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DOI: 10.35117/A\_ENG\_16\_06\_04

**Intermodal transport in Wielkopolska in the view of the stakeholders' survey**

**Abstract:** The paper attempts to characterize an intermodal transport in Wielkopolska, in particular in the context of market conditions for its development. The studies were conducted by an interview with open questions. The aim was to examine the possibility of development of intermodal transport by survey with stakeholders and customers. The study allowed us to identify certain regularity in terms of transport service operators expected by stakeholders. The most important are factors associated with long-term cooperation with reliable transport companies. The expansion of road system diminishes the competitive position of intermodal transport. Among the respondents dominates the desire to maintain the status quo rather passive attitude in shaping the model of transport. Only entities implementing the strategy of corporate social responsibility, where sustainability is incorporated into their objectives have contrary attitude. The development of this idea is a factor in a potential increase in the importance of intermodal transport.

**Keywords:** Intermodal transport; Road transport; Rail transport; Intermodal terminal

**Objectives and research methodology**

The purpose of this article is to highlight the current state of development of intermodal transport in the region of Wielkopolska, as well as an attempt to identify trends and prospects of its development, based on the completed surveys conducted among different groups of visitors in-depth interviews method. The premise of selection the topic is still a growing interest of the European Union the development of this mode of transport, so that by increasing the share of rail transport to achieve the objectives of the transport policy and the general economic environment [11] [12].

Domestic output of literature for the transport of intermodal is not too extensive. Most of the works are articles relating to: existing or proposed technical solutions, discussing regulations, strategic documents, commenting publicly available statistical data describing the context of intermodal transport logistics systems, or pointing to the potential benefits from the development of intermodal transport. These articles have a small effect on the area of Wielkopolska. Nevertheless, intermodal transport recognizes the development potential and opportunities for growth in many regions [6]. In foreign literature it is remarkable however elaboration T.A. Mathisen and T.-E. S. Hanssen [7] in which the authors made a detailed review of the literature and the current state of research in intermodal transport.

The study refers to the concept of inter-sector balance by improving logistics services in the railway area [3]. At the same time observations on the transport market shows low efficiency of operations, which is reflected in the dominant role of road transport, with no prospect of a sudden change the status quo [10].

Taking into account differences in mutual substitution and complementarity between the different branches of transport, the article raised primarily aspect of possibilities for substitution of road transport by rail, taking the leading role of maritime transport in the handling of economic turnover on a global scale. The omission of aviation transport is mainly due to methodological assumptions, because this type of transport is characterized by a natural necessity of the organization of the transport of the "last mile" and their use for the transport of high-value consignments of negligible mass. However inland waterway transport was omitted due to trace participation in transport in Poland, which was confirmed by respondents (none declared any use or interest in the area).

Completed studies are in large part the nature of primary research. This is a natural consequence of adopting the point of view of the user, so that the greatest possible extent reflect his perception of intermodal transport and on this basis to develop specific applications. The collection of primary data was performed using the method of CATI - research form contained mainly open-ended questions, however, the study was made possible mainly due to the institutional character of the respondents. Refusal to participate in the study were rare, while some respondents skip answers to some questions because of trade secret or explaining the lack of expertise (for entities strongly growing outsourcing transportation services). In some cases, interviews were carried out in the formula of a personal conversation.

The study should include a behavioral research as a key aspect is their perception of reality and basing on the opinions of a qualitative nature. Gathered during the interviews information was compiled from statistics. Quoted in the development of factual data are rooted in the official rankings of public institutions, i.e. The Ministry of Infrastructure and Development and the Office for Railway Transport.

### **Wielkopolska as an area of intermodal services development**

The key factor that predestine Wielkopolska region to the location of logistics activities in the field of intermodal transport is its location. Viewed from the western border of the country Poznan is the first major city in Poland, situated directly on the electrified railway line with good performance (class lines D3,  $V_{max} \geq 80$  km/h) [14]. Thus, the transport by rail for longer distances at the European level has in Wielkopolska by far the best conditions for growth, better than in other regions of the country.

A manifestation of the strong position of Wielkopolska in terms of the development of intermodal transport is also a high saturation of region of terminal infrastructure. In the light of the Railway Transport Office (map intermodal terminals of September) 2015 off all the regions, number of intermodal terminals in Wielkopolska is the largest, and in terms of

handling capacity Wielkopolska persists in principle only natural leader, i.e. Pomerania, where is extensive port infrastructure.

Taking the perspective of the needs in intermodal transport of balancing the distribution of key importance for the development of intermodal transport have three directions of investment, i.e.:

- investments in nodal infrastructure of intermodal transportation,
- investments in railways,
- investment in rolling stock intended for intermodal transport.

Both at national and regional level there is a significant advantage in the allocation for road transport, which impairs the competitive position of other forms of transport. Comparison of investment in roads and railways in the area of the two operational programs, supported by EU funds, are included in Table 1.

Table 1. Intermodal comparison of expenditures on investments supported with EU funds in the 2007-2013 period

	Transport drogowy*			Transport kolejowy**		
	Wartość	całkowita	Dofinansowanie	Wartość	całkowita	Dofinansowanie
	[mln €]		[mln €]	[mln €]	[%] ***	
<b>Szczebel krajowy</b>	13 811,4	100,0	11 570,6	6 096,3	4,4	4 877,1
<b>Szczebel regionalny – woj. wielkopolskie</b>	380,7	83,8	256,4	158,7	1,1	81,2

\* na poziomie krajowym uwzględniono jedynie wsparcie w ramach POIiŚ, drogi były także wspierane poprzez szereg innych działań (tereny wiejskie, rewitalizacja, programy transgraniczne i inne)

\*\* dla zapewnienia porównywalności danych w obu przypadkach włączono także nakłady na tabor kolejowy, choć w przypadku programu regionalnego był to wyłącznie tabor pasażerski

\*\*\* jako poziom odniesienia (100%) przyjęto nakłady na transport drogowy na szczeblu krajowym

source: own studies based on [13] and [15]

In natural way improving the competitive position of intermodal transportation is generated by investments Terminal. Such projects could be supported EU -it let to implement a number of projects; projects implemented in Wielkopolska included in Table 2.

The specificity of the rail transport scale causes, that in case of a rolling stock park cannot talk about his assignment to a specific region. Tabor fulfills its function in the whole area of the railway, which by progressive liberalization must be examined in the context of the whole of Europe. Despite this range adopted for the implementation of projects in the train intermodal transport, presented in Table 3 gives a picture of the phenomenon.

Table 2. Projects supported by the Cohesion Fund funds intended for the expansion of terminal infrastructure in Wielkopolska in 2007-2013.

Tytuł projektu	Podmiot realizujący	Wartość inwestycji [zł]	Dofinansowanie unijne [zł]
Budowa terminalu intermodalnego w Kórniku koło Poznania	HHLA Intermodal Polska sp. z o.o.	165 399 804,61	55 286 032,40
Budowa intermodalnego terminalu kontenerowego w miejscowości Jasin k. Poznania	Centrum Logistyczno Inwestycyjne	39 824 168,09	13 875 285,26

	Poznań II sp. z o.o.		
Budowa i wyposażenie kolejowego terminala intermodalnego na stacji Poznań Franowo – Etap IA	PKP CARGO SA	25 912 282,56	9 428 007,03
Razem:		231 136 255,30	78 589 324,69

source: Own calculations based on EU Grants Map - website of the Ministry of Infrastructure and Development <http://www.mapadotacji.gov.pl/> (access 24.09.2015)

Table 3. The development of the rolling stock park of intermodal transport based on the Cohesion Fund in 2007-2013

Tytuł projektu	Podmiot realizujący	Wartość inwestycji [zł]	Dofinansowanie unijne [zł]
Zakup nowych i używanych platform podkontenerowych (wagonów intermodalnych) do obsługi połączeń intermodalnych	POLZUG Intermodal Polska Sp. z o.o.	135 713 027,11	33 037 738,32
Zakup i dostawa nowobudowanych wagonów platform 80' do przewozu kontenerów	PKP CARGO SA	117 077 670,00	28 508 700,00
Zakup taboru intermodalnego dla Rail Polska Sp. z o.o.	Rail Polska Sp. z o.o.	51 257 366,86	12 501 796,80
Rozwój transportu intermodalnego w Pruszczu Gdańskim poprzez zakup naczep do przeładunku pionowego	Erontrans Sp. z o.o.	43 837 974,90	10 692 189,00
Zakup lokomotyw manewrowych do obsługi terminali intermodalnych	POLZUG Intermodal Polska Sp. z o.o.	38 266 900,00	9 321 000,00
Wzrost konkurencyjności przewozów intermodalnych poprzez zastosowanie wagonów do przewozu kontenerów ciężkich	Laude Smart International SA	34 838 151,00	6 905 010,00
Razem:		420 991 089,87	100 966 434,12

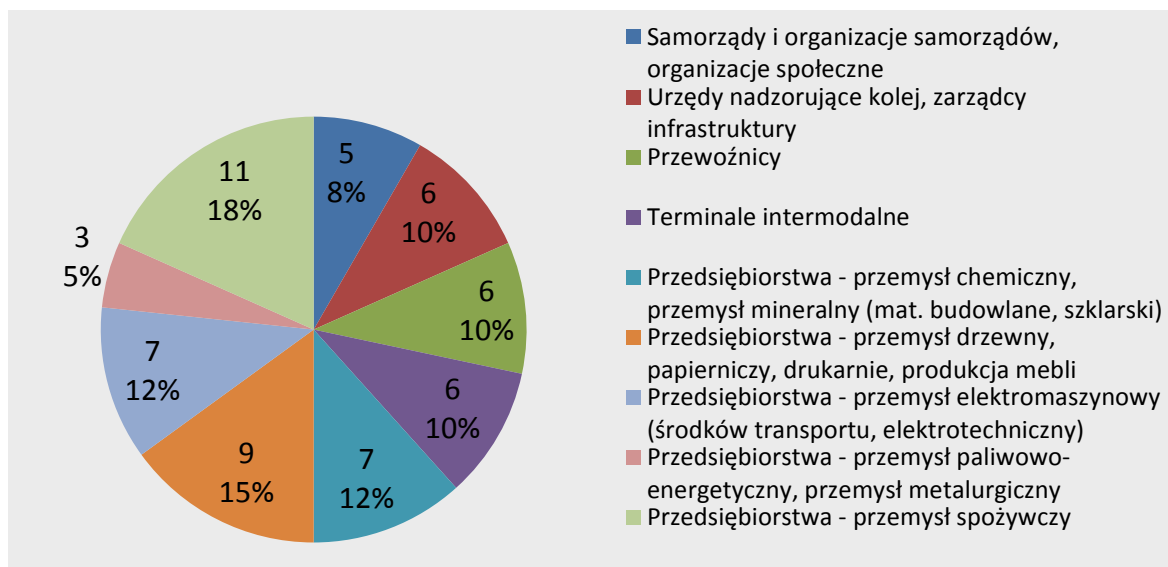
source: own calculations based on maps of the EU grant - the website of the Ministry of Infrastructure and Development <http://www.mapadotacji.gov.pl/> (access 24.09.2015)

To improve the competitiveness of intermodal transportation is needed, above all, to improve the parameters of railway lines, which will result in shortening the travel time of freight trains on medium and long distances, and to improve their capacity. Investment needs in this area are significant, especially in view of the large mass of container trains, and in the meantime the existing action largely focusing their attention on improving the conditions for the implementation of passenger connections.

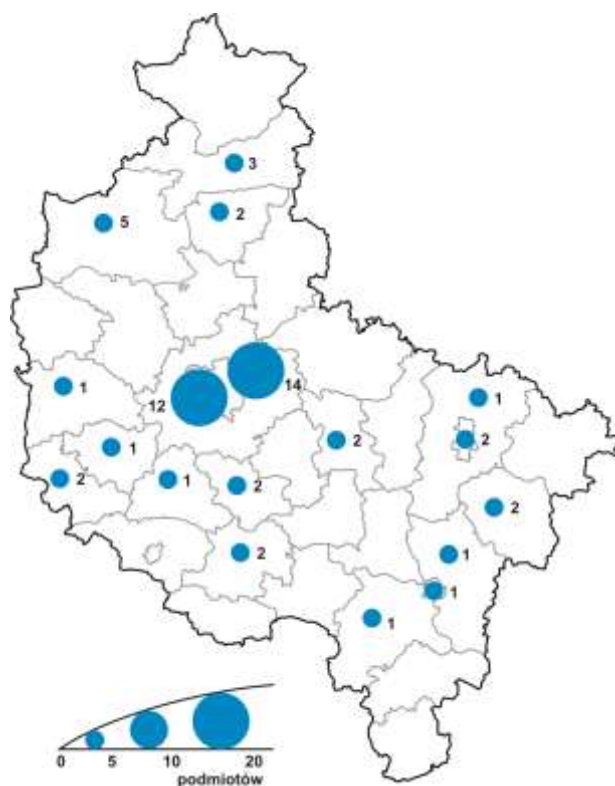
### Intermodal transport in the light of the interviews

The interviews were carried out essentially with two groups of subjects. On the one hand, discussions were conducted among the clients of the transport system, so as to identify their needs transport service. This approach is consistent with the principle of putting the customer first. On the other hand, interviews were also conducted with stakeholders of the transportation industry, including operators of intermodal terminals. Thanks to this approach

it was possible to know the internal conditions and barriers to the development of intermodal services, but also customer expectations clash with the capabilities and development plans suppliers. The structure of respondents and their spatial distribution within the Wielkopolska region is shown in the following figures 1 and 2. The sheet-depth interviews, depending on answering group containing from a few to several open questions, concerning, among others perception of transport policy in the field of intermodal transportation, changes in the industry in recent years, the choice of mode of transport and the factors determining the choice.



1. The structure of the respondents in the survey, *source: own*



2. Spatial distribution of the respondents in the Wielkopolska region Explanation: The figure does not show 3 entities established in the city of Warsaw and 1 entity with offices in: Lubuskie and Łódzkie counties, *source: own*

The collected opinions of transport users confirm the dominance of road transport services in the economic environment and the Wielkopolska region is not quite significantly deviating from the rest of the country. Among respondents using transport services can be distinguished above all the following groups:

- large entities, consciously shaping network of logistics, often using dedicated rail, recognized in fixed timetable,
- medium-sized entities ("typical"), operating at the regional or national, not necessarily aspire to the role of leaders in the market offer,
- innovative entities, implementing the strategy of corporate social responsibility (CSR - corporate social responsibility), for which it is hard to identify the specificity of industry (different industries).

This division - representing some contractual distinction under both the size of the company and the nature of answers - leads to the conclusion that the first group - large companies - was almost every third respondent. The second group - medium-sized companies accounted for more than half of the respondents.

The dominant solution for the transport service supply and distribution is to entrust this field the specialized entities, and among the two main criteria for selection of suppliers in this area are indicated: the price and long-term, good cooperation. In some cases, the outsourcing of transport services, the company was so much strong that it was difficult to find a person who would be able to give further information on the perception by the entity development prospects of intermodal transportation.

Among the entities that can be classified as a "typical" low knowledge of issues related to intermodal transport stemmed largely satisfied with the current situation, in which the entire external transport is satisfactorily supported by the transport. Moreover, among the barriers to development having its source in the sphere of transport, some companies exchanged a temporary shortage of specialized truck fleet, which necessitated the use of intermodal solutions. Excluding large entities whose scale of operations is determined by the use of railways for the transportation of materials, components and products because of a large decrease in the unit cost, also among some entities with smaller turnover occurred interest in intermodal services. This kind of attitude prevails among the entities that have as part of their business strategy to develop the concept of CSR. In this way they incorporate long-term effectiveness of the current social management decisions.

Among the obstacles of changes in distribution of interbranch cargo transport are also mentioned significant development of logistics services based exclusively on road transport. First of all, these are distribution centers and warehouse space, localized without access to the rail network, and with good road accessibility. Their development makes investments in intermodal distribution centers, using rail transport, including intermodal trains a fixed frequency, characterized by the unsatisfactory rate of return. The collected observations indicate thus a major difficulty in creating a multimodal transport chains long range with the use of rail transport. Barriers to the development of intermodal transportation inherent in him perceive the respondents from the transport sector. Particularly the problems associated with trying to make up for years of neglect in the range of railway infrastructure, they generate barriers in smooth flow of cargo, and some of these phenomena is directly perceived, even by the respondents from the railway environment. The most destructive aspect of their perceived lack of timing of particular investments, often implemented in parallel passageways, leading in the same direction. The scale spatial impact of this kind of problem is best evidenced by the fact however high rates indicate as the main problem of difficult access to Baltic ports in the Tri-City (simultaneous modernization works of all rail lines running out of the Tri-City), therefore the area quite distant from Wielkopolska.

**Assessment of transport policy in terms of the needs of intermodal transportation**

So intensive development of intermodal transportation in the Wielkopolska region would not be possible without the support of EU funds. For many entrepreneurs the opportunity to obtain external support was a direct impulse to make a decision about investments. Critique give however the formal aspect of these funds: a lack of flexibility in relation to the submitted applications, hindering the response to the needs of the market or the lack of funds allocated at the regional level.

Respondents also pointed the lack of a coherent state policy regarding the intermodal terminals. You should decide whether public support should serve the creation of large networks of small terminals or several large terminals (1 or 2 on the region)? Demand for small terminals due to the location of industry in the largest urban areas and on the costs of operating the terminal is limited. Large potential perceived while in the terminals providing integrated logistics services.

According to interlocutors implemented in recent years, railway investments are not always conducive to the development of intermodal transport. A meaningful example is the shortening of siding due to building crossovers with a larger radius of the arc. They enable driving at a higher speed on the return direction, which is desirable from the point of view of passenger traffic, the same process, however, often leads to difficulties in freight traffic - shorter tracks substation make freight trains do not fall within the station, with all its consequences. The problem is also being made within a modernization of the line - the liquidation of sidings. From the point of view of entrepreneurs planning to grow the logistic business, barriers are disproportionately high costs of building new sidings and crossovers and including them in the railway traffic control systems. Planning the development of intermodal transport is further hampered by the method of calculating the costs of access to rail infrastructure - preferential rates are set each year, usually only a few weeks in advance. With little difference in costs compared to road transport, instability casts doubt on the profitability of investment plans.

Infrastructural barriers in the development of intermodal transportation occur not only in transport by rail, but also - road. In the current situation [16], even on national roads sections with higher capacity are interspersed with sections of the inferior performance, making it difficult to efficiently overcoming the "last mile". However, during the upgrade, their full capacity is not provided, i.e. increasing the load capacity to 11.5 tons per axle. Respondents would expect such actions also in relation to regional roads and selected county. From the point of view of the carriage of goods priority become ring roads of the village, and not necessarily fast roads (motorways and expressways). Rail intermodal entrepreneurs , however, pointed the fact that the lack of effective control axle leads to unfair competition from road transport. This happens despite the established weight control departures from ports.

In turn, representatives of terminals drew attention to the need to protect the planning and logistics of industrial sites from uncontrolled suburbanization. The presence of logistic reduces the value of the adjacent land, which encourages speculation on the real estate market, encouraging the purchase of the purposes of the development of housing and boring process because of the noise.

It should be noted that some interlocutors also expressed opinions of that the spatial distribution of rail investments and their character much more support the development of intermodal connections with the German and Dutch ports than Polish. According to interlocutors, bearing in mind the interests of national ports, firmly step up its investment in favor of rail freight in the north-south.

## Conclusions

The basic conclusions of the analyzes include first of all,:

- divergent expectations of different actors,
- the occurrence of a variety of barriers to the development intermodal transportation, including educated by years of neglect barrier of awareness in environment,
- low degree of synchronization of investment, often nullify the action for the development of intermodal transportation,
- low awareness of the opportunities for using intermodal transportation among respondents,
- the dominance of road transport in service "typical" customer..

Among the threats of intermodal transportation should be mentioned specific directions decarbonisation of road transport. Not without reason among the innovations that contribute to improving the efficiency and competitiveness of transport in the light of EU policy are listed rather the innovations within the transport vehicle, and not measures for modal shift from road to rail and inland waterway [8]. Such actions weaken the pressure on the transfer of freight from road to rail.

For a change an interesting direction of research is the growing importance of CSR and the impact of this issue on the sector undertaken by the environmental decisions in the use of transport and logistics. The logistics sector, as the field of management, is prone to introducing CSR, moreover, action in the area of social responsibility of business can become a source of added value for the customer. [9] Followed by the gradual development of formal legal framework for corporate social responsibility [4] However, it should be noted that the degree of perception of the relevance of this issue is different. Particularly in countries aspiring to development, including in Poland, still prevails appreciation for the short-term financial gain at the expense of long-term organic growth, and the declarations of the implementation of social responsibility in case of some entities are not covered by real actions [1]. The collected data in interviews seem to confirm the cited literature.

From the perspective of policy-making and development of the region, Wielkopolska is naturally predestinated to use its favorable geographical location. The role of the current asset, which is the temporal proximity to the German border rail with a relatively good performance, will slowly, gradually counteracted. In the long term can be expected to change in the direction of transport development, though it is difficult at present to predict the extent to develop transcontinental route exchange using the rail link [2], and to what extent - maritime transport will use the opportunity of shipping moving north-east [5]. Huge saturation of terminals the voivodeship and especially the agglomeration makes, however, that regardless of the direction of the development of long-range connections (Siberian railway, inland navigation via the Baltic Sea or Hamburg and Rotterdam) entrepreneurs from Wielkopolska will be provided with the availability of high-quality intermodal services.

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