian channel that would connect Odra with the Vistula, PLN 3.1 billion - adaptation of the Gliwice channel, PLN 2.9 billion - modernization of 20 water degrees, PLN 6.6 billion - construction of 14 new water stages on the section Brzeg Dolny - outlet of Nysa Łużycka and PLN 4.5 billion construction of eight waterways on the so-called Measles from the borderline. As part of the ODW in 2021-30, the construction of the Koźle-Ostrawa canal is planned, which would be the Polish part of the waterway to the Danube.

Current activities - ODW
Currently, the Ministry of Maritime Economy and Inland Navigation are working on the preparation of the "ODW Development Program". The partner in this task is the Port of Szczecin and Swinoujscie SA. According to the Ministry of Maritime Economy and Inland Navigation (MGMiŻŚ), from 8.11 to 9.12.2018, a public consultation on the work schedule for the preparation of the ODW Development Program is carried out. It assumes that:
• the completion of the work schedule will be completed by the end of 2018 and a transport analysis will be developed;
• by the end of the first half of 2019, arrangements will be made with the General Director of Environmental Protection and the Chief Sanitary Inspector regarding the scope and level of detail of information required in the environmental impact forecast for the Development Program of the ODW;
• economic and technical analyzes will be completed in the first quarter of 2020;
• in the second quarter of 2020, the development of the draft ODW Development Program is assumed; in addition, project environmental impact forecasts will be completed;
• by the end of 2020, a public consultation of the Program project is planned along with an environmental impact forecast;
• the final version of the Odra Waterway Development Program along with the environmental impact forecast is to be ready in the first quarter of 2021.
On 05/04/2018, a document on modeling of shipping on ODW was presented in Szczecin. It contains final decisions regarding, among others location and number of water degrees on the Oder. In total, 29 new water levels will appear:
• on the section from the emerging Malczyce barrage to the mouth of the Nysa Łużycka river, the following damming locations were indicated: Lubiąż, Ścinawa, Rajczyn, Chełm, Orsk, Wietszyce, Wilków, Głogów, Żukowice, Bytom Odrzański, Nowa Sól, Młynkowo, Klenica, Głęboka, Krępa, Pomorsko , Będów, Chyże, Osiecznica, Krzesiny;
• at the border section of the ODW, the following locations were indicated: Tawęcin, Urad, Świecko, Lubusz, Owczary, Kostrzyn nad Odrą, Kaleńsko, Gozdowice, and Bielinek;
In addition to the quantity and location of water stages, no estimate of the investment or construction dates was given. They are to be included in the ODW modernization program.

Current activities - Silesian Channel
The construction of the Silesian Canal is part of the "Guidelines for plans for the development of inland waterways in Poland for 2016-2020 adopted by the Council of Ministers on 14/06/2016 with a view until 2030". At the moment, however, there are no concrete arrangements related to the concept. The form of implementation, sources of financing or the course of the channel have not been established.

Current activities - Gliwicki Channel
• In 2016, the project titled "Modernization of the Odra locks on the section managed by the RZGW Gliwice - adaptation to the III class of the waterway - Phase I". Within its framework, the locks of the Gliwice Canal in Rudzińcu and Kłodnica were modernized. A significant part of modernization works was carried out at the locks Dzierżno and Łabędy.
• In 2016, the project titled "Modernization of the Odra locks on the section managed by the RZGW Gliwice - adaptation to the third class of the waterway - Phase II". As part of it, modernization works are carried out on the Łabędy and Dzierżno locks. The project end date is scheduled for the end of 2018.
• Currently as part of the next project "Modernization of the Odra locks on the Gliwicki Canal, on the section on the RZGW Gliwice board - adaptation to the 3rd class of the waterway - stage II", modernization works of the sluice Nowa Wieś and Sławęcice are being carried out. At the moment almost 1/4 of works have been carried out. The end of the project is scheduled for 2021.

7.6.3. Slovakia

Waterways and water transport facilities are not located in the territory of the Žilina Region. In the long term, we are considering the construction of the Vah inland waterway, where the preparation includes the planned Zilina port, where is planned terminantion of the Váh waterway. The original purpose of the construction of the navigable water canal through Kysuce, linking the Odra River in the territory of the Czech Republic. In last strategic documents to the development of inland waterways in the Slovakia are not defined the connection from the Žilina to the Czech republic. In the current version there is planned modernization of Váh inland waterway from the Danube to the Žilina (250 km). The modernization of the Váh inland waterway is planned but without defined time schedule of the projects at the moment. From this reason we are not considering with Váh inland waterway within time horizont to 2030.

7.7. Creating and increasing of transhipment sites capacity

7.7.1. Czech republic

The "D-O-L" study specifies in the Czech part of the TRITIA region two ports for cargo ships, namely Ostrava and Mošnov. It is assumed that both will be able to transfer all kinds of cargo. The potential of the port and the transfer point in Mošnov is the proximity of the industrial zones in Mošnov and Kopřivnice, the port and the transfer point in Ostrava will serve all other regional locations due to its favorable location in Mariánské Hory near the junction with the D1 and the railway corridor. The direction of the flow of goods in the direction from the Žilina Region to the North is also envisaged in Ostrava, where a different

mode of transport will be used in the Žilina - Ostrava section.
Due to the absence of a waterway and therefore also of cargo ships, the capacity of existing installations is not assessed.

7.7.2. Poland

At present, 37 terminals using railway transport operate in Poland. Among them, 6 objects are also classified as sea terminals, and four of them additionally provide inland waterway service (BCT Baltic Container Terminal Ltd., Deepwater Container Terminal Gdańsk, DB Port Szczecin Sp.zo.o., OT Port Świnoujście Container Terminal). Their largest number is located in the following provinces: łódzkie (6), wielkopolskie (5), śląskie (4), and pomorskie (4). Most of the objects are located in the vicinity of large and important urban agglomerations; in addition, they fit well into the corridors of the TEN-T transport network. A definitely smaller number of terminals is located in the border areas and in this aspect, especially in some areas, it can be concluded that there are deficiencies (number of terminals using rail transport: West Pomeranian Voivodeship - 2 terminals; Lubuskie - 1 terminal, Lower Silesia - 3 terminals, Opole - 0 terminals, śląskie - 4 terminals).
A non-significant phenomenon in the context of recent years is the systematic development and increase in the number of intermodal terminals. It is expected that this trend will continue to be maintained. The two potential above-mentioned marine container terminals located in Gdynia and Gdańsk have the greatest potential. They have the highest functional parameters in terms of total area, storage area, maximum annual handling capacity. They also have the largest share in the maximum annual transhipment capacity in relation to all operating terminals. The remaining ones are characterized by smaller parameters in this range.
In the Odra Waterway text, it is important to consider railway terminals located in the long distance (and at a relatively short distance) from the Odrzańska Droga Wodna:

- DB Port Szczecin
- OT Port Świnoujście Container Terminal
- Rail Terminal Rzepin Sp. z o.o.
- PCC Brzeg Dolny Terminal
- Schavemaker Kąty Wrocławskie
- Siechnice Container Terminal
- PCC Gliwice terminal
- Gliwice Container Terminal
- Polzug Terminal Dąbrowa Górnicza
- Euroterminal Sławków
- SZIEIEŃKA Container Terminal

Table 42 – The main information about the terminals showing their potential is presented in the table

Terminal	Vojvodeship	Awerall area [ha]	Stock capacity [TEU]	Displacement capacities [TEU]	Technology	Distance from main road	Distance from railway	Permanent international link	Number of railway sidings
DB Port Szczecin (Container terminal, terminal for pieces goods)	Zachodnio-pomorskie	12,7 (whole area DB Port Szczecin 56,6)	4000	120 000	Containers	1km (DK10)	1km	Yes	2
OT Port Świnoujście Container terminal (terminal containers,	Zachodnio-pomorskie	20	2000	70 000	Containers	100 m do S3, 60km do A6			1

meat pieces, agriculture products)									
Rail Terminal Rzepin Sp. z o.o.	Lubuskie	1,6	40000	500	Containers, swap bodies, semi-trailers	5,5km do A2 i DK92	In the dirrect niegbourhood	Yes	1
Terminal PCC Brzeg Dolny	Dolnośląskie	9	11000.	2464	Containers, swap bodies, semi-trailers	40 km do E67, 60 km do A4	Directly on line 237, 30 km to E30, 30 km to C-E59	Frankfurt upper Odra	1
Schavemaker Kąty Wrocławskie	Dolnośląskie	5	75000	2700	Containers, swap bodies, semi-trailers	1,5km A4	0,01km do linii 274	Regular and spot connections	1
Container terminal Siechnice	Dolnośląskie	10	50000	800	Containers	25km do A$	Linia 277	Yes	1
Terminal PCC Gliwice (na terenie ŚCL SA)	Śląskie	5	150000	2900	Containers, swap bodies, semi-trailers	10km do A4 i A1	Directly on line E30/C-E30, 15 km do linii E65/C-E65	Yes	Siding ŚCL SA
Container terminal Gliwice	Śląskie	6,5	128000	1800	Containers, swap bodies, semi-trailers	2 km do A1; 7 km do A4; 1,7 km do DK88	Directly on lineE30, E59	Yes	1
Polzug Terminal Dąbrowa Górnicza	Śląskie	16	233600	1400	Containers, swap bodies, semi-trailers	3km DK94	3km to line 154	Yes	1
Euroterminal Sławków	Śląskie	91	284810	3500	Containers, swap bodies, semi-trailers	4 km do DK1/S1 10 km do DK4/A4 4km do S94	5,7km to line 665; 2,2km Sławków LHS (line674)	Yes	Normal and wide track gauge
Container terminal Włosienica	Małopolskie	10	50000	780	Containers	44km do Katowic, 55km do Krakowa		Yes	1

Source: Based on UTK (November 2018)

Of the aforementioned terminals, particular attention should be paid to:
• two terminals (Szczecin and Świnoujście) - due to their potential related to the service of inland navigation;
• Eutoterminal Sławków - due to its significant potential related to access to a wide track, which is particularly important due to the development of trade with the countries of Eastern Europe and Asia;
• PCC Intermodal Gliwice - due to its significant potential related to operations within the Śląski Centrum Logistyczny SA; in addition, it should be particularly emphasized that the Port of Gliwice operates as part of ŚCL, of which ŚCL is the governor; the possibility of providing comprehensive logistic service;
A positive aspect of operating transhipment terminals is the observed constant development in the range of services offered, commissioning connections and reloading devices. The connection of terminals with road and rail infrastructure is also significantly improved. The problems are: still poor condition of the railway infrastructure, failure to meet some of the AGTC contract guidelines regarding the required length of loading and unloading tracks, lack of modern reloading systems, very low share of trans-shipment of swap bodies and semitrailers.
In addition to the previously discussed rail terminals, it is necessary to indicate additionally river ports, which can act as transhipment terminals between inland navigation and other

modes of transport. Two important terminals operating within the ports have already been mentioned before (Szczecin and Świnoujście). Unfortunately, the disadvantageous phenomenon in Polish inland navigation is the systematically decreasing number of ports. This is related to the marginal use of inland waterway transport for cargo. Odrzańskie ports and reloading facilities are mostly obsolete, a significant part of them was built at the beginning of the last century. Lack of proper repairs caused that many buildings are depreciated and devastated. The situation is similar with the condition of reloading devices, many of which are outdated and characterized by low efficiency. Most of the river ports are characterized by low transhipment potential, which is adapted mainly for handling bulk cargo, although the equipment of some of them does not exclude handling of general cargo and large-size cargo, including containers.
In accordance with the AGN Convention, within the Odra Waterway, inland ports of international importance are distinguished (marked in red in the figure below):
• Świnoujście (Baltic Sea-Ujście Odry)
• Szczecin (Odra, 741km)
• Kostrzyn (Odra, 617km)
• Wrocław (Oder, 255 km)
• Koźle (Odra, 96km)
• Gliwice (Gliwicki channel, 96km)

Figure 29 – Roads and river ports in Poland (ODW)

Source: Transport Development Strategy until 2020 (with a prospect until 2030), Ministry of Transport, Construction and Maritime Economy, Warsaw 2013, p. 15

Table 43 – Characteristics of ports

Designation (in accordance with AGN)	Ports	Cargo handling capacity			Cargo handling equipment available for			
		0,5-3,0 million tons	3,0-10,0 million tons	>10,0 million tons	Containers 20'	Containers 40'	Ro-ro	Rail access
P 30-01	Świnoujście		x		x	x	x	x
P 30-02	Szczecin			x	x	x	x	x
P 30-03	Kostrzyn	x			-	-	-	x
P 30-04	Wrocław	x			-	-	-	x
P 30-05	Koźle	x			-	-	-	x
P 30-01-01	Gliwice	x			-	-	-	x

Source: Conditions for the development of river ports along the ODW - case study, II local government consultations of the Odra Waterway Development Program, Szczecin, April 2018

At the moment, the largest potential and level of development have ports in Szczecin and Świnoujście. Apart from them, much attention is paid to Port Gliwice, which is the initial port of the Odra Waterway. It is an element of ŚCL SA. In July 2017, after several years of interruption, he began to function. In 2017, 126.9 thousand were transhipped in the Gliwice port. tons of coal dust from the Gliwice Sośnica mine for the Wrocław heat and power plant. From the port to Wrocław from July to the end of the year, as many as 293 barges floated, each with a capacity of 500 tons. In 2018, it is planned to reload about 250 thousand. tons of coal.

In Gliwice Port, works related to the reconstruction of the railway freight station are carried out in order to service longer trains (the station has not been renovated since 1939). The investment is carried out by PKP PLK and is to amount to approximately PLN 32 million, works are in the final phase (planned completion on November 30, 2018). The investment will increase the capacity of the Gliwice port for rail transport (the station will be able to accept trains with a length of 880 m).

Significant development plans also appeared in the Port Koźle, after the purchase of land by the company Kędzierzyn-Koźle Terminale. They are associated with three terminals - Liquid Bulk Products, Bulk Bulk and Container Products. At present, the investment estimated at over PLN 300 million is at an early stage of development, it is also running with big problems - it has now been stopped. The reason for suspending the work is the lack of consent of PKP SA for a 500m section of tracks necessary for the operation of the terminal. In August 2018, the first terminal (liquid bulk goods) was made in 30% and cost PLN 50 million. The plans assumed its launch in the first quarter of 2019, due to complications this deadline was postponed by six months. Regarding the construction of the second (container) terminal at the end of 2017. began efforts to obtain the required environmental

approvals. The date of their issue is also prolonged, which impedes the investment process. Comparing to the last terminal (bulk goods), planning works are under way.

Poland's transport strategy strongly emphasizes the need to develop freight transport, including intermodal transport with the use of railways and the Oder Waterway. Together with the plans for the development of line infrastructure in these modes of transport, much is mentioned about the development of point infrastructure (railway terminals, river ports). In the case of railway terminals, positive changes have been visible for several years; their further systematic development and modernization is also assumed. River ports are a bigger problem. In their case (and in relation to the Odra Waterway), the works are in the initial, mainly design and conceptual phase.

7.7.3. Slovakia

There are currently 8 active TIPs in Slovakia where, in most cases, IPJ is handled between road and rail or waterborne transport. In the ŽSK area there is a functional terminal of combined transport of international importance, operated by Rail Cargo Operator - ČSKD INTRANS, s.r.o., (The following table describes the basic parameters of TKD). Here is also the newly built TIP (Integrated Transport Terminal) Žilina, for which the tender for the Terminal in Zilina was announced.

Table 44 – Terminal of Combined Transport of International Importance (TKD) in ŽSK, SR

Location	Type	Line AGTC	Capacity [TEU/year]	Operator	Area [m^2]
Žilina	Road - railway	C-E40,C-E63	28 060	Rail Cargo Operator - ČSKD INTRANS, s.r.o., Bratislavská cesta 60, 01001 Žilina	5 961

TIP Žilina is located at the intersection of the AGTC C-E40 and C-E63 lines, and its attractive 80 km radius allows to serve the whole ŽSK and the northern districts of the Trenčín self-governing region. The terminal has the prerequisite to become an entry and connecting terminal for transport from all directions and in the future it can form part of the freight center for the area of northern Slovakia.
According to the study "The combined transport terminal of Žilina", processed by the Research Institute of Transport, a.s. Žilina can be expected that at the time of the expected launch of the TIP, in the first year of operation, the traffic flow to the attractive area could reach about 200,000 tons of goods suitable for intermodal transport and a output of about 300,000 tons (without counting volumes from KIA Motors) . As a result, the need for the region to be transported by intermodal transport of around 500 thousand tons per year. This volume of goods is about 16.5 tons per intermodal cost unit of approximately 30 thousand IJU / year. With the anticipated engagement of KIA MOTORS it is 40,000 IPJ / year. TIP Žilina with its establishment is connected to the Baltic - Adriatic Corridor in the direction of Žilina - Bratislava - Wien and the Rhine - Danube in the direction of Žilina - Košice - UA border. The TIP Zilina parameters are as follows in the following table.

Table 45 – Parameters TIP Žilina, SR

Start re-loading capacity - INJ* per year	40 000
Number of re-loading INJ per day (250 days during the year)	160
Time of one manipulation INJ in minutes	3
Capacity of storage area within range of portal cranes - INJ	1790
Storage area within range of portal cranes – m^2	11500
Awerall length of crane tracks	750
Number of portal cranes - ks	2
Number of useful tracks in the portal crane's reach range – ks	2
Length of unloading / ofloading tracks within range of portal cranes – m	750
Number of layers to stack INJ within range of portal cranes	3
Parking lot of trucks at the entrance to the terminal - number of stations	21
Parking lot of trucks at the exit from the terminal - number of stations	21

Source: http://www.intermodal.sk/terminal-intermodalnej-prepravy-zilina---teplicka/747s

7.8. Removing bottlenecks on routes to transhipment sites

7.8.1. Czech republic

Since the capacity of one ship is 3000 tons or 500 containers, and the capacity of the waterway is 1 ship per hour in each direction, a narrow throat is any place where tens of hundreds of trucks can not be added for the peak hour. The proposed harbors are located near railroad tracks and roads, which can not be evaluated as being insufficiently suitable for the purpose. The issue will be addressed in the next continuation of the project preparation, from the current documentation, the connection of the ports to the road network is not clear.

7.8.2. Poland

Gliwice Port
In December 2018 works on the Gliwice Port railway station were completed. After the reconstruction a new track layout was created, with the possibility of smooth entry and exit from sidings. The station's capacity and the ability to service freight warehouses increased. Now, longer trains can use the station up to 750 m. Providing better service to the Silesian Logistics Center, as well as transport of coal and Odra goods. More cargo from the tracks will be taken over by navigation using the Gliwice Channel and the Oder.

Gliwice is one of the most important railway hubs in the country, lying on the route of the 3rd Pan-European Transport Corridor connecting Germany, Poland and Ukraine.

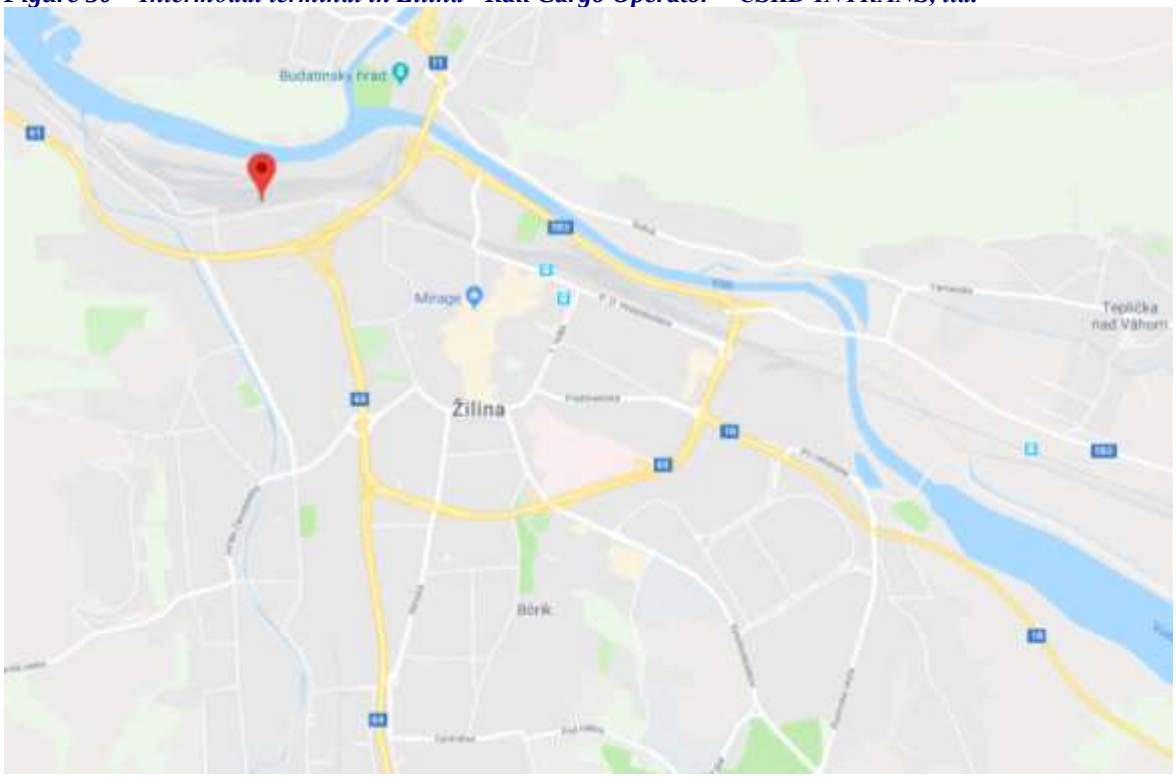
As part of the reconstruction, almost 9 km of new tracks were laid, as well as 16 turnouts with electric heating, which prevents the equipment from freezing in the winter. The renovation covered tracks that connect the Gliwice Port station with the Gliwice - Kędzierzyn Koźle line (line 137). As part of the investment, the traction network was replaced. The station area also gained new lighting.
New computer-operated rail traffic control devices were installed in the reconstructed control room. Changed equipment will greatly facilitate the work of traffic dispatchers. The devices will also increase the level of safety in railway traffic - sums up PLK. The investment for PLN 32 million covered, inter alia, the replacement of almost 9 km of 16 turnouts tracks and the installation of new rail traffic control devices.
Efficient access to the Port of Gliwice is ensured thanks to the extensive road network which includes: A1, A4, DK902, DK88, DK94, DK78.
The Gliwice airport, previously of a sporting nature, will be able to serve business flights or so-called small cargo traffic. Modernization of the facility currently having grassy runways assumes, among others, construction of a 900 m long paved runway, taxiway, apron and container fuel station, as well as construction of car parks and access roads. The investment is to be completed by the end of 2019. According to the city's plans, it is to be an airport from which they will use, among others, associated investors, whose plants are located, for example, in the Gliwice part of the Katowice Special Economic Zone.

Kędzierzyn – Koźle Port
In the port of Kędzierzyn-Koźle, investments were planned covering the purchase of land by Kędzierzyn-Koźle Terminale. The investment is connected with three terminals - Liquid Bulk Products, Bulk and Container Products. At the moment, the investment estimated at over PLN 300 million is at an early stage of development, it also runs with big problems - it has now been stopped. The reason for suspending the work is the lack of consent of PKP SA for a 500m section of tracks necessary for the operation of the terminal. In August 2018, the first terminal (liquid bulk goods) was made in 30% and cost PLN 50 million. The plans assumed its launch in the first quarter of 2019, due to complications this deadline was postponed by six months. Regarding the construction of the second (container) terminal, began efforts to obtain the required environmental approvalsat the end of 2017. The date of their issue is also prolonged, which impedes the investment process. Comparing to the last terminal (bulk goods), planning works are under way.
The access road to the Port of Kędzierzyn - Koźle (investment of 4.1 million) is commissioned, it is a link to Kłodnicka street - it provides free access to the port.

7.8.3. Slovakia

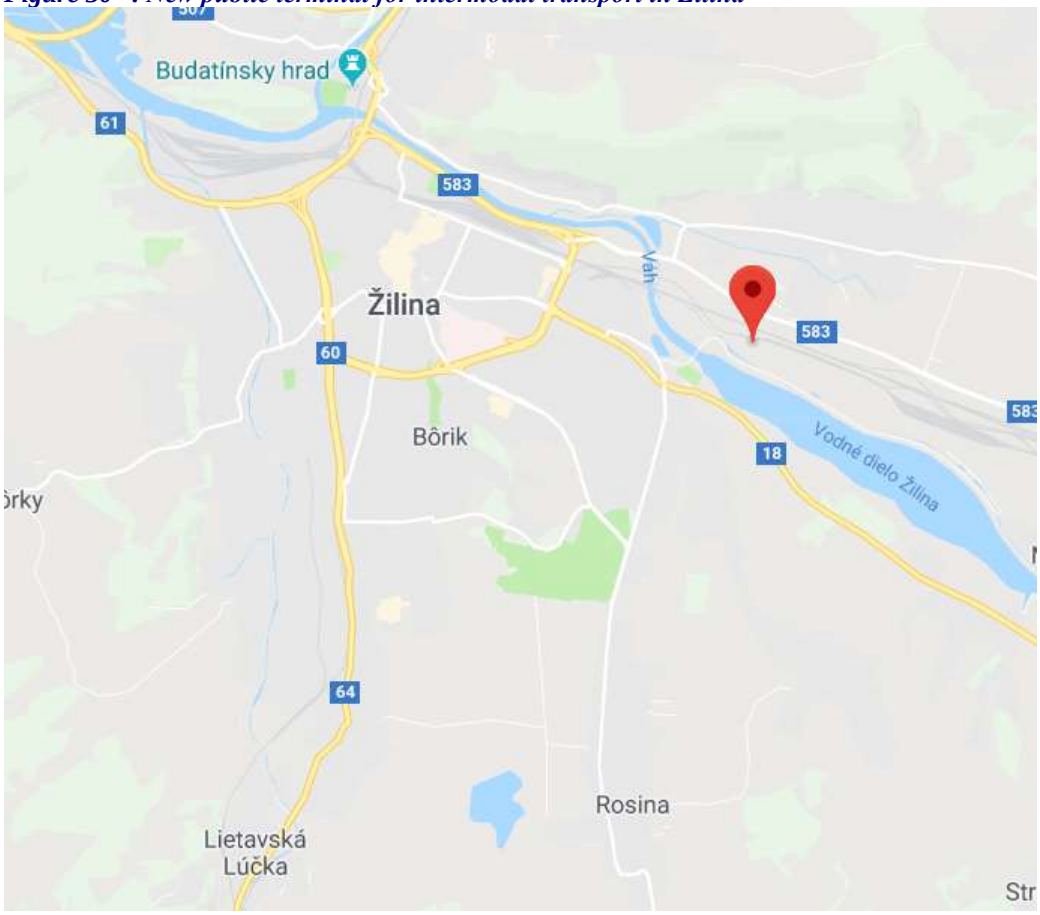
The existing intermodal terminal operated by Rail Cargo Operator – ČSKD INTRANS, ltd. is placed at the north-west part of the Žilina city in the marginal part of the town residential area with connection to the railway and local roads. The place around the terminal is bult-up so there are problems with future development of store capacitie and recontruction of the tracks for longer trains for faster manipulation. The connection to the main road infrastructure (I. class road – I/61, motorway-D3) is through local roads which makes capacities problems on them. The terminal are almost fully engaged at the moment.

Figure 30 – Intermodal terminal in Žilina– Rail Cargo Operator – ČSKD INTRANS, ltd.



In the north-east part of the Žilina city was bult new public terminal for intermodal transport. The start of the operation is planned at the Q2/2019 by the concessionary TIP Žilina owned by the Metrans Danubia. Terminal is located near Žilina water dam and near the Kia Motoros Slovakia, a. s. The terminal is connected on the road II/583 without constraints, but the traffic density at the road II/583 from Žilina to Kia Motors Slovakia, a. s. is very high during peakts, which may cause som problem in the intersection.

Figure 30 –. New public terminal for intermodal transport in Žilina



Trnka

7.9. Key routes and basic nodes specifying

7.9.1. Czech republic

The key routes are the TEN-T corridors and the connectors to the transhipment terminals. From the point of view of water transport, it will be essential to determine the ports in the D-O-L study, which are expected in Mošnov and Ostrava, although in the past this harbor was planned in Vrbice and other localities such as Bohumin or Vernovice appear.

7.9.2. Poland

The implementation of the Euriskoala Sławków as one of the key nodes next to the Silesian Logistic Center is crucial for the development of freight transport in the TRITIA cross-border area (in the context of the Adriatic-Baltic corridor). In this context, it is important to treat the trade with the countries of Eastern Europe and Asia) and improve road transport in the area of Euroterminale. The key hubs on the Polish side are the Silesian Logistics Center and Euroterminal Sławków. The key line infrastructure alongside the aforementioned waterways includes A1 and A4 motorways. It is also necessary to invest in the rail transport line infrastructure (getting to the nodes and modernizing the infrastructure).

7.9.3. Slovakia

From the existing terminals in the SR, the following terminals do not meet the requirements of the AGTC to the decisive extent: the container cradle in Bratislava ÚNS, the Bratislava port, Žilina and Sládkovičovo. Terminal in Dobrá (Čierna nad Tisou) partially meets and the terminal in Dunajská Streda is approaching the requirements to the fullest extent, it reload only the containers. The main limiting factors of intermodal translation are:
- inadequate length of folding tracks,
- inadequate means of handling in terms of their number, load capacity, handling speed and the ability to handle all Intermodal Transport Units (hereinafter IPJ),
- insufficient storage areas within reach of handling equipment, requiring increased IPJ handling,
- high transport time due to insufficient train speeds on the lines covered by the AGTC,
- high transport costs.

Wider neighborhood of Žilina is attractive in the market of intermodal transport in two positions:
- a function within the European logistics network - exports and imports between Slovakia and the EU and other countries (Russia)
- regional logistics - local logistics

Žilinský region has great potential in intermodal transport. The Terminal of Combined Transport of International Importance is currently in operation, with the abovementioned factors (Railway Cargo Operator - ČSKD INTRANS, s.r.o.), where the capacity of the Combined Transport Terminal is 28,060 TEU / year. The terminal operates regular complete trains:
- Koper - Žilina and back: up to 5 trains in both directions weekly
- Žilina - Kaliningrad back: up to 12 trains in both directions weekly.

Another narrow place is the Terminal Intermodal Transport in Teplička nad Váhom, where the tender for the terminal operator is underway. Terminal meets the terms of AGTC. The Terminal is the central terminus for Northern Slovakia with connections to international trade with EU countries, Russia and Asian countries. An attractive terminal is 80 km away, allowing the entire Žilinský Region, the northern districts of the Trenčian Region, the Ostrava region in the Czech Republic and the southern part of the Silesian Voivodeship in Poland.

7.10. Predictable driving times

7.10.1. Czech Republic

The foreseeable travel time factor is a carrier or logistics issue and is not usually managed by the owner of the transported product. In view of congestion, accidents and transport network capacities, water transport is the most dependable type of freight transport due to predictable driving times. Rail freight transport in the Czech Republic faces reduced track and station capacity after modernization of corridors, road traffic is loaded with delays in the order of hours in the critical periods of the beginning and the end of the day and the working week. Predictable driving time based on data of average speed mentioned in chapter 7.4. Real average speed on main line Praha-Ostrava is about 30 km/hod (about 10 hours from Praha to Ostrava).

Doubts in predictable driving times in Moravian-Silesian region are:

- Insufficient capacity of parking lots in road transport
- Insufficient capacity of railway in section south-west - Ostrava

7.10.2. Poland

Chapter was not described. Problems are only in case of occasionally peaks or accidents.

7.10.3. Slovakia

The ŽSK, which neighbors with the Czech Republic and Poland, has a relatively dense network of border crossings on its territory. The most important border crossings with the Czech Republic are Svrčinovec - Mosty u Jablunkova on route I / 11, Makov - Bílá - Bumbálka on route I / 18. The SR and the Czech Republic join route II / 484 (Klokočov - Bílá) and route III / 11079 (Čadca - Milošová - Šance). Border crossings with the Republic of Poland are Skalité - Zwardoň on route I / 12, Trstená - Chyžne on route I / 59, Suchá Hora - Chocholów, which is on route II / 520. At the other border crossings with Poland, the limit for freight traffic is up to 7.5t. These are Bobrov - Winiaczykówka passages (III / 520013), Oravska Polhora - Korbielów (I / 78) and Novoť - Ujsoly (III / 520006).
The D3 motorway, along with the R5 highway, is an important link between three neighboring states of the Slovak Republic, the Czech Republic and the PL and three major industrial centers in Žilina - Ostrava - Katowice. From the point of view of transport, they represent a significant transport link in the north - south direction and in the direction of the D1 motorway also in the west - east direction. In the section Svrčinovec - Skalité - št. the border with Poland is running halfway traffic. Route I / 11, which until the construction of the D3 motorway is completed, constitutes a road transport infrastructure in the districts of Čadca and Kysucké Nové Mesto, which does not correspond to the capacity it is exposed to, due to the transit traffic carried out by approximately 40% of the vehicles on this road . Based on the reading of traffic intensities in 2015, it is clear that more vehicles cross the line per day on the TEN-T basic network, mainly on the D3 line (in unrealized sections measured on I / 11) with an intensity exceeding 20,000 vehicles in the section Žilina - Kysucké Nové Město and 18 thousand vehicles in the Kysucké Nové Město - Čadca section.
Driving times are often affected by the high intensity of road traffic on individual road sections. The driving time can be defined as the difference between the actual time of departure from point A and the actual time of arrival at point B.
Unpredictable situations that may affect driving time:
- congestion,
- accidents,
- work on the road, maintenance,
- change of traffic sign,
- weather effects,
- the impact of third parties.

The predicted driving times are shown in the following table where the traffic points have been determined. Time Availability Analysis was conducted for automotive traffic and the time to reach the area of interest within four time intervals was investigated: morning peak (05:00 - 08:00), morning saddle (08:00 - 13:00), afternoon peak (13:00 - 17:00) and evening

saddle (17:00 - 23:00). The figures in the table are given for the estimated time of the estimated driving time. Within the city of Zilina as an important industrial center, we determined the starting point / destination industrial zone on the street Pri Rajčianke 2931/35. Other starting points are the border points of the Czech Republic (Svrčinovec - Mosty u Jablunkova, Makov - Bílá - Bumbálka) and PL (Skalité - Zwardoň).
For ideal traffic, the driving time of I / 60 - I / 11 - D3 in the direction of Žilina - SR / PL and SR / PL - Žilina would be 44 minutes and I / 60 - I / 11 - I / 12 the ideal driving time would last 47 minutes. The driving time for the ideal traffic on the Žilina - Slovakia / Czech Republic route, along I / 60 - I / 11, would last 35 minutes. The driving time for an ideal traffic on the road section of Žilina - SR / CR along I / 61-D1-I / 10 is 40 minutes and I / 61- I / 10 would take 42 minutes.

Table 46 – predicted driving times, Slovakia

	Line/ road number	km	Predicted driving times			
			Morning peak	Morning weak	Afternoon peak	Afternoon weak
	Žilina–št. hr. SR/PL (I/60 - I/11- D3)	53,3	50 min. – 1h 15 min.	50 min. – 1h 20 min.	55 min. – 1h 25 min.	45 min. – 55 min.
	št. hr. SR/PL – Žilina (D3- I/11- I/60)	53,3	50 min. – 1h 15 min.	50 min. – 1h 20 min.	1h- 1h 25 min.	45 min. - 1h
	Žilina –št. hr. SR/PL (I/60 - I/11- I/12)	51,2	55 min. – 1h 20 min.	55 min. – 1h 25 min.	1h – 1h 25 min.	55 min. – 1h 15 min.
	Št. hr. SR/PL - Žilina (I/12 - I/11- I/60)	51,2	50 min. - 1h 5 min.	50 min. – 1h 5 min.	50 min. – 1h 5 min.	45 min. – 55 min.
	Št. hr. SR/ČR – Žilina (I/11 – I/60)	39,0	40 min. – 1h 5 min.	40 min. – 1h 10 min.	45 min. 1h 15 min.	35 min. - 1h

	Št. hr. SR/ČR – Žilina (I/10 - D1- I/61)	47,1	40 min. – 55 min.	40 min. – 50 min.	45 min. – 55 min.	40 min. - 50 min.
	Žilina – št. hr. SR/CR (I/61 – D1 - I/10)	47,1	40 min. – 50 min.	40 min. – 50 min.	40 min. – 55 min.	40 min. – 50 min.
	Žilina – št. hr. SR/CR (I/61- I/10)	45,2	40 min. – 50 min.	40 min. – 50 min.	40 min. – 50 min.	40 min. – 45 min.
	št. hr. SR/CR - Žilina	45,2	45 min. – 50 min.	45 min. – 50 min.	45 min. – 55 min.	45 min. – 50 min.

Source: https://www.google.com/maps

Evaluation of the minimum and maximum predicted driving time in the section Žilina - Skalité, št.hr. SR / PL

During the morning peak on the road sections Žilina - st. hr. SR / PL (Bidirectional) and I / 12-I / 11-I / 160 is a minimum driving time of 50 minutes and 55 minutes in the I / 60-I / 11-I / 12 direction. This is true even in the morning sitting, where the minimum driving time is the same as in the morning peak and the afternoon saddle for the Žilina section of the road - no. hr. SR / PL (bidirectional). In the afternoon peak on the D3-I / 11-I / 60 and I / 60-I / 11-I / 12 sections, the minimum driving time is 1 hour, I / and I / 12-I / 11-I / 60 is 55 minutes. In the afternoon peak of the D3-I / 11-I / 60 and I / 60-I / 11-I12, the minimum driving time is 1 hour, with 55 minutes and 50 minutes in the I / 60-I / in section I / 12-I / 11-I / 60. At the morning peak, the estimated maximum driving time for I / 60-I / 11-I / 12 is 1 hour and 20 minutes and in the section Žilina - št. hr. SR / PL (in both directions) is 1 hour 15 minutes. On the I-60-I / 11-D3 roadside peak (bidirectional), the maximum travel time is 1 hour 20 minutes and 1 hour 25 minutes in the I / 60-I / 11-I / 12 section. In the afternoon, the maximum driving time is 1 hour 25 minutes, in the sections Žilina - st. hr. SR / PL (Bidirectional) and I / 60-I / 11-I12.

Evaluation of the maximum and minimum predicted driving time in the section Žilina - Svrčinovec, št.hr. SR / CZ

During the morning peak and the morning seat on the I / 11-I / 60 road section (bidirectional), the minimum travel time is 40 minutes. The afternoon peak is 40 minutes in the direction of Žilina - St. SK / CZ and in the afternoon seat it's 35 minutes in both directions. Maximum walking time in the morning peak is 1 hour 5 minutes, in the morning sitting is 1 hour 10 minutes and the afternoon peak is 1 hour 15 minutes.

Evaluation of the maximum and minimum predicted driving time in the section Žilina - Makov, št.hr. SR / CZ

Predicted minimum time of the section Žilina - Makov - št. hr. SR-CZ on the D1 motorway (in both directions) is 40 minutes, in the morning peak, the afternoon and the afternoon saddle. Similarly, it is also at the maximum predicted time, where it is 50 minutes in the morning and afternoon saddle, and in the afternoon peak the maximum travel time is 55 minutes in both directions. During the morning, afternoon and morning seat on the I / 10-I / 61 road section, the minimum travel time is 40 minutes and the maximum travel time is 50 minutes. In the opposite direction during the morning, afternoon toe, morning and afternoon seat, a minimum lap time of 45 minutes and a maximum lapse of 50 minutes is expected. In

the afternoon, the maximum travel time is estimated to be 55 minutes.
Based on the results of time availability analysis, it can be concluded that the availability of individual locations takes longer than the estimated time for ideal traffic. As a result of the increased driving time in selected sections, the increased traffic intensity is the result of unsustainable road infrastructure capacity, accident rates in locations such as Kysucké Nové Mesto, Čadca, Svrčinovec. The following table shows the estimated driving times after the construction of the D3 motorway and the R5 expressway.

Table 47 Expected driving times after construction of the D3 motorway and the R5 highway, Slovakia

Section	Lorry speed[km/h]	Line	Distance[km]	Driving duration[min]
Žilina – Svrčinovec št.hr. SR/CZ	90	D3 - R5	37,7	25
Žilina – Skalité št.hr. SR/PL	90	D3	51,4	34

After the construction of the D3 motorway, a 41-minute time savings will be made compared to the peak time in the Žilina-Št. hr. SR / PL (I / 60 - I / 11 - D3) and 51 minutes time savings in the afternoon peak. Similarly, it is in the section Žilina-št. hr. SR / PL on the I / 60-I / 11-I / 12 route, where a time saving of 46 minutes after D3 is built.
In the section Žilina - Svrčinovec št. hr. SR / CZ (I / 60 - I / 11), after the construction of the D3 motorway and the R5 highway, a 40 minute time saving will be achieved, comparing the maximum predicted driving times in the morning peak and the midnight peak for 50 minutes.
rail transport
Train travel time depends on the line speed on the given section but also on the time the train stays at the stations, for operational and handling reasons. The PN train travel times in the following table are selected from the ŽSR Scheduled Schedule (ZCP) of ŽSR, without station stays valid from 10 December 2017.

Table 48 Total driving times of selected trains, Slovakia

Section	Vlak	Driving duration
		[min]
Žilina –Čadca – Skalité	Pn	45
Čadca – Žilina zr. st.	Pn	38
Žilina – Púchov	Pn	35

Source: Data elaborated from ZCP 106 a ZCP 114, ŽSR 2017

In-service freight train (Pn): a train designed to transport a load between train stations, between bulk loading and unloading points;
The following table shows the highest line speeds on track sections.

Table 49 Top line speeds in sections, Slovakia

Section	Maximum track speed [km/h]	Distance[km]	Driving duration [min]
Žilina – Žilina (mimo - Budatín odb.)	100	1	1
Žilina (Mimo)- Krásno nad Kysucou	140	18	8
Krásno nad Kysucou - Čadca	100	11	7
Čadca – Čadca št. hr.	80	7	5
Overall Žilina – Čadca št. hr. line		**37**	**21**
Čadca – Skalité	100	13	8
Skalité – Skalité št.hr.	70	7	6
Overall Žilina – Skalité št. hr. line		**50**	**30**
Žilina – Žilina zr.st.	40	1	2
Žilina zr.st. – Považská Teplá	120	27	14
Považská Teplá - Púchov	100	18	11
Overall Žilina – Púchov line		**46**	**27**

Source: Data processed from the track tables, ŽSR

When comparing the maximum predicted driving times during the morning peak of road and rail transport, it is obvious that the time of train travel on railway infrastructure is significantly shorter. After construction of the D3 motorway and the R5 expressway, the transport time will be significantly reduced. Road transport time on road infrastructure will be down by 13 minutes compared with rail transport for the section Žilina - Svrčinovec št. hr. SR / CZ and 11 minutes for Žilina - Skalité št. SR / PL. Account should be taken of the fact that rail transport is able to transport more goods than road transport.

8. LEGISLATIVE CONDITIONS

„Czech Republic is an area that has the reputation of being able to commit dishonestly and committing offenses with impunity" says Josef Melzer, Vice-President of Česmada and co-owner of M + L Logistik source:zdopravy.cz 26.10.2018.

8.1. Donation policy

Some European countries have been approached to formulate and implement programs to help them meet EU targets, including increasing the share of waterborne transport in overall

cost performance. In the long run, for example, the Netherlands and France, the special notified program was Austria for a number of years (it was a subsidy program for the introduction of container lines).

8.1.1. Netherlands

In the Netherlands, for several years, the promotion of the use of inland waterways by private (and public) transport undertakings as an alternative to road transport. Support declared as "PPP" is based on a number of European and national documents and defined objectives - the most important is the achievement of a 30% share of inland shipping on transport performance. The relevant programs, notified by the European Commission (DG COMP), have been in place since 2001 and have been extended for 3 times. The program is transparent and market-neural.
The aid concerns in particular investments in port embankment walls, where 80% of the cost of public funding is provided, the private investor is participating in 20%. The subsidy may not exceed 50% of the total investment cost of the whole project. Other possible additional subsidies are limited by national government measures. The owner of the infrastructure remains the government, which gives the investor 10-year concession. Infrastructure can also be used by third parties. It is the investor's obligation to ensure the minimum specified value of the transfer (6%), otherwise the subsidy returns.
In the years 1998-2015, 104 projects were carried out on all types of waterways and for all types of goods. In the year 2015, these measures replaced 966,233 automobile transports; for the duration of the program, 9,852,709 trucks were downgraded to the road.

8.1.2. French

The French state-owned company "VOIES NAVIGABLES DE FRANCE" manages 2 incentive programs for the development of inland navigation:
PAMI Program - Modernization of the Park (Plan d'Aide à la Modernisation & à l'Innovation)
The program is subsidized by € 16.5 million and provides 20-30% of subsidies for specific equipment.
The PARM program - an incentive program for switching to another mode of transport
The program is subsidized at € 12.5 million and has 3 phases:

- feasibility study of modified logistics
- a trial phase with 1-2 boats to verify the functionality of the project
- operational phase = investment project: here the VNF concludes a contract with the forwarder for 1-7 years, where the VNF undertakes to pay annual subsidies, the amount of which is based on actual transport on waterways and the sender announces the total shipment for the duration of the contract

Both programs are EU-approved and are valid for 5 years.

8.1.3. Austria

In Austria, the "Nationaler Aktionsplan Donauschifffahrt" was established in 2006. This notified program had several measures, namely:

- improving infrastructure, in particular the removal of bottlenecks on the Danube
- shortening the maintenance and revisions of the navigation chambers

- port modernization
- stimulating industry to place production in ports
- support for South-European and Danube ports
- development of information systems
- modernization and greening of the Danube fleet
- education and social dialogue
- logistics training
- improving the combined transport function
- Subsidizing support for regular regular services (mainly containers)
- and many others

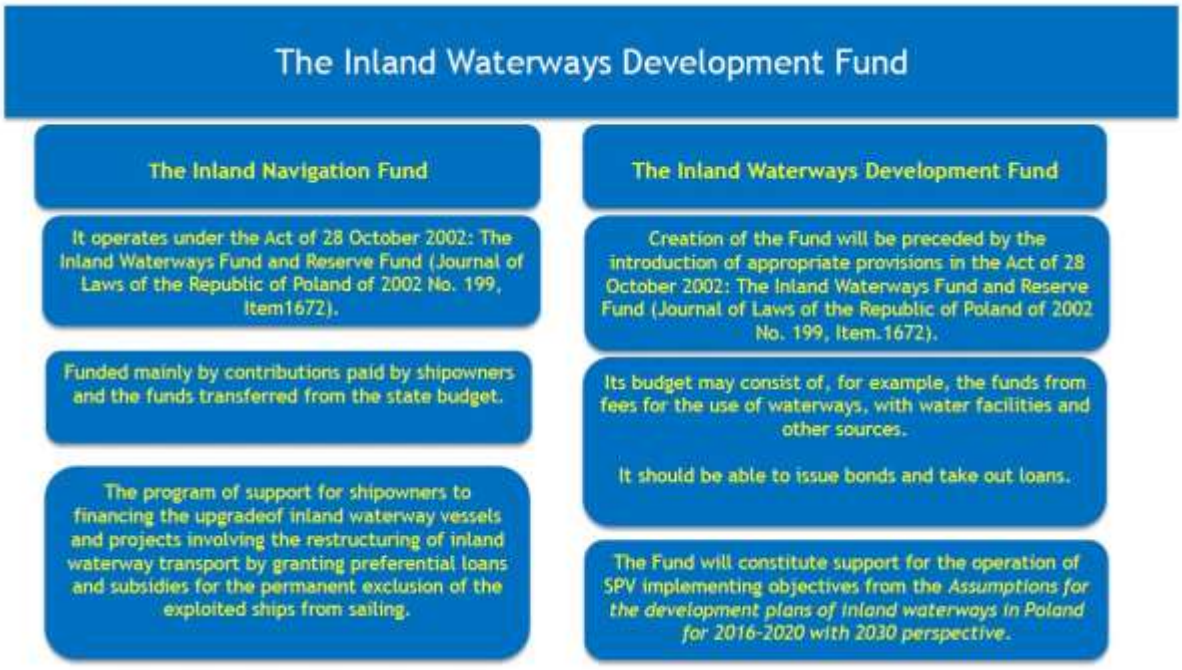
8.1.4. Poland

On the basis of the current Inland Navigation Fund, the Ministry of Maritime Economy and Inland Navigation developed assumptions for the operation of the Inland Waterways Development Fund (hereinafter: the Fund) which, similarly to the National Road Fund and the Railway Fund, could be the basis for the financing mechanism for investments on waterways, complementing the measures that is planned to be obtained from the above sources.

ASSESSMENTS FOR INLAND WATERWAY PROVISION DEVELOP PLANS IN THE FORM 2016-2020 WITH 2030 PERSPECTIVE

For the operation of the Fund, it will be necessary to determine its annual impact. It is envisaged that its budget may include, for example, funds from fees for the use of waterways, water facilities and other, for example from budget funds dedicated to the development of inland waterways or from state subsidies. The fund, in order to increase capital, should be able to issue bonds and take loans.

Figure 31 – The Inland Waterways Development Fund



The presented assumptions for waterway development (2016) are at the stage of developing a detailed Odra Waterway Development Program (point 8.6.2.).

8.2. Taking into account external costs and tax policy

The external costs are not yet clearly defined as well as their application for the charging of the transport route. Each study is usually immediately disputed by lobbyist groups. The process has been going on for decades without an exhaustive result.

8.2.1. Czech republic

Table 50 - transport cost classes

Category	Personal or company costs	External costs
Transport costs	Fuel, car, tickets, fees, maintenance	Costs paid by others (such as free parking spaces)
Infrastructure costs	Tolls, vehicle taxes (road tax), motorway stickers and part of excise duty on fuel	The user's uncovered infrastructure costs (usually paid from public budgets)
Accidents costs	Costs covered by insurance, costs of accidents borne by the participant itself	User uncovered costs of accidents (eg pain and suffering caused by others)
Envirinmental costs	Damage (eg health from emissions)	User uncovered environmental damage (eg harassment of other noise)
Congestions costs	Own lost time	Costs of delay caused by others

Table 51 - Transport external costs per 1000 tonekm in CZK

	2018 Theoretic level	2018 Applied level	2030 Theoretic level	2030 Applied level prediction
Road	2200	280	2200	250
Railway	475	92	475	92
Water	425	0	425	1000 (D-O-L new sections)
Air	5125	1000	5125	1000

Source: http://edice.cd.cz/EDICE/IZD/izd3_01/extnakl.pdf - rok 1995 and own calculation

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 running at 100 km section of a low-traffic motorway

Total external costs	8-36 EUR
Average charges	12-24 EUR
Average charges for infrastructure	8,3 EUR
Scheduled fee in Germany	13 EUR
Actual fee in Switzerland	36 EUR

Zdroj: https://www.fd.cvut.cz/projects/k612x1do/ukazky/bc_pechota.pdf

8.2.2. Poland

External noise costs - in Poland it is about 0.4% of GDP (in the EU 0.1-2%) shares: roads 85%, railways 5%, Aviation 10%. Screens, planting, silent surfaces, vehicle structures, speed limits, traffic restrictions.
EU environmental costs 0.9-3% of GDP in Poland 0.6% of GDP. Shares: roads 95%, aviation 3%, rail 2%.
Costs of occupancy of the area 0.9% of EU GDP, in Poland 0.6% of GDP. Shares: roads 88%, aviation 2%, rail 10%.
Accident costs 2% of EU GDP in Poland 3%. Shares of 99% of the road, 0.5% aviation, 0.5% turn.

Table 52 - External costs of freight transport in Poland (PLN / 1000tkm price 1.1. 2015)

kategoria kosztów	Transport drogowy		Transport kolejowy	żegluga śródlądowa	transport morski
	s.dostawcze	s.ciężarowe			
wypadki	145,87	26,47	0,52	0	0
zanieczyszczenie dolnych warstw atmosfery	46,46	17,39	2,86	14,02	5,89
zmiana klimatu	44,34	9,92	1,17	3,5	1,47
hałas	16,35	4,67	2,6	0	0
kongestia (koszty opóźnień)	108,02	35,97	0	0	0
	koszty zewnętrzne transportu towarowego w Polsce (PLN/1000 tkm, ceny 1.01.2				

8.2.3. Slovakia

Road transport

Table 53 - Cost classification in road freight transport, Slovensko

Category of costs	Own costs	External costs
Cost of the means of transport	Fuel costs, tire costs, engine and gear oil costs, treatment and maintenance of the semi-trailer, dispose of the used means of transport, leasing costs.	Occupancy of the public area (parking)
Infrastructure costs	Toll costs, highway fees, road tax, motor vehicle tax,	Costs for building, developing and upgrading infrastructure (paid from the state budget)
Accidents costs	Compulsory contract insurance, crew insurance, emergency insurance,	User Uncovered Cost of Accidents (eg pain and suffering caused by others)
Envirinmental costs	Environment damages	Costs of emissions, noise and vibrations
Congestions costs	Cost of your own time	Lost Time Costs

Railway transport

Table 54 - Cost classification in railway freight transport, Slovensko

Category of costs	Own costs	External costs
Cost of the means of transport	Fuel costs or traction costs, regular maintenance costs, costs of technical operations before and after driving,	
Infrastructure costs	Payments for access to railway infrastructure: - payment for the minimum access packet - payment for track access to service facilities (payment for the use of power supply equipment for the supply of electricity, payment for access to train set-up facilities and freight terminals in the ownership or management of the regulatory body) Depositing costs (Depa rent)	Costs for building, developing and upgrading infrastructure (paid from the state budget)
Accidents costs	The cost of security certification, Insurance to cover liability for damage caused by the provision of transport services in the network,	
Envirinmental costs	Damages to the envirinment	Costs of emissions, noise and vibrations
Ancillary services costs	Rental of premises and land, special services for the repair and maintenance of rolling stock	

Internalizing negative externalities in rail transport:
- mineral oil tax
- emission limits,
- noise charges,
- enabling free market entry, the separation of transport infrastructure from operation,
- Normative instruments should be oriented in such a way that freight wagons and locomotives will have the values of passenger train emissions in the long run.

The prices in the following tables are converted to the price level for 2018.

Table 55 - Compared external costs in transport, Slovakia

Indicator	**[EUR,2018]**
Average Unit Value of Time Costs for Passenger Cars, Trucks and Trains [EUR /	
business trips	16,79
getting to work	7,04
other (private)	5,91

Average unit cost of time for buses [EUR / tax]	
business trips	13,48
getting to work	5,06
other (private)	4,25
Unit social costs of accidents [EUR / DN]	
Fatal accident	2 096 085
Heavy injury	289 083
Easy injury	20 658
Material damage	3 497
Unit Value of Pollutant Emissions *[EUR/t]*	
NOx	28 278,07
NMVOC	2 248,72
SO_2	22 545,08
$PM_{2.5}$ (rural)	71 093,20
$PM_{2.5}$ (urban)	298 044,06
Jednotková hodnota nákladov na CO_{2e} [EUR/t]	39,22

Table 56 - External noise costs in transport, Slovakia

Unit external road noise costs per 1000 carriages [in EUR, 2018]					
Type of car	**Day period**	**Transport intensity**	**Urban**	**Suburban**	**Interurban**
Car	Day	High	7,21	0,45	0,11
		Low	17,68	1,13	0,11
	Night	High	13,29	0,68	0,11
		Low	32,22	2,14	0,34
Motorbike	Day	High	14,64	0,9	0,11
		Low	35,37	2,25	0,34
	Night	High	26,58	1,58	0,11
		Low	64,32	4,17	0,45
Bus	Day	High	36,38	2,03	0,34
		Low	88,42	5,63	0,68
	Night	High	66,35	3,72	0,56
		Low	160,85	10,48	1,24
Truck up to 3,5 tony	Day	High	36,38	2,03	0,34
		Low	88,42	5,63	0,68
	Night	High	66,35	3,72	0,56
		Low	160,85	10,48	1,24
Truck above 3,5 tony	Day	High	66,91	3,72	0,56
		Low	162,43	10,48	1,24
	Night	High	122,1	6,87	1,01
		Low	296,02	19,15	2,14
Unit external road noise costs per 1000 train/km [in EUR, 2018]					
Type of train	**Day period**	**Transport intensity**	**Urban**	**Suburban**	**Interurban**
Passanger	Day	High	225,96	10,03	12,39

		Low	446,4	19,71	24,56
	Night		745,01	32,89	41
Freight	Day	High	400,67	19,71	24,67
		Low	966,47	38,3	47,76
	Night		1634,21	64,66	80,76

8.3. Unification of regulations between TRITIA countries

8.3.1. Czech Republic

Thought cros border water transport is not applicated in TRITIa area, international conventios are valid.

Table 57 International inland waterway transport at TRITIA area – international conventions

Country	International convention
Czech republic[1]	1) Council directive 91/672/ES of 16 December 1991 on the reciprocal recognition of national boatmasters' certificates for the carriage of goods and passengers by inland waterway. Council Directive 96/50/EC of 23 July 1996 on the harmonization of the conditions for obtaining national boatmasters' certificates for the carriage of goods and passengers by inland waterway in the Community. Directive 2005/33/EC of the European parliament and of the council of 6 July 2005 amending Directive 1999/32/EC as regards the sulphur content of marine fuels. Directive 2005/44/EC of the European parliament and of the council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community. Directive 2006/87/EC of the European parliament and of the council of 12 December 2006 laying down technical requirements for inland waterway vessels and repealing Council Directive 82/714/EEC. Council Directive 87/540/EEC of 9 November 1987 on access to the occupation of carrier of goods by waterway in national and international transport and on the mutual recognition of diplomas, certificates and other evidence of formal qualifications for this occupation. Directive 2008/68/EC of the European parliamend and of the cuncil of 24 September 2008 on the inland transport of dangerous goods. Commision directive 2010/61/EU of 2 September 2010 adapting for the first time the Annexes to Directive 2008/68/EC of the European Parliament and of the Council on the inland transport of dangerous goods to scientific and technical progress. Council directive 2014/112/EU of 19 December 2014 implementing the European Agreement concerning certain aspects of the organisation of working time in inland waterway transport, concluded by the European Barge Union (EBU), the European Skippers Organisation (ESO) and the European Transport Workers' Federation (ETF). 2) Council regulation (EEC) No 2919/85 of 17 October 1985 laying down the conditions for access to the arrangements

[1] Act. No. 114/1995 Coll. about inland navigation

Country	International convention
	under the Revised Convention for the navigation of the Rhine relating to vessels belonging to the Rhine Navigation. Council regulation (EEC) No 3921/91 of 16 December 1991 laying down the conditions under which non-resident carriers may transport goods or passengers by inland waterway within a Member State. Regulation (EU) NO. 1177/2010 of the European parliament and fo the council of 24 November 2010 concerning the rights of passengers when travelling by sea and inland waterway and amending Regulation (EC) No 2006/2004

8.3.2. Poland

The chapter is not described separately, because regulations in chapters 8.3.1 and 8.3.3 are valid for chapter 8.3.2 too.

8.3.3. Slovakia

The position of Slovakia and its exploitation of the advantages as a transit country is evident especially in the area of rail freight transport. In this respect, it is interesting to compare the price level of the fees for the use of the railway transport route in the international rail transport mode between Slovakia and neighboring countries. The state regulates the price so that the rail transport is able to compete with road transport. The Rail Travel Fee (ZDC) is determined on the basis of Decree No. 3/2010 of the Railway Traffic Control Authority of 2 December 2010 on the determination of the fees for access to the railway infrastructure, which sets the maximum payment for access to the railway infrastructure within the scope of the minimum access package and the line access to the service facilities. The maximum reimbursement for access to setting stations and train builders and to costly terminals owned or managed by a regulated entity depends on the category of the point of transport and the number of use of such equipment.
The objectives of rail freight transport have been transformed into legislative measures of the European Union where the main objective is to open the market, ensure non-discriminatory access and promote interoperability and security. In the EU (no. No 913/2010 specifically calls for the establishment of a "one-stop shop" for each rail freight corridor in order to manage requests for infrastructure capacity for freight trains crossing at least one border along the corridor. One of the technical elements that can limit traffic is the current state of railway infrastructure, cooperation with infrastructure managers and track capacity. From the point of view of the track capacity as mentioned in subchapter 7.3.3, there are no problems with line section throughput on the whole railway infrastructure.

There are agreements between TRITIA countries and the Slovak Republic, namely:
- AGREEMENT between the Government of the Slovak Republic and the Government of the Czech Republic Concerning Railway Transport across the State Border.
- Agreement between the Government of the Slovak Republic and the Government of the Republic of Poland on Rail Transport Abroad.

These agreements are intended to assist the further development of rail transport, taking into account the provisions of the international agreements to which they are party. The Contracting Parties shall implement all measures necessary for the operation of the railway under this Agreement. The connection and transit service on the border lines of States Parties shall take place at border stations (exchange stations).

Agreement on the International Carriage of Goods by Rail
This Agreement governs the carriage of goods from countries whose railways are parties to this Agreement through transit through countries whose railways are also parties to this Agreement to countries whose railways are not party to this Agreement and is implemented in the opposite direction by the Code and in accordance with the provisions of at the transit tariff used by the participating railways for the relevant international carriage, unless another agreement on direct international carriage of goods by rail is used. This Agreement shall be binding on the railways, consignors and recipients of goods and shall be valid independently of the nationality.
The Agreement on International Carriage by Rail (COTIF) brings together the Contracting Parties - the Member States to the Intergovernmental Organization for International Carriage by Rail (OTIF). Its members are all EU countries. The Uniform Rules for the CIM International Carriage of Goods Agreement are Appendix B to the COTIF.

Rail interoperability is regulated by EU legislation, with the following directives:
- DIRECTIVE 2008/57 / EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 June 2008 on the interoperability of the rail system within the Community (recast)
- REGULATION (EU) 2016/796 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 May 2016 on the European Railway Agency, repealing Regulation (EC) 881/2004
- 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
- DIRECTIVE (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on rail safety

8.4. Overzice transport authorization

As illustrated by the following tables and comparisons, legislation in the individual countries of the TRITIA region is scattered, disparate, different and unifying the conditions, or at least approximating them would be very necessary and would speed up the processes of approving individual transports, their conditions, etc. the view that the ports in the territory of PL could be used until the construction of ports in the Czech Republic (Ostrava or Mošnov).

Table 58 Heavy transport regulations

Question	Answer
What legislation regulates the oversized transport ?	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 – Road transport:

	1 Act of 18 August 2011 amending the act - Road Traffic Law and certain other acts (Journal of Laws No. 222, item 1321) 2. Act of 21 March 1985 on public roads (Journal of Laws of 2004 No. 204, item 2086); 3. Regulation of the Minister of Infrastructure of 31 December 2002 on the technical conditions of vehicles and the scope of their necessary equipment (Journal of Laws from 2003 No. 32, item 262, as amended) 4. Regulation of the Minister of Transport, Construction and Maritime Economy of 22 June 2012 on permits for passage of non-normative vehicles (Journal of Laws of 2012, item 764) 5. Regulation of the Minister of Transport, Construction and Maritime Economy of March 28, 2012 on the amount of fees for issuing a permit for a non-normative vehicle (Journal of Laws of 2012, item 366) 6. Regulation of the Minister of Transport, Construction and Maritime Economy of May 23, 2012 on the piloting of non-normative vehicles (Journal of Laws of 2012, item 629) 7. Regulation of the Minister of Interior and Administration of December 30, 2002 on road traffic control (Journal of Laws from 2003 No. 14, item 144, as amended); 8. Act of 6 September 2001 on road transport (Journal of Laws of 2004 No. 204, item 2088) <u>Railway transport:</u> • Regulation of the Minister of Transport of June 7, 2006 on the type and conditions of transport of things that may cause transport difficulties in the rail transport • Instruction on the transport of extraordinary shipments Ir-10 (R-57) Regulations for the carriage of cargo shipments (RPT) of PKP Cargo S.A. • Regulations for the allocation of train paths and the use of allocated train paths by licensed railway carriers within the schedule of trains 2013/2014 - PKP PLK S.A. Regulations of PKP CARGO S.A. on loading and securing cargo shipments (CH6) Inland navigation: 1. Regulation of the Minister of Infrastructure of April 28, 2003 on shipping regulations on inland waterways, Dz.U. 2003 No. 212, item 2072 2. Local law regulations issued by territorially competent directors of inland navigation offices, for example in relation to the lower section of the Odra River, are: • Ordinance of the Director of the Inland Navigation Office in Szczecin of June 7, 2004 on local law on inland waterways, • Ordinance of the Director of the Inland Navigation Office in Szczecin dated 4 December 2009 on sailing on the boundary waters of the Odra River, the Western Odra River and the Nysa Łużycka River. 3. Regulations regarding the safety of the vehicle structure, which results from stability and stability documentation and legal provisions, e.g. for ships with IMO resolutions and codes

<table>
<tr><td>Is in your country/region a route map of oversized goods in your country/region available?</td><td>CZ – No
SK -http://www.cdb.sk/sk/Urcovanie-tras-pre-prepravu-NNN/statisticke-udaje-o-NNN.alej
PL - Yes, the list of national roads and highways is in the appendix to permit category VI.- concerns only this category, the rest depend on the obtained permits</td></tr>
<tr><td>Exists in your country/region database of oversized/heavy transports ?</td><td>CZ – No, only traffic information (mobility, accidents, restriction)
SK -http://www.cdb.sk/sk/Urcovanie-tras-pre-prepravu-NNN/statisticke-udaje-o-NNN.alej
PL - The Oversize Baltic project assumed, among others, the launch of a database on available routes of oversize transport.
Besides, as in CZ general information about traffic volume, modernization of routes, etc. is available (https://www.gddkia.gov.pl/)</td></tr>
<tr><td>Are in your country a websites information focused on transport information, transport closurings, warning of oversized transport ?</td><td>CZ – http://www.dopravniinfo.cz
SK - http://www.zjazdnost.sk/map/view.html Information and warning about oversized / heavy transport is also reported in local media
PL- Informationabout traffic, route modernization, accidents, weather conditions impact on the road condition:
1. https://www.gddkia.gov.pl/)
2.http: //www.v-traffic.pl/
3. https://www.traxelektronik.pl/pogoda/drogi/index.php</td></tr>
<tr><td>Are reqiured a private or other accompanying vehicles ?</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="9">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="2">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>
</table></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<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?</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 –mainly private escort. The police are piloting the carriage of non-normative cargo if at least one of the conditions from the following list is met: the width of the roadway (with the side of the same structure as the roadway) left for the opposite direction of traffic on a two-way street or for the same direction of traffic is less than 2,5m (unless it is a short section and adequate visibility is provided, then it is not required);
the length of the vehicle or vehicle combination is greater than 40 m;
the total length of the piloted vehicles is greater than 120 m.</td></tr>
<tr><td>How are solve of divisible load ?</td><td>CZ –Czech law does not specify an indivisible load
SK - As a “repeated transport” according to TP 103, chapter 2.10
PL -The Act - Road Traffic Law and some other acts of August 18, 2011 define the concept of indivisible cargo.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</td></tr>
<tr><td>Are in your region/country a interest groups or associations dealing with the transport of excessive costs ?</td><td>CZ – ČESTAND – http://www.cestand.cz , ČESMAD Bohemia – http://www.prodopravce.cz
SK - ČESMAD Slovakia - https://www.cesmad.sk
PL - Ponadnormatyvni - Polish Association of Employers of Non-Normative Transport - http://ponadnormatywni.pl/
Górnośląskie Stowarzyszenie Przewoźników Drogowych - http://www.gspd.pl/</td></tr>
<tr><td>Which authorities are competent to permission?</td><td>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
- Depending on the category of permits, they are responsible for issuing: category I licenses - road manager, category II and III licenses - category IV-VI - permission GDDKiA or the head of the customs office (when entering the territory of the Republic of Poland), category VII permits - GDDKiA or the president of the city (if the non-standard vehicle transit route runs within the administrative borders of the city with poviat rights and does not run on the motorway or express road).</td></tr>
</table>

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 –1. Required documents: a) Application for a permit for passage of a non-normative vehicle b) Appendices to the application: proof of payment of the fee for issuing the permit; 2. Documents for inspection a) the identity document of the applicant or b) power of attorney (in the case of acting by a proxy).
Are in your country a long-term permits in your country?	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 single route:** The period of validity of permits for individual categories: • I category - 1.6, 12 months • II-VI - 1,6,12,24 months • VII - 14 days 1-way trip, 30 days - multiple trips Details about their type, the size of fees are presented in the table https://www.gddkia.gov.pl/userfiles/user/236/TABELA%20kategorii%20zezwolen%20i%20oplat.pdf
Is there an electronic system for applying for authorization?	CZ – **No** SK - **https://ismcs.cdb.sk/portal/Trasy/Trasovanie/Trasovanie.aspx , https://www.ndsas.sk/sluzby/posudenie-prepravy/prihlasenie** PL – **No, all permits are issued on paper**
Are available to download the price list, documents or forms ?	**https://www.slov-lex.sk/static/pdf/1995/145/ZZ_1995_145_20180315.pdf - Items 80, 80a in the Annex to the Act** **PL**- Yes - https://www.gddkia.gov.pl/pl/18/przejazdy-nienormatywne

How long it takes processing of application form for permission?	CZ – **30 days (60 days for difficult transports)** SK - **within 30 or up to 60 days** PL – **from 3 to 30 days**