

RAILWAYS IN INTERMODAL TRANSPORT IN POLAND

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Abstract The dynamic development of car transport caused that there are more and more nuisance problems associated with this mode of transport and therefore the ways for solving them are in demand in Poland. Transport system which links the various branches of transport, creating a coherent transport chains is rail and intermodal transport. Supporting the growing importance of rail and intermodal transport is primarily aimed at reducing transport costs by improving its organization and using the most effective means of transport at each stage. Moreover, on the one hand, the basic advantages of intermodality are associated with the use of the most effective modes of transport, and on the other hand, intermodality requires the standardization of products carriage in the form of railway transshipment terminals. As a result, intermodal transport facilitates the management of supply chains, generating significant positive external effects, such as reducing the reliance on the most environmentally harmful road transport or reducing time and handling costs.

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1. INTRODUCTION

In today's economy, aiming at globalization, there are a huge variety of links in the sphere of raw materials, goods and services flow. Proper development of individual branches ensures efficient transport and information system. In recent years one can notice a significant increase of interest in logistics as the field of extremely intense grow, both in the countries of the European Community and in Poland. This is due to the emergence of new, technologically advanced distribution processes of goods, in which logistics plays a dominant role. Integrated supply chains, which are an integral part of logistics processes, makes the goods are moved from sender to receiver efficiently, quickly and with maximum cost savings. All this should be one total network, which requires a collaboration and cooperation of all units involved, regardless of the number of units engaged in organizing the supply chain. The system should be considered as a whole, according to co-operating to achieve the objective, assuming that the correct functioning of its parts is and will be preserved. Transport network should be a complex, parts of which contribute to the success of the whole. Our country, due to its location, has the opportunity to develop services within the sector of transportation, shipment and logistics, but to make this possible, well prepared linear and point infrastructure is needed. Unfortunately, the condition of roads and railway lines is far from the expectations of customers. It means that very important reason that causes and is likely to cause even greater restriction on movement in our country is poor land infrastructure, of inadequate standards, both linear (a network of railway lines, roads) and point one (terminals of various sizes and destination).

The priorities of the State transport policy should include activities aimed at promoting intermodal systems and the development of intermodal transport operators and logistic operators. The development of intermodal transport requires improving the quality of services, reducing the operating costs and ensuring high security for shipments. It also becomes necessary to make amendments to regulations, to introduce tax incentives and to provide support for projects contributing to the growth of intermodal transport. Establishing of a long-term plan for the construction of open logistics centers and container terminals is also essential (Antoniewicz and Zielaskiewicz, 2008, p. 70).

2. INTERMODAL TRANSPORT PROS AND CONS

Progress in the area of the construction and modernization of Polish roads one can see every day in the mass media. Much less interest is connected with the state of our railway infrastructure. Events such as the onerous problems with the regularity of movement of passenger trains as a result of adverse weather conditions during the winter or not logical organized schedule changes for some time focus pub-

lic attention on issues of this branch of transport. After some time the interest is decreasing and remains in the shadow of road transport issues. Surely this is not correct, because rail transport has lots of advantages. It is the most efficient land transport system for mass transportation, its impact on our environment is much less than truck transport, is cheaper – the costs of infrastructure building and operating are smaller in one ton of cargo transported, it is also more safety. There are much more advantages which may be mentioned, but this type of transport has disadvantages as well, such as low flexibility, high costs of forming the trains, especially in distribution transport, or tractability to failure carriage from one train to another, especially on single-track lines. The dynamic development of car transport caused that there are more and more nuisance problems associated with this mode of transport and therefore the ways for solving them are in demand. Transport system which links the various branches of transport, creating a coherent transport chains is intermodal transport (Kwaśniowski, Nowakowski and Zajac, 2004).

Among the barriers to the development of intermodal transport using rail transport, Polish intermodal transport practitioners mention primarily the following (Antoniewicz and Zielaskiewicz, 2008, pp. 69-70):

- "lack of state support for the development of intermodal transport, lack of generally available open container terminals,
- difficulties in the use of the railway terminals located in ports, as a result of which 86% of the container haulages is effected by motor transport,
- lack of updates of international agreements on cross-border traffic, particularly in the East,
- low international activity of Polish companies and branch organizations in the aspect of promotion of Polish inter-modal transport."

The above mentioned barriers to the development of intermodal haulages are very serious, nevertheless Poland has an exceptionally favourable climate for development. Assuring this to be the case, however, involves a change in state policy and the need of introducing regulations conducive to the development of this branch of transport.

The correct and comprehensive development of alternative forms of transport in Poland, which is undoubtedly the intermodal transport, is not possible without the development of a national network of logistics centers (Skowron-Grabowska, 2010, pp. 7-25). This results from the fact that these facilities, being located at the intersections of the main transport corridors, facilitate combining different transport modes and provide right conditions for the handling of goods. In addition, the existing concepts on the location of logistics centers indicate that they should be located in regions generating potentially large cargo flows, both in domestic and international transport (Kadłubek, 2011).

For the construction of a container terminal to be economically viable, a certain potential of unified cargoes will be required in the form of cargo containers, swap bodies and semi-trailers. Examples of Western European countries show that container terminals are being built within the complex logistics center construction

projects, where users and their customers create the required potential for cargo handling services. There is also a reverse mechanism, namely, the presence of a container terminal logistics center attracts users interested in rail transport to that logistics center (Mindur, 2008, p. 431).

About the advantages of the transport of goods in one package, which is the container or swap body or semi-trailer, on all the way of the transport course is written lots of, but it also has disadvantages. One of them is the high cost of container terminals construction and the requirement of efficient linear infrastructure, of appropriate technical parameters. Railway lines for intermodal transport has been specified in the European Agreement on Important International Combined Transport Lines and Related Installations (AGTC) on important international combined transport lines and associated facilities. The Annexes to this Agreement identify (Umowa europejska o ważnych międzynarodowych liniach transportu kombinowanego i obiektach towarzyszących (AGTC), 2004):

- Railway lines important for international combined transport;
- Objects important for international combined transport, which are specified for 28 European countries and divided into:
 - a) Intermodal terminals,
 - b) Border crossings,
 - c) Change the gauge stations,
 - d) Ferry links / ports included in the international combined transport networks;
 - The technical characteristics of networks of important international combined transport lines;
 - The performance of trains and the minimum requirements for infrastructure, which specify:
 - a) Requirements concerning the effectiveness of services,
 - b) Operational characteristics of trains,
 - c) Minimum requirements for railways,
 - d) Minimum requirements for terminals,
 - e) Minimum requirements for the intermediate stations.

This agreement was signed in Geneva on the 1-st of February 1991 and it was ratified with changes on 22-nd of January 2004. The agreement defines the technical conditions, with which should correspond the lines and terminals for intermodal transport. The parameters are specified in the spheres of trains length (600 m), split axle (22.5 tons) and cruising speed (100 km / h), as well as parameters fields which ratifying countries should tend while new infrastructure building, i.e. the length of track which allows to use the trains with a length of admission of 700 m and the speed of train ride of 120 km / h. The agreement states also time and quality service standards of intermodal units, which transfers into technical and organizational requirements in relation to the lines, terminals and stations. The current technical condition of the lines departs significantly from commitments and declarations in the area of achieving the appropriate technical parameters. The state of linear infrastructure for many years underwent a systematic deterioration

due to insufficient funds targeted to its repair. Overall assessment of the technical condition of Polish railway track shows the Fig. 1.



Fig. 1 Technical state of Polish railway lines in 2009 (www.pkp.pl)

In assessing the technical condition of the track, PKP S.A. (Polish State Railways Joint-Stock Company) adopt the following evaluation criteria (www.pkp.pl):

1. Good - lines in operation with established operating parameters, requiring only works maintenance.
2. Satisfactory - lines in operation with reduced operational parameters (reduced scheduled speed, introduction of point speed limits), requiring not only maintenance works in order to keep the operational performance and running repairs involving the replacement of the defective parts of the track.
3. Unsatisfactory - lines operated at significantly reduced operating parameters (low scheduled speed, significant speed reductions, reduced allowable pressures), eligible for the comprehensive track structure replacement.

Above mentioned criteria submit to the quality of the trains run (also for the transport of intermodal units), including their low regularity, keeping the scheduled time of the run or the possibility of riding too slowly in relation to the expectations.

It is therefore important to know that without a network of modern container terminals and logistics centers, or modern logistic bases (i.e. the point bases of handling work and logistics services concentration) no strong development of carriages will be achieved. Exceptionally, in the combined carriage segment, it is advisable to use the principles of State interventionism, which states that if the objective for the development of combined transport is to create favourable technical, organizational and economic conditions, then this cannot be achieved without the State assistance. In this case, it is clearly argued that State interventionism should manifest itself in the creation of a specific plan for development of intermodal transport with indication of appropriate support sources (Antoniewicz and Zielaskiewicz, 2008, p. 70).

3. IMPORTANT PARAMETERS

In our country there are about 26 intermodal terminals operating, unfortunately, the technical parameters of most of them deviate from the preferred standards. Even in the case of new investments, bearing in mind that they are expensive and the payback period is long, investors reduce their size to the minimum one in relation to the predicted cargo flows (Gemra, 2009). Significant impact on such relation has the high sensitivity of the rail transport on the economic and political conditions. Investment savings are achieved by shortening the length of loading and unloading tracks, reducing storage yards areas or reducing the number and type of handling equipment. For example, the newly built terminal in Sławkow, funded with support from EU funds, had a loading and unloading front of length of approximately 400 meters (due to the length of the crane yards and tooting). Currently its development is planned. The newly constructed track in the modernized terminal in Malaszewicze on our eastern border has length of about 480 meters. Not maintained recommendations entered in the AGTC agreement is essential for the costs of intermodal units, and ultimately affects the amount of the freight. The consequence of failure to comply with certain technical parameters of linear and point infrastructure may be losing the customers in the competition with the road transport. It should be noted that the analysis of the competitiveness of transport modes show a clear dominance of road transport in national freightage, while in international freightage, due to long distances and thus a lower price rate per kilometer, rail transport is more competitive. Not without significance in this case is the quantity of the cargo flow. Although the state of linear infrastructure in Poland, the price of its accessing is not relevant to its quality. State policy in this area makes the customers are encouraged to road transport use. The prices of freight in intermodal transport are directly affected by the rates of access to railway infrastructure and electricity costs. By 2009 intermodal transport was comprised by the support in this area, for which access rates were almost three times cheaper than for standard freight trains. These actions came out to meet the expectations and policies of the European Union authorities, who treated this type of transport with special care as eco-friendly and future-oriented form of transport (Zielaskiewicz, 2011, pp. 32-22).

Examples of European Union countries show that intermodal transport should be promoted until the conditions of competition between motor and rail transports have been equalized. In Poland, long-term plans for the development of intermodal transport have been included in four strategic development documents:

- "The National Development Plan for the years 2004 - 2006,
- The National Development Strategy for 2007 - 2015,
- The National Strategic Reference Framework for 2007 - 2013, and
- The National Transport Policy for 2006 - 2025. "

All the above documents lay the emphasis on the need to stimulate and ensure adequate resources for the development of modern intermodal transport in Poland. At the same time, despite a lot of weight being attached to intermodal transport in key policy and sector documents, there is no overall strategy for its development.

The Polish government plans to spend 258 million EUR in the years 2007 - 2013 under the Infrastructure and Environment Operational Program (of which 112 million EUR will come from the Structural Funds) and approximately 65 million EUR from the Regional Operational Programs for the development of intermodal transport, and the earmarked resources should largely enable the development of intermodal transport strategy. In addition, the programs which should play a fundamental role in the development of the Polish system of intermodal transport include: SPOT (*Sectoral Operational Program Transport*) Program for 2004 - 2006 and the POLiS (*Infrastructure and Environment Operational Program*) for 2007 - 2013.

Unfavourable situation for the intermodal transport development in our country is from the 1st of January 2010, when the rate of access for intermodal freight have been drastically increased. Fitting to the compensation of part of the cost by the state for customers using intermodal transport by using the refund mechanism of the part freight costs for the third parties and shippers arranging those freight services are still remaining in the sphere of mediations and finally many customers resigned rail transport and is resigning in turn to road transport, and the ecological consequences of this move will pay the whole of society for. Promotion of intermodal transport based on rail should be in the interest of many of us. The carriage of intermodal units takes place (except the short distances of the railroad access to terminals) on electrified lines, indicating the ecological character of the freight. In Poland more than 60% of the line is electrified. According to the findings of Polish State Railways Joint-Stock Company entered in the regulations of access to routes, the unit rates of the basic fee for access to railway infrastructure [Polish Zloty / km] depend on the weight of the train and the railway line category. Trains carrying containers usually have a total weight of about 1200 tons. Taking into the consideration the weight, for 2011 there was determined for the railway lines which are available for traction network device, the unit rate for weight of the train increasing 600 tons and smaller than or equal to 1100 tons, which is 7.33 Polish Zloty / km for the line of the "1" category and 19.19 Polish Zloty / km railway line for the line of the "5" category. If the weight of the train is increasing 1100 tons, and is smaller than or equal to 1500 tons, the unit rate is 11.75 Polish Zloty / km for the categories of the "1" line and 24.63 Polish Zloty / km railway line for the "5" category (Table 1). The railway line category is a parameter set for the pricing needs, taking into account average railway traffic density, permissible technical speed and constant speed reductions. These conditions are very unfavourable for the carriers and will certainly affect the size of intermodal transport (Zielaskiewicz, 2011, p. 33).

Table 1 Average unit rates and average rates of basic network for access to railway infrastructure of Polish State Railways Joint-Stock Company in 2000-2010 (www.utk.gov.pl)

Unit rate in Polish Zloty/km	Years										
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Passenger trains	8.35	9.05	9.57	8.97	9.14	8.95	6.75	6.15	6.14	6.45	7.02
Goods trains	21.52	21.71	23.96	23.55	24.00	23.50	17.78	16.04	18.76	19.55	17.42
Intermodal trains	21.52	21.71	23.96	23,55	24.00	10.59	10.59	6.63	4.92	5.57	17.42
Average network	11.76	12.27	13.28	12.57	12.81	11.98	10.66	10.58	10.06	10.56	10.93

Supporting the growing importance of intermodal transport is primarily aimed at reducing transport costs by improving its organization and using the most effective means of transport at each stage. Moreover, on the one hand, the basic advantages of intermodality are associated with the use of the most effective modes of transport, and on the other hand, intermodality requires the standardization of products carriage in the form of railway transshipment terminals. As a result, intermodal transport facilitates the management of supply chains, generating significant positive external effects, such as reducing the reliance on the most environmentally harmful road transport or reducing time and handling costs.

4. CONCLUSIONS

Intermodal transport in Poland still has considerable untapped potential. The main problem for its development, is too low quality of the transport infrastructure, especially the railway, which constitutes the basis for the efficiency and competitiveness of intermodal transport. Also no less important prerequisite is the availability of infrastructure, including transshipment facilities. The increasing volume of container reloading at seaports and the increase in the size of newly-built container ships point out to the fact that LCL cargo haulage between the port and the sender or the recipient inside the country must become increasingly efficient. Otherwise, reloaders and storage areas at marine container terminals will become a bottleneck for intermodal transport. Therefore, a growing stream of containers cannot be handled solely by motor transport, and containers at seaports should be taken over primarily by rail and inland waterway transports (Kot and Marczyk, 2010, pp. 189-207). However, an efficient infrastructure in the form of railways and terminals located in the hinterland is required for this purpose (Mindur, 2008, p. 431).

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BIOGRAPHICAL NOTES

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