

EFFECTIVENESS OF MULTIMODAL TRANSPORT IN POLAND

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Abstract: The main aim of this paper is to discuss and evaluate multimodal transport effectiveness in Poland. The first part presents characteristics of multimodal transport and its division as well as the conditions facilitating operation of this type of transport. The next part offers an overview of multimodal transport in Poland, which is based on the data produced by the Central Statistical Office of Poland and other current publications on the subject. The following part presents the main barriers to the development of this type of transport as well as opportunities which could enhance its marketability. The last part of the paper is an analysis of multimodal transport effectiveness in Poland, which was conducted on the basis of its current situation in Poland, the number of freights and use of particular modes of transport among others. That was also the basis for the evaluation of multimodal transport effectiveness in Poland.

Keywords: multimodal transport, carriage of cargo, effectiveness, development

1. Characteristics of multimodal transport

Transport plays a very significant role in movement of goods. The amount of cargo being carried is gradually growing from year to year, which results from intensive global trade exchange and dynamic development of logistics. That is the reason why carriers are constantly searching for new and more effective cost solutions within the area of transport [1]. One of such solutions is multimodal transport, which is said to be the form of sustainable transport.

Multimodal transport was first mentioned in the late 1980s. This is when in the global literature on the subject a new term *intermodal transport* started to be used in relation to carriage of goods. That kind of transport was mainly performed in the USA. In Europe, however, the term used at the time was *multimodal transport*. At present in the literature these two terms are used interchangeably although there appears to be a certain difference between them [2]. Multimodal transport stands for carriage of goods between the place of dispatch and the place of delivery by using at least two means of transport while intermodal transport actually refers to carriage of goods by at least two modes of transport, but this transport uses the same load unit and transported goods are not reloaded as such. For this reason intermodal transport can be seen as a type of multimodal transport [3]. According to UNCTAD, i.e. United Nations Conference on Trade and Development, international transport means the carriage of goods by at least two different modes of transport on the basis of a multimodal transport contract. This kind of transportation begins in one place in

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one country where goods are taken in charge by a multimodal transport operator to a place designated for delivery situated in a different country. The responsibility for and all arrangements related to the transportation process belong solely to one carrier [2].

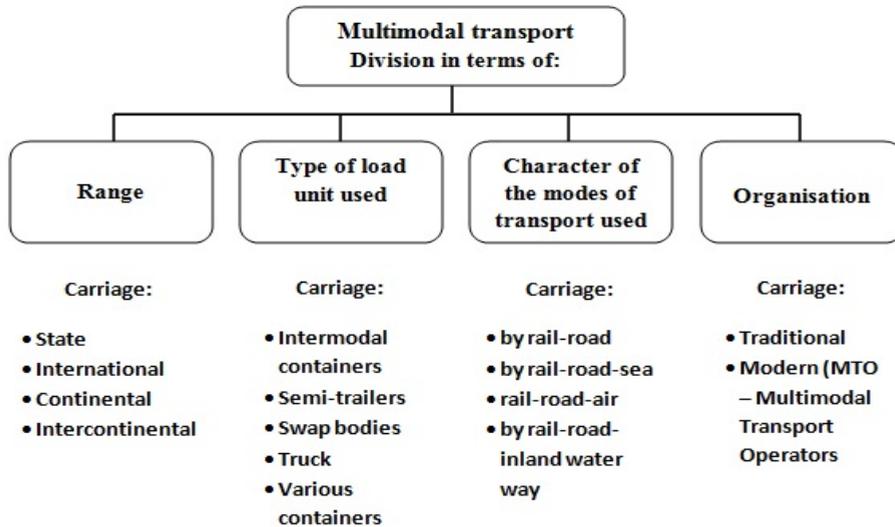


Figure 1. Multimodal transport division [4]

Load unit which is most frequently used in multimodal transport is intermodal container [5]. Its widespread popularity and wide range of use have resulted from such factors as capacity and structure features, size standardization on a global scale and profits for ship owners and harbors. Moreover, containers provide a possibility of consolidating package cargo (LCL) into bigger loads (FCL), which adds to reduction of time and cost connected with transportation [6].

2. Overview of polish multimodal transport

The development of logistics in Poland over the last few decades has resulted in a growing significance of particular modes of transport used for the carriage of various cargo [7]. Convenient geographical location, social and economic development of the country as well as intensive development of cooperation between the EU member states have facilitated multimodal transport development in Poland [8].

A growing interest in this branch of transport in Poland mainly involves a greater amount of cargo transported by road in the form of containerized transport [9].

According to the data published by the Central Statistical Office of Poland most containerized transport in Poland is by road (64,4%), followed by rail (35,6%). In 2012 the load in this kind of transport totaled 22,087,000 tons.

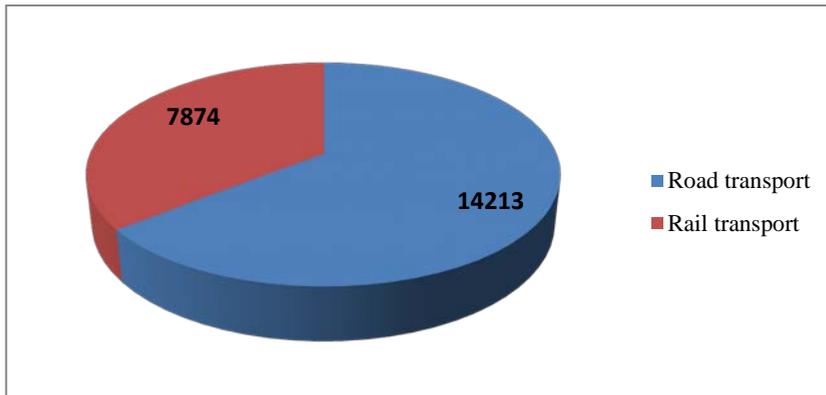


Figure 2. Carriage of cargo in containers by using two modes of transport in 2012 (in thousands of tonnes)[10]

The statistical data also shows that containerized transport from Poland abroad dominates in rail transport (72%). This is connected with multimodal transport on route Europe: West – East – West [7]. However, carriage of goods at home is mostly based on road transport.

The type of carried cargo is another aspect of multimodal transport. In 2013 carriage of 40-foot containers played the main part in this type of transport (ca. 57.1 %) while 30-foot containers dominated in import and export. A low share in the whole transportation was the share of swap bodies and semi-trailers (total of 9,304 units). However, it was trucks that came last in this category [11].

In 2013 on the Polish market the biggest rail carriers taking part in multimodal transport were the companies which belong to PKP (Polish State Railways): PKP Cargo S.A. and PKP LHS. The total share of those companies in the market in 2013 amounted to 57.72 % in terms of weight and 61.23 % in terms of transport performance [12].

In Poland there are several smaller companies which deal in multimodal transport. Such new establishments on the market might suggest a growing popularity of multimodal transport [13].

Table I.

Companies (which do not belong to PKP group) operating multimodal transport in Poland [12]

Company name	Year 2013 – in terms of transport performance	Year 2013 – in terms of tonnage
1. Lotos Kolej	14.83 %	15.06 %
2. (CTL Logistics i CTL Express)	6.85 %	6.46 %
3.DB Schenker Rail Polska	14.01 %	17.85 %
4. STK Wrocław	1.35 %	1.37 %
5. Rail Polska	1.13 %	0.94 %
6. Ecco Rail	0.51 %	0.56 %

The data shows that the most significant shares in the Polish market (among the companies which do not belong to the PKP group] belong to Lotos Kolej and DB Schenker Rail Polska. The good results achieved by the first company mentioned have resulted from provision of carriage for a big logistic operator - PCC Intermodal. It is worth noticing that Rail Polska and Ecco Rail are the rail carriers that started their operation as late as 2012 and 2013, and that is the reason why their market share is the lowest [7].

Development of multimodal transport has also resulted in new transshipment terminals being built. However, despite the fact that their overall number has increased over the last decade, it is still rather low in comparison to the average number in other European countries [7].

Table II.

Number of terminals in selected countries in 2012 [12]

Country	Number of terminals
1. Germany	146
2.The Netherlands	50
3.Italy	46
4.Poland	26
5.Belgium	22
6.Sweden	12

In 2012 in Poland there were 26 operational container terminals. This number places Poland in the position right after Germany, the Netherlands and Italy although the average density of terminals in Poland (0.8 terminal/10,000 km²) does not dramatically depart from the average European standard being 0.9/10,000 km². In 2012 as many as 21 out of 26 operating container terminals were rail-road terminals. The other five are located in Gdańsk (2 terminals), Gdynia (2 terminals) and in Szczecin (1 container terminal) [13]. The Deepwater Container Terminal (DCT) provides services for the world's biggest container ships and its throughput capacity amounts to 1 mln TEUs/year [13].

3. Opportunities for and barriers to multimodal transport development in Poland

Despite conducive conditions multimodal transport development is still quite limited and experiences many barriers of infrastructural, organizational and legal as well as economic character.

The main limitations are connected with rather poor condition of transport infrastructure, especially rail infrastructure which multimodal transport in Poland is actually based on. Outdated rolling stock and tractions, continuously on-going repair works as well as too low speed of transportation have a significant influence on the diminishing marketability of and interest in this particular mode of transport.

Another barrier includes too few logistic centres and transshipment terminals in relation to the actual needs of the market. Those limitations also result from the necessity to reload the cargo carried and obligations of complicated transport documentation.

Sea transport limitations mainly comprise such factors as poor accessibility of sea ports from the mainland and poorly developed road and rail network on their premises. As far as organizational and legal barriers are concerned, these are mostly border control procedures when crossing borders, as they are much stricter than in the case of crossing borders on mainland [14].

Another serious barrier is the strong position of road transport, which is used to carry a vast amount of freight. The economic factor underlying this problem becomes obvious as this mode of transport has lower transport fees and other payments for using the infrastructure [15]. Moreover, there is no need to incur further costs connected with reloading cargo.

The state and the European Union alike could offer an opportunity to develop and popularize multimodal transport by providing appropriate legal, economic and financial conditions. Here the main factors conducive to such development and increasing popularity of multimodal transport are transport policy laid down in the White Paper 2011 and the State Transport Policy for the years of 2006-2025, which assume an increasing significance of multimodal transport in trade exchange in the oncoming years and support all activities aiming at it [7]. The on-going as well as planned programs which are meant to provide funding and support for enterprises also provide suitable opportunities for development. Another factor which is a necessity in terms of popularizing multimodal transport is connected with building new transshipment terminals to be located not only in the vicinity of more significant cities or industrial areas, but also in less privileged regions of the country.

Yet another opportunity for the growth of multimodal transport in Poland are measures taken in order to integrate and promote carriers operating various modes of transport. A positive factor would be to introduce uniform fees and tariffs which would favor multimodal carriage of goods. Such measures are certain to enhance popularity of Polish carriers on the international market [16].

4. Analysis of the effectiveness of multimodal transport in Poland

The developing Polish industry, resulting in the establishment of many service and production companies, has led to the appearance of a relatively cheaper, more efficient and reliable form of transportation. Therefore, more and more frequently Polish companies resort to multimodal transport [14].

The growing effectiveness of multimodal transport is achieved by the use of containers and swap bodies (to carry large loads), which generates savings in terms of time and transport cost [17].

Growing marketability of multimodal transport in Poland means a better condition of urban and rural roads. Currently, their condition leaves a lot to be desired, which causes delays, increased costs of vehicle repair and higher fuel consumption. The condition of public roads may, on the one hand, improve the efficiency of transport (shorter delivery times, better services), and on the other hand, impair the effectiveness – delays in delivery

caused by high levels of congestion, and shorter life of vehicle fleet due to poor road surface [7].

The infrastructure of multimodal transport in Poland performed by rail includes mainly the railway traction and the rolling stock. In terms of the railway market share in Europe Poland is in the lead. Our country has the second greatest number of railway carriers and accounts for 12.5% of the total railway market in the European Union (in terms of the transport services performed) [18]. However, the Polish market of multimodal transport services is the eighth largest in the European Union. To a certain extent this can be attributed to the obsolete traction and rolling stock, which causes constant delays, idle time and time consuming maintenance work. Therefore, the state authorities should take actions based on modernization and adaptation of the freight wagons to the extent and structure of demand, the use of modern information systems to monitor trains and shipping units, as well as modernization of railway lines focusing on freight destinations while taking into consideration the TSI TAF specifications. Multimodal shipments performed in Poland are in 80% by road transport and only in 20 % by rail transport [19].

The effectiveness of sea and river transport in Poland depends on the condition of the fleet used and the level of modernization of transshipment terminals. The condition of ships used in multimodal transport is reflected by their technical aspects, especially by the innovativeness of marine engines. Currently, Poland manufactures marine engines which during tests display 60% efficiency, and the use of modern technology could improve their performance even by up to 20%. Taking into consideration the cost of fuel consumption, it should be emphasized that due to decreasing the speed of ships on one route, the savings could amount up to 30%, which could lead to an increased interest in this mode of transport [20].

The transshipment terminals located in the greatest marine ports are well fitted for handling semi-trailers, swap bodies and containers. The ports in Świnoujście and Gdynia can additionally handle full tracks. The marine port terminals account for the largest shipping weight but the limited cargo handling and shipping capacity of Polish railways impede their further development. Despite this fact the container traffic volume in the marine ports has been growing regularly for several years. This is due to large investment outlays on the cargo handling equipment, stacking yards, warehouses and seacoast development, as well as the implementation of modern information systems [21]. These modern information systems are very helpful in creating and improving transport processes. They also allow to run any transport process smoothly and to minimize problems [22, 23].

Poland has a chance to develop and improve the effectiveness of multimodal transport if appropriate funds are allocated by the state and by the European Union to the modernization and construction of a greater number of properly equipped transshipment terminals and improvement of the rail and road infrastructure [7].

5. Summary

Multimodal transport, which is a relatively new type of transport, is enjoying an increasingly significant role on the Polish transportation market. Undoubtedly, this situation has resulted from considerable developments in logistics, an increase in trade exchange as well as the situation in which business enterprises search for cheaper, cost and time effective and environmentally friendly carriage of cargo. Unfortunately, in spite of a great

many advantages of multimodal transport, at present, in Poland there are many barriers significantly hindering its development. This is mainly due to rather poor condition of linear transport infrastructure and hubs, especially rail transport, which multimodal transport in Poland is based on. This is the main reason, while still taking into account the other possible reasons presented in this paper, why road transport is still the dominating form of transport in Poland.

While evaluating the effectiveness of multimodal transport in Poland for the purpose of this paper the following were accounted for: geographical location of the country, the condition of the linear infrastructure and the hubs as well as the amount of the freight carried in a year. Having an undoubtedly great transportation potential, Poland is not able to make full use of it, which shows in rather poor effectiveness of the multimodal transport. In terms of multimodal transport by rail Poland came eighth among other European countries in the year 2012. Over several years multimodal carriage in the rail transport decreased to the advantage of the road transport. Such situation has possibly resulted from the bad condition of rail traction causing delays in deliveries as well as obsolete rolling stock which discourages entrepreneurs from using this particular mode of transport.

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