

PERSPECTIVES AND PROBLEMS OF INTERMODAL FREIGHT TRANSPORTATION MARKET DEVELOPMENT IN POLAND

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Abstract

The intermodal transport segment is a transport market of enormous opportunities. Fast economic development and the related change in transport needs influences the dynamic increase of demand for transport services in combined system, including the use of rail transportation. The transit geographic situation of our country as the eastern European Union border and situation of Polish sea harbours on the north south in the Eastern European Transport Corridor are additional assets. Despite many assets and growth dynamics of the intermodal transport, their share in general transport volume has still been marginal. The intermodal transport segment in Poland requires sustainable development by means of investment outlays as well, e.g. in container terminal, logistic centres and rolling stock, and furthermore efficient support schemes of at least over a decade horizon. Operation of relevant quality line infrastructure of rail transport and nodal infrastructure indispensable for units handling at the junction of road and rail transport makes up a condition for the intermodal transport development. From the cargo rail transport point of view, provision of relevant rail corridors capacity and ensuring satisfactory speed of freight trains are most important.

Keywords: *intermodal transport, line infrastructure, node infrastructure, capacity*

1. Intermodal transport share in rail freight

Intermodal transport in Poland present minor share in the rail freight despite the fact that since 2010 a significant increase in that type of transport has been observed (Tab. 1). In the first three quarters of 2012, it amounted to 43.4% by loads mass and 31.4% by transport performance. After the third quarter of 2012, the intermodal transport share in rail freight was 6.16% by transport performance and 3.37% by the transported goods mass. In Spain, the Netherlands, Belgium and Italy, the share in intermodal transport was over 30%. According to the GUS (Central Statistical Office) data, the intermodal transport market in Poland is based on sea-road carriages with their above 80% share in the intermodal market. The share of rail transport in intermodal transport is unstable and after its drop in 2009, increased to the level of 16.6% in 2010. In sea harbours on the other hand, 56% more loads were handled in 2010 than in 2009. [1]

The rail intermodal transport is significantly dominated by container transportation that in 2011 presented a total 97.8% share in transport by the transport performance. 2.2% share was of swap bodies, 0.02% of semi-trailers and trailers and 0.001% of trucks (Tab. 2) [2].

2. Structure of road-rail intermodal transport system

The system of intermodal transport involves [3]:

- transport organizers and carriers,
- infrastructure suppliers.

Tab. 1. Intermodal transport share in total rail freight

	Counted by freight performance [tkm]	Counted by freight mass [t]
2003	1.71%	0.94%
2004	1.87%	0.80%
2005	1.71%	0.81%
2006	2.53%	1.18%
2007	3.01%	1.39%
2008	4.29%	1.73%
2009	3.32%	1.36%
2010	3.87%	1.87%
2011	4.53%	2.37%
2012	6.16%*	3.37%*

*average for 3 quarters of 2012

Source: Report - Functioning of rail transport market in 2011, Railway Transport Office, September 2012 [2]

Tab. 2. Transport unit share in intermodal transport

Year		Containers	Tractors with semi-trailers	Semi-trailers and trailers	Swap-bodies
2003	Mass	89.591%	0.836%	0.120%	9.453%
	transport performance	96.763%	0.846%	0.042%	2.349%
2005	Mass	94.246%	0.493%	0.133%	5.128%
	transport performance	98.002%	0.505%	0.056%	1.457%
2007	Mass	97.818%	0.001%	0.000%	2.182%
	transport performance	96.761%	0.001%	0.000%	1.239%
2009	Mass	96.376%	0.000%	0.001%	3.622%
	transport performance	97.099%	0.001%	0.001%	2.900%
2011	Mass	97.254%	0.000%	0.040%	2.727%
	transport performance	97.808%	0.001%	0.023%	2.167%

Source: Report: Functioning of rail transport market in 2011, Railway Transport Office, September 2012 [2]

The transport organizer responsibility is to care for the transport service quality on the whole supply route.

In the road-rail transport the transport organizers may be:

- transportation companies who specialize in rail transport and have their own rolling stock,
- forwarding companies exclusively dealing with transport organization that do not own their rolling stock,
- transportation companies who specialize in road transport and have their own fleet

3. Strengths of intermodal transport

The major strengths and advantages of the modal transport application in freight are as follows [4]:

- reduction of transport external costs,
- perception of the intermodal transport as the most environment-friendly,
- using the best features of various means of transport in the transportation process (door-to-door),
- high security level in hazard cargo transportation,
- occurrence of forwarding and logistic companies to streamline the transportation process,
- application of means of road transport as a loading unit,
- low requirements in terminal equipment.

Decrease in the use of road transport and carriages transfer to rail will greatly affect decrease of

cargo transportation negative impact on the environment. The road transport dominant in the cargo carriages structure, generates the most environmental harmful influences. When the impact effects are expressed in money as costs borne by the society in reference to the environment degradation, the cost generated by vehicle transport will amount to 10.77 euro/1000 tkm. The cost generated by rail transport is 39% lower and amounts to 7.75 euro. However, the difference between the road and inland waterway transport is 3590% and short sea shipping 5385%.

Tab. 5. Costs generated by factors negatively influencing the environment in various modes of transport

[euro/1000 tkm]	Vehicle transport	Rail transport	Inland waterways	Short sea shipping
Noise level	2.138	3.45	0	0
Pollution	7.85	3.8	3	2
Emission	0.79	0.5	insignificant	insignificant
Total	10.77	7.75	about 3	about 2

Source: European Commission, Commission calculation of the external cost savings according to Article 5 (3) of the draft Regulation, 2002 [5]

In Poland, costs of the transport destructive impact on the environment relatively make up about 29% external costs counted by the European methodology, including:

- air pollution costs 11%,
- climate changes costs 5%,
- noise costs 11%,
- other environmental costs 2%.

The remaining 71% external costs are human and material effects of transport accidents. External costs make up a significant sum of expenses that are not included in the accounting process of transportation entities, since they reach the equivalent of 6% GDP. Moving cargoes from road to rail transport results in road traffic flow reduction, which is a direct cause of congestion decrease in some transport junctions and in consequence of decrease in accidents number and road safety increase. Use of the intermodal transport facilitates 60-90% reduction of accidents in urban areas and above 55-80% outside the built-up areas depending on the length of rail transport section.

4. Prospects of intermodal transport development in Poland and Europe

In 2011, licensed railway undertakings launched approximately 1250 intermodal routes per month. 65% was container transport in international transportation service. The highest share of routes in land connections was in transport between Poland and Germany i.e. 280 routes and Slovakia: 136. It should be noted that the intermodal transport share in the rail market has still been minor. Container transport generates approximately 6% operational work performed on the network of the general manager of PKP PLK S.A. infrastructure. Railway undertakings plan the development of container network. In 2012, approx. fifty new routes per week were launched, including nearly 30 in domestic connections. In 2011, seven licensed railway undertakings provided intermodal transportation services, including two companies of PKP group: PKP Cargo, PKP LHS and Lotos Kolej, DB Schenker Rail Polska, CTL Express, CTL Logistics and STK Wroclaw. It should also be mentioned that since 2007 the number of carriers providing the intermodal transport changes significantly which implies lack of interest in entering the market by new carriers who mainly focus on the bulk goods transport e.g. hard coal or aggregates. Due to the intermodal transport development, the perspective of global markets development increases. In the case of Poland, it provides an opportunity to strengthen the country position as a link between Western and Eastern Europe and Russia. From the customers of transport services point of view, combined long distances transport may give rise to significant savings. However, the most important economic benefits are generated by the intermodal transport on macroeconomic level, in a broad socio-economic sense. The said benefits are expressed in savings related to decreased external costs and costs of infrastructure creating [6].

5. Problems of intermodal goods transport development

The following general factors diminish the intermodal transport competitive advantage [7]:

- companies long-term practice to use road transportation services,
- a necessity to change the means of transport and thus the transport network that make the transport process longer,
- change of the means of transport and transshipment of transport unit generates the error risk or unit damage in the loading process thus while using one transport mode, the carriages are usually planned so as to avoid transfers,
- moderate access fees to railway infrastructure,
- lack of wagons, container carriage, semi-trailers and tractors,
- low quality of railway line parameters, including average commercial speed up to 35 km/h,
- lack of local authorities and state administration support in the development of logistic centres operating in the intermodal transport system of terminals and logistics centres.

The means of transport change and transport unit transshipment make up characteristic features of intermodal transport, which cannot be eliminated. However, the number of transfers can be limited if the unit is loaded directly in the place of cargo collection and unloaded in the destination place.

Summary

Notwithstanding the weaknesses and existing threats, the share of intermodal transport has been lately dynamically increasing in Poland and the tendency should still continue. The intermodal transport share in total transport services exemplifies high increase potential, though currently amounts to 1.2%. The average level of EU countries in the year 2000 was 5-8% share in total transport (i.e. from 10-30% rail carriages, 17% on average). Reaching a 5-8% level in Poland is to be implemented in the 2025 perspective. In the prospect of the next ten years, the intermodal transport counted by the transport performance should increase by minimum 36% and in the optimistic assumption even by 50%, assuming the GDP increase of approx. 45%. Nevertheless, in the 2030 perspective, the intermodal transport cargo carriage dynamics increase should amount to minimum 106% and even 136% considering an optimistic assumption. These factors are significantly higher especially if compared to the prospects of increase in the cargo railway transport. In the case of railway transport, the transports are to increase from 14% to 16% until 2020 and from 37% to 42% in the 2030 perspective.

References

- [1] Zielaskiewicz, H., *Transshipment terminals in Poland. Technical and design problems – part 1*, Transport Infrastructure, 4, 2012.
- [2] *Functioning of rail transport market in 2011*, Railway Transport Office, pp. 34-37, 2012.
- [3] Internal data of PKP Polskie Linie Kolejowe S.A., www.plk-sa.pl.
- [4] White Paper: European Transport Policy for 2010: Time to decide, COM (2001)370, 2001.
- [5] Handbook on estimation of external costs in the transport sector, Produced within the study Internalisation Measures and Policies for All external Cost of Transport (IMPACT), Version 1.1, CE Delft, 2008.
- [6] Zielaskiewicz, H., *Transshipment terminals in Poland. Technical and design problems – part 1*, Transport Infrastructure, 4, 2012.
- [7] Ballis, A., Golias, J., *Comparative evaluation of existing and innovative rail–road freight transport terminals*, Transportation Research Part A, No. 36, 2002.