

## DYNAMICS OF TRANSPORTATION DEVELOPMENT AS A BASIS FOR THE DEVELOPMENT OF LOGISTICS IN POLAND

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**Abstract:** Transportation is one of the main aspect of logistics development in Poland, even if this is due to the fact that the costs for transportation are from 25% to 40% of total costs in the total cost of logistics. This causes that it is transportation, in addition to procurement processes, production, storage and distribution is the most important process within the logistics supply chain. This article on production and transport being the type used in the Polish logistics, presented as in the period 2009-2011 was as its dynamics and development.

**Key words:** transport, mode of transport, goods, road transport, rail transport, air transport, maritime transport, pipeline transport,

### Introduction

The logistics management, in addition to processes such as purchasing, inventory management, location of plants and warehouses, planning, production, storage, transportation-house management, procurement procedures and protective packaging is also under construction. Transport is one of the key elements in the logistics. Modern transport processes are characterized by a high consistency and being integrated with each other are crucial for the domestic and international supply chains [1]. It is one of the most important activities because very often, about 25% of the cost of logistics management in the company, takes place right on transport management [2]. Transportation is "activity aimed at overcoming space. In economic terms it consists of reward services that result in the movement of people and goods and the creation of support services directly linked "[3]. The concept of transport is a wildcard and can represent [4]:- zespół czynności – które związane są z przemieszczaniem się osób i towarów przy pomocy odpowiednich środków,

1. - Acts of the economy - covering all measures and actions aimed at moving people and goods,
2. - Field of knowledge - which deals with all the phenomena associated with the movement of people and goods.

In the process of managing transportation and performs three main functions [5]:

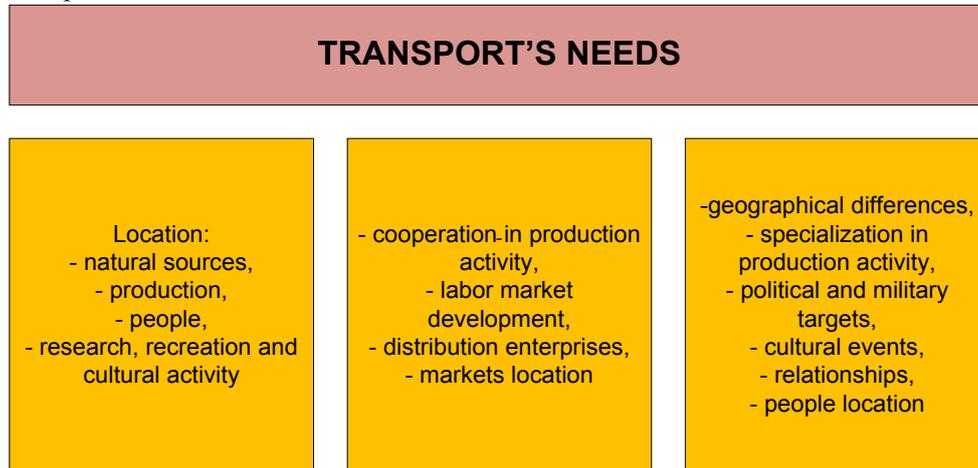
1. Consumer - it means meeting the needs of transport for the transport services provided,

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2. Manufacturing - means meeting the needs of production by the transport services provided,
3. Integration - with transport services following the integration of state and society.

The importance of transport due to its links to almost all forms of human activity and that the needs of the societies and economies can be met only by transportation.



**Figure 1. Factors determining transport's needs**

Source: Autor's own work based on Mindur M., „Efektywny transport czynnikiem wzrostu konkurencyjności gospodarki narodowej”, w: Michałowska M., „Efektywny transport – konkurencyjna gospodarka”, Akademia Ekonomiczna, Katowice 2009, p. 37.

The transport logistics activity is directly responsible for the movement of goods between the following points: factory, warehouse, retail outlet or wholesale outlets. Transportation in its essence is the link between components such as:

- Purchasers,
- Manufacturers of finished and semi-finished products,
- Wholesalers, retailers and brokers,
- Finally the customer,

In addition to storage and mechanical handling, transport is one of the fundamental tasks of logistics. However, its role is not limited to the fact that it is one of the core areas of logistics, thanks to him, are also carried out activities related to the supply, distribution, handling returns, stocking and customer service.

### **Modes of transport used in Poland**

In Poland, the main modes of transport, which are subject to management processes of transport are:

- Road transport - is the most popular mode of transport used in Poland, this is due to several factors, the most important are: the immediacy and speed of traffic, the ability to transport all kinds of goods, high availability of means of transport, transport costs low and very high density of roads allowing to reach even the most remote destinations. Despite these features, Poland, road transport is the most commonly used to transport so. cargo over short or medium distances.

- Rail transport - the transport sector is much less used than road transport, as this is primarily due to a much lower density of railways, making it impossible to reach specific destinations. Most often, the branch is used to transport bulk cargo, for medium and long distances.

- Air transport - this is the newest mode of transport, however, is characterized by the most dynamic development. This mode of transport is most often used in international transport and intercontinental relations. Although it is the fastest mode of transport is also the most expensive, the most common means of transport is a valuable general cargo (eg accessories jewelry stores) or urgent consignments. However, this type of transport is also connected by road transport sector due to the fact that very often transported by air cargo must be transported from the airport to your destination.

- Pipeline Transport conjunction. otherwise the transmission allows the transfer of goods using pipelines, most are liquids (crude oil) and natural gas. The most important feature of this mode of transport is that it is cheap to run, it is so little affected by any weather conditions and it does not cause any negative effects that affect the environment. It is also the only mode of transport that can not be replaced, in addition to pipeline transport is a fast and practical transportation. [6]

- Inland waterways - its specificity lies in the fact that the natural system of roads is also its limitation of the possibility of its development. This system can be changed, mainly due to the construction of channels, however, these changes are not cost-effective, because lies behind a high cost in relation to the potential benefits of redevelopment. Depending on the conditions prevailing in the area, the river is properly used, the nature of changes that infrastructure investments consist primarily to deepen, regulation or sewage system. [7]

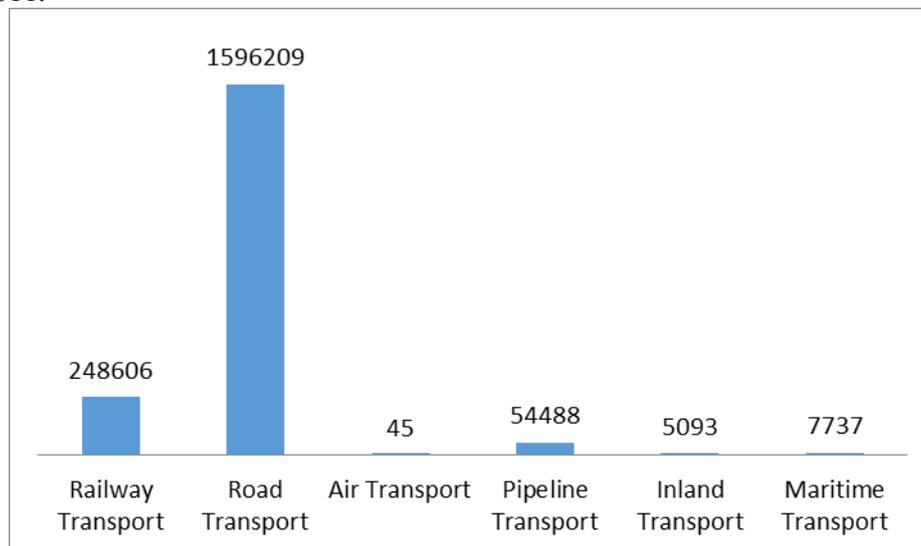
- Maritime transport - it's cheap and safe means of transport that is used to transport goods over long distances [8]. The main task of the maritime transport of bulk cargo is used in international trade or exchange [9]. The essence of maritime transport is the transport of cargo over long distances, because only in this case it is the most cost-effective transportation. The most commonly transported goods are mineral resources, iron ore and coal, all kinds of chemicals, food or intermediates

(mechanical parts) or finished products (cars) [10]. Loads that should not be transported by means of transport mainly marine loads that are sensitive to atmospheric action.

All these modes of transport are composed transportation management processes in the Polish economy, the effectiveness of which will be presented later in this article.

### Transport's development in Poland in the years 2009-2011

As shown in the following figure, the largest share of cargo transport is road transport, which, as mentioned before is the most popular means of transport used in Poland. Size of the transported cargo transport in 2011 was more than six times greater than the amount of freight transported by rail. In third place is pipeline transport, which in recent years has grown in importance, which led to its increased use. Size cargo transported using inland waterways and maritime ranks on the same level. However, in the last place is air transport, which, despite high growth development, including only a thousand of the total transported freight transport in 2011.

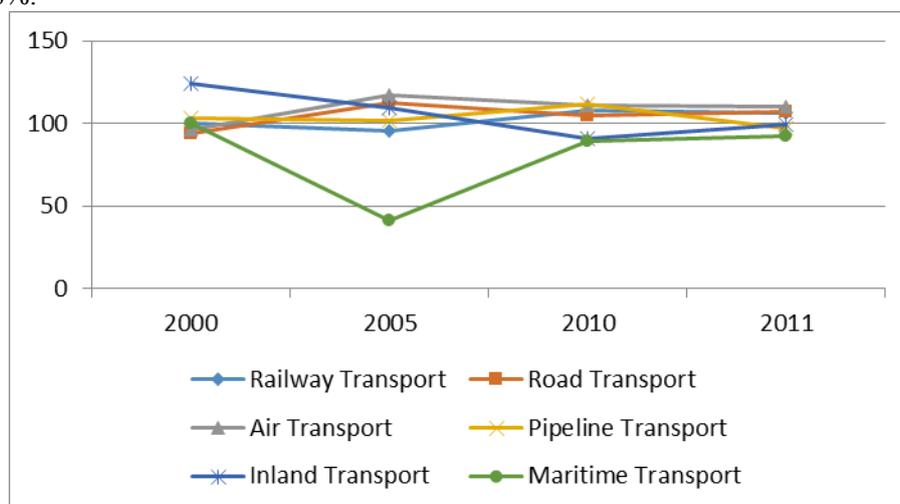


**Figure 2. Transport of goods by mode of transport in the year 2011**

Source: Autor's own work based on GUS „Transport – wyniki działalności 2011”, GUS, Warszawa 2012, p. 84.

According to data from the Central Statistical Office in 2009, 2010 and 2011, the growth in transport developed in a different way - in 2009, the growth rate compared to the year amounted to just 1.8%, while the growth rate in 2010

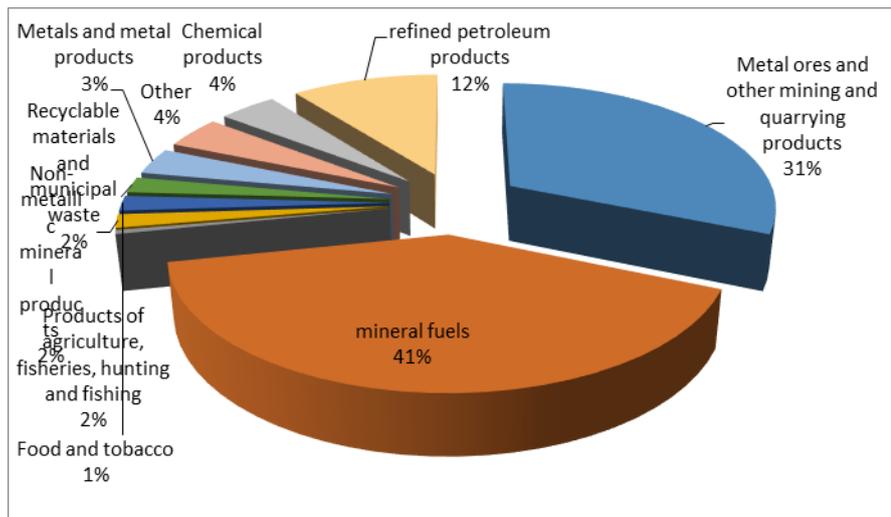
compared to 2009 was higher by 8.9%. Similar growth was recorded in 2011 – 8,8%.



**Figure 3. Dynamics of transport of goods**

Source: Autor's own work based on GUS „Transport – wyniki działalności 2011”, GUS, Warszawa 2012, p. 46.

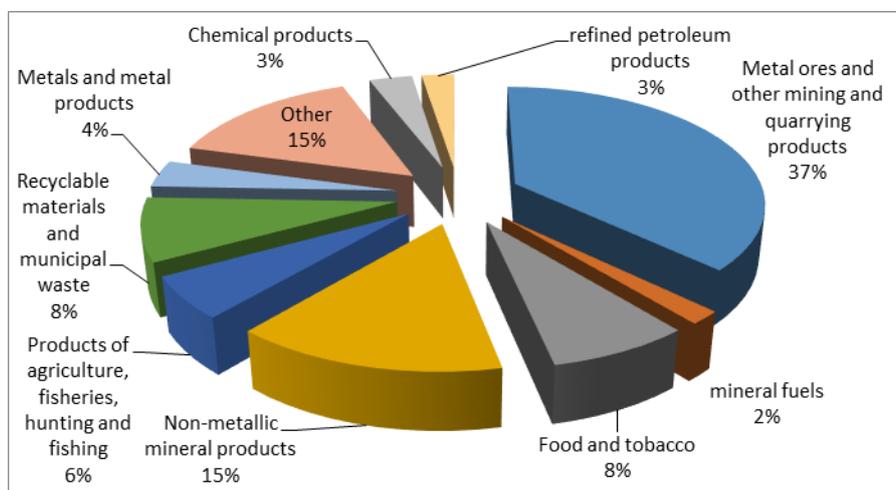
The decrease was recorded in transport road transport and shipping, while growth - in air transport, inland waterways and rail. The years 2009-2011 were the years of the most beneficial for transport by rail, which in 2011 transported 5.8% more cargo than the previous year. In addition, the measured tone-km rail transport Polish invests in second place among all 27 member states, just behind Germany. Also the road is under rapid development, in 2011, transported 10% more cargo than in 2010. This high value makes Poland is on the third place among all Member States, behind Germany and Spain. Also, a large increase was recorded in air transport, in 2011, transported 10% more goods than last year. However, a decrease was recorded by maritime transport - in the following years, the volume of freight fell by 10%. In the other two modes of transport - pipeline and inland waterways - were recorded only minor changes, and probably also in the following years the situation will not be a major change.



**Figure 4. The structure of goods carried by railway transport**

Source: Autor's own work based on GUS „Transport – wyniki działalności 2011”, GUS, Warszawa 2012, p. 62.

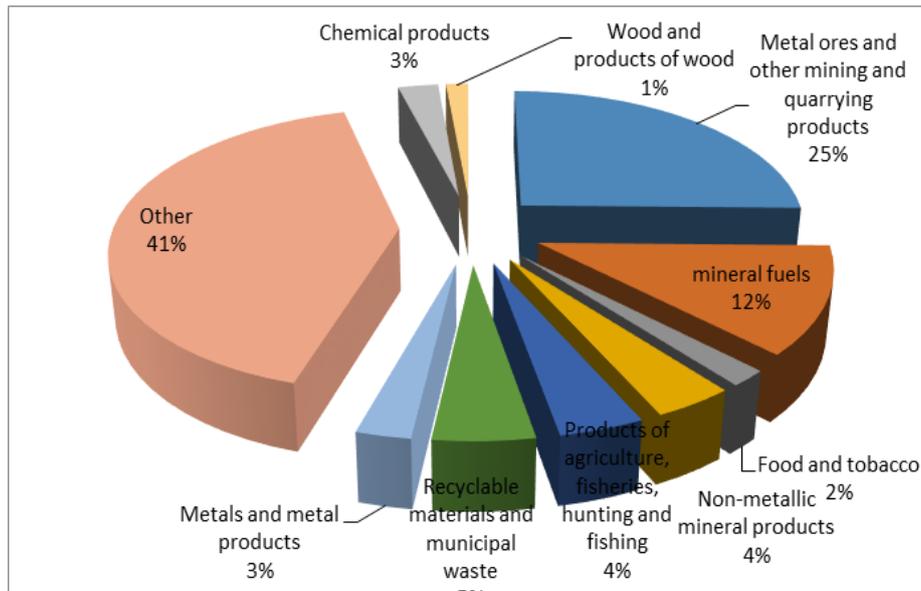
Most cargo transported by rail were mineral fuels and ores, along with other mining and quarrying products. In third place are coke and refined petroleum products. The remaining less than 20% of the freight transported by rail consists of a chemical products, hardware, groceries and tobacco products as well as recycling and waste.



**Figure 5. The structure of goods carried by road transport**

Source: Autor's own work based on GUS „Transport – wyniki działalności 2011”, GUS, Warszawa 2012, p. 67.

The most commonly transported cargo in road transport were mostly metallic and non-metallic products. In contrast to rail transport, the share of fossil fuels and metal ores did not exceed 2% and were rarely transported goods by road. This is due to the fact that both types of goods, are mainly transported by means of transport by rail, as shown on the previous chart.



**Figure 6. The structure of goods carried by inland transport**

Source: Autor's own work based on GUS „Transport – wyniki działalności 2011”, GUS, Warszawa 2012, p. 58.

As shown in the figure above, the largest share of inland waterways are the products of category "other", only hardware and mineral fuels are in second place in terms of their carriage. Other types of loads are spread more or less evenly and do not exceed 5% of the total. It should however be noted that the inland transportation of goods does not carry metal ores and other mining and quarrying products, while carrying wood and wood products, the share of which did not exceed 1%.

### Summary

As the analysis shows, the most widely used mode of transport is road transport - as mentioned before this is due to the fact that due to the high density of the Polish roads, the transport sector ensures the timely delivery of goods to almost anywhere. It is true that in addition to its advantages, road transport has a negative impact on the environment and also has a high terenochłonnością. But these flaws do not make it such that another mode of transport is rail transport is used increasingly. Despite the fact that this mode of transport is environmentally friendly and Polish rail network is characterized by a relatively high density. It is, however, relatively high transportation costs and the lack of an adequate offer, cause that transport is used insufficiently. Other modes of transport are used in minimally - branch pipelines used to transport oil and gas, shipping, due to the lack of proper infrastructure and the ship can not be sufficiently utilized. And air transport, despite the high growth development, is only a fraction of other modes of transport. The analysis also showed that the transport sector in Poland has risen from the time of the crisis, as shown by the rapid growth of its development, an average of nearly every mode of transport, from year to year, denotes growth rate of 10%.

### References

- [1]. Rudasz Z., *„Transport w działalności logistycznej”*,
- [2]. Coyle J.J., Bardi E.J., Calvinato J.L., *„Transportation”*, West Publ. Co., NY 1990, p. 67
- [3]. Pod red. Rydzkowskiego W., Wojewódzkiej-Król K., *„Transport”*, Wydawnictwo Naukowe PWN, Warszawa 2008, p. 1
- [4]. Rydzkowski W., Wojewódzka-Król K., *„Transport”*, PWN, Warszawa 2004, p. 140
- [5]. Mindur M., *„Efektywny transport czynnikiem wzrostu konkurencyjności gospodarki narodowej”*, w: Michałowska M., *„Efektywny transport – konkurencyjna gospodarka”*, Akademia Ekonomiczna, Katowice 2009, p. 37.
- [6]. Benaissa M., Benabdelhafid A., Akkouri Z., *„Quality Management Approach in Supply Chain Logistics Case of Shipping Maritime Transportation”*, Polish Journal of Management Studies, vol. 2/2010.
- [7]. Pod red. Szczepaniaka T., *„Transport i spedycja”*, PWE, Warszawa 1985, p. 14.
- [8]. Starostka-Patyk M., *„Integracja przepływów małych ładunków z intermodalnym systemem transportowym”*, W: Systemy logistyczne. Teoria i praktyka. I Międzynarodowa Konferencja Naukowo-Techniczna. Warszawa 2005.

- [9]. Guzewski T., „*Transport rurociągowy*”, Transport: Projektowanie i Zarządzanie, Eurologistics 2/2013
- [10]. Głowczyński S., Gronowski F., „*Żegluga śródlądowa*”, WKiŁ, Warszawa 1979, p. 118-119.
- [11]. Branch A.E., „*Elements of Shipping*”, Routledge, NY 2007.
- [12]. Frankel E.G., „*The World shopping industry*”, Croom Helm Publishers, NY 2002.
- [13]. GUS „*Transport – wyniki działalności 2011*”, GUS, Warszawa 2012.

**DYNAMIKA ROZWOJU TRANSPORTU JAKO PODSTAWA ROZWOJU  
LOGISTYKI W POLSCE**

**Streszczenie:** Transport jest jednym z najważniejszych aspektów rozwoju logistyki w Polsce. Jest to spowodowane chociażby faktem, że koszty ponoszone z tytułu transportu stanowią od 25% do 40% ogółu kosztów w całkowitych kosztach logistycznych. To powoduje, że właśnie transport, obok procesów zaopatrzenia, produkcji, magazynowania czy dystrybucji jest najważniejszym procesem w obrębie logistycznego łańcucha dostaw. Niniejszy artykuł po przedstawieniu istoty transportu i jego rodzajów wykorzystywanych w obszarze polskiej logistyki, prezentuje jak w okresie 2009-2011 kształtowała się jego dynamika i rozwój.

**Słowa kluczowe:** transport, gałęzie transport, dobra, transport drogowy, transport kolejowy, transport lotniczy, transport morski, transport rurociągowy

**動態交通的發展為物流業的發展，以此為基礎在波蘭**

**摘要：**交通物流發展的主要方面，在波蘭，即使這是由於這樣的事實，運輸成本是從25%到40%的總成本在物流總成本。這將導致，這是除了採購過程，運輸，生產，儲存和配送物流供應鏈內的最重要的過程。本文對生產和使用的類型，在2009-2011年期間在波蘭物流運輸的動態和發展