



## BARRIERS LIMITING THE DEVELOPMENT OF INTERMODAL TRANSPORT IN POLAND - THE PERSPECTIVE OF BUSINESSES AND PUBLIC ADMINISTRATION

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**ABSTRACT. Background:** The purpose of this article is to identify the barriers resulting in poor use of intermodal transport in Poland and to indicate the actions currently taken by public administration and businesses to change this unfavourable situation, such as creation of the Intermodal Transport Council at the Ministry of Transport, Construction and Maritime Economy or the planned creation of Polish Intermodal Transport Cluster.

**Methods:** The article focuses on an expert analysis of the barriers limiting the development of intermodal transport in Poland. The author presents the results of selected research projects implemented by him and financed from the funds of the European Union, and the outcomes of initiatives undertaken at the level of the European Union and of Polish government administration.

**Conclusions:** The barriers limiting the development of intermodal transport in Poland presented in the article and the identified activities which are to change this unfavourable situation show how to cope with the challenges connected with the continuously growing volume of freight transport in Poland in a way that is economically viable and responsible towards the environment, the climate and man.

**Key words:** Intermodal transport, barriers to intermodal transport, FLAVIA project, EMPIRIC project.

### INTRODUCTION

Intermodal transport is a complex transport process where freight is moved by vehicles representing various modes of transport [Mindur, 2002]. The businesses' main reason to use it is the fact that intermodal transport enables them to take advantage of an optimum set of the service and cost features characterising particular means of transport [Coyle, Bardi, Langley Jr., 2002].

Since Poland is situated in the centre of Europe and the main transport corridors run across its territory, it can use practically all

modes of transport for intermodal carriage, i.e. road transport, rail transport, sea transport and inland waterway transport. Unfortunately, despite many attempts to develop intermodal transport, its share in Poland remains very low - for instance the share of intermodal transport in rail transport at the end of 2011, estimated based on data from the Office for Rail Transportation (UTK), calculated by freight weight, was 2.2% [Hajdul, 2012]. Combined with the continuous growth of trade (domestic transport, export, import, transit), these results in a situation where a growing number of transport routes, especially in road transport, reach their maximum capacity and it is becoming increasingly difficult or practically

impossible to organise transport processes efficiently and effectively.

## **BARRIERS TO THE USE OF INTERMODAL TRANSPORT IN POLAND**

The research work undertaken by the employees of the Institute of Logistics and Warehousing (ILiM) and performed within the described initiatives shows that the issues of intermodal transport development in Poland are very complex and require multifaceted consideration. There are a number of legal, administrative & organisational, economic & financial, technical & technological barriers which hinder any greater use of intermodal transport [Mindur, Krzyżaniak, 2011].

### **Economic & financial barriers**

The use of intermodal transport is limited mostly for economic reasons - intermodal transport is too expensive. This results from too high fees for access to railway infrastructure for intermodal operators.

The transport financing system is another obstacle to the development of rail transport in Poland. While road carriers are exempt from the majority of charges, referred to as external costs, and the road network maintenance, modernisation and development costs are borne by the State, railway carriers must incur the railway network maintenance and development costs. Modernisation of railway infrastructure is covered by the network manager (PKP PLK S.A.) from the fees collected from railway carriers for access to the network [Jeleń, Foltynski, Guszczak, 2011].

### **Technical & technological barriers**

The other barriers include lack of tools for effective implementation of the national Transport Development Strategy for Poland, adopted on 22 January 2013 by the Council of Ministers, and inadequate quality of transport services, reflected for instance in low commercial speed of rail transport. According to the data of the Office for Rail Transportation (UTK), the average commercial speed of

freight trains in Poland in 2012 was about 29 km/h.

Table 1. Average commercial speed of freight trains in Poland in 2012 by railway carrier

Tabela 1. Średnia prędkość pociągów towarowych przewoźników kolejowych w Polsce w 2012

Name of carrier	Average speed [km/h]
CTL Express	42
CTL Logistics	23
DB Schenker Rail Polska	24
Lotos Kolej	34
Majkoltrans	80
PKP Cargo*	35
PKP LHS	40
Rail Polska	18
STK	25

Source: Office for Rail Transportation (UTK)

For comparison, the average commercial speed in rail transport in other European countries is as follows:

- Hungary - 32 km/h,
- France - 64 km/h,
- Sweden - 65 km/h,
- Germany - 71 km/h.

The most important qualitative parameter in intermodal transport is the commercial speed between the dispatch site (for instance a sea port) and the collection site (for instance an inland container terminal). Railway travel time must be competitive with road travel time. To make intermodal transport more competitive with long-distance road transport, railway infrastructure manager must improve the condition of linear infrastructure and change the rules governing the assignment of train routes within annual train schedules, making intermodal transport a bigger priority.

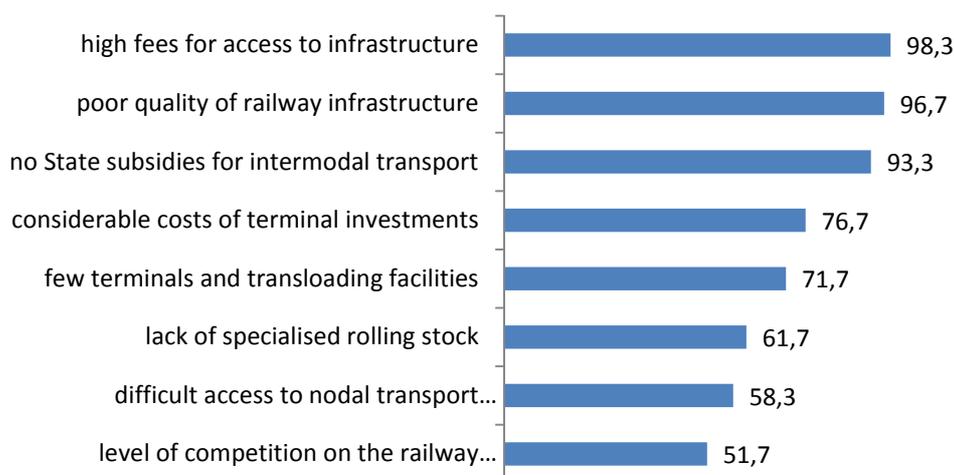
### **Legal, administrative & organisational**

Legal, administrative & organisational barriers are as follow:

- lack of legal regulations governing the operation of the intermodal transport organizer,
- no permanent dialogue between the representatives of the public administration and business.
- lack of logistics centers causing reduction of the cargo - difficulties in intermodal block trains building up,

- lack of uniform and comprehensive information system in the whole intermodal transport chain,
- lack of comprehensive and effective instruments promoting the intermodal transport within the framework the national transport policy, in particular the lack of financial support,
- lack of a coherent long-term transport (intermodal) policy, taking into account the needs of the country and the transit location of Poland on the map of Europe.

The significance of those barriers is also confirmed by the results of surveys conducted by the Office for Rail Transportation (UTK) among railway carriers. They believe high fees for access to the infrastructure and poor quality of services reflected in low commercial speed to be the biggest barriers to the development of intermodal transport in Poland. Results of the surveys are shown in the chart 1.



Source: Office for Rail Transportation (UTK)

Fig. 1. Barriers to the development of the intermodal transport market (percentage of respondents)

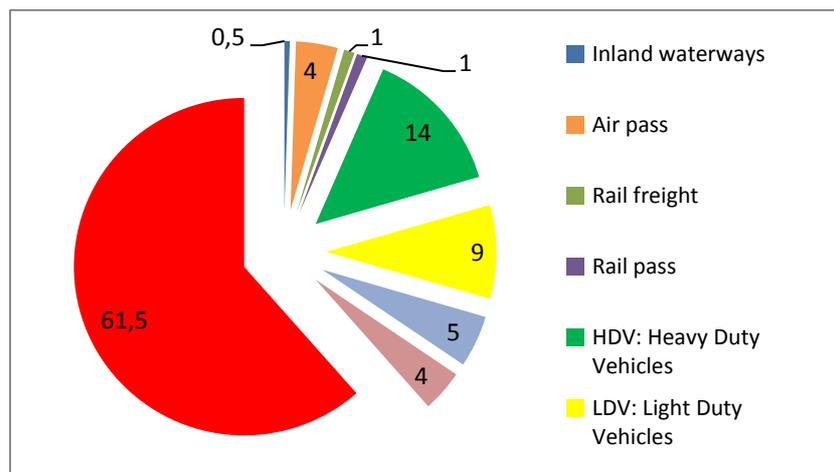
Rys. 1. Bariery rozwoju rynku transportu intermodalnego (odsetek odpowiedzi)

## WHITE PAPER - CHALLENGES

In March 2011, the European Commission published a White Paper (Brussels, 28.3.2011, COM 2011, 144 final) regarding transport. Known as the "Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system," it is a strategic document. The White Paper offers evaluation of the transport policy in the recent years and research results regarding long-term challenges; it also permits identifying the objectives for the upcoming 40 years - until 2050, and it defines specific framework conditions for transportation policy activities for the upcoming 10 years.

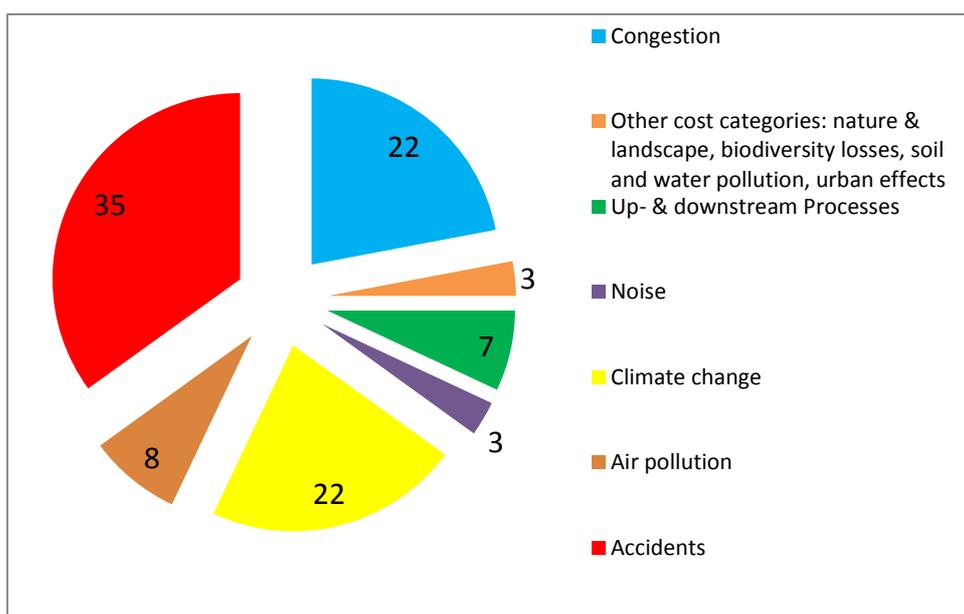
To achieve a 60% reduction in pollutant emissions from transport in the face of the society's growing need for mobility, the White Paper defines the criteria for both transportation policy and progress evaluation. According to them, 30% of long-distance road freight (over 300 km) should shift to rail by 2030, and more than 50% by 2050.

A study focusing on external cost of transport conducted in 2011 jointly by CE Delft, INFRAS and Fraunhofer ISI [External cost of transport in Europe, 2011] shows that external costs are much higher for road transport than for rail transport.



Source: External Costs of Transport in Europe, Update Study for 2008, CE Delft, INFRAS, Fraunhofer ISI, Delft, November 2011

Fig. 2. Total external costs of transport by transport mode  
Rys. 2. Całkowite koszty zewnętrzne transportu wg typów transportu



Source: External Costs of Transport in Europe, Update Study for 2008, CE Delft, INFRAS, Fraunhofer ISI, Delft, November 2011

Fig. 3. Total external costs of transport by externality  
Rys. 3. Całkowite koszty zewnętrzne transportu w stosunku do ich wpływu na otoczenie

Among the means of road transport, the biggest share in external costs of transport belongs to cars (61,5%), which are followed by heavy duty vehicles (14%), light duty vehicles (9%), motorcycles and mopeds (5%) and buses and coaches (4%). Then comes air transport,

the share of which in external costs of transport is 4% (only internal EU flights were taken into account). The share of rail transport is just above 1%, and of inland waterway transport - only 0.3%. Sea transport was not considered in the study.

With a share of 35%, accidents dominate in external costs. Congestion and climate change constitute 22% each. The lowest external costs of transport (3%) are related to the noise emitted by vehicles during carriage.

In connection with those ambitious challenges which arise from the White Paper and which are to help reduce environmental pollution, the European Commission decided to support initiatives promoting intermodal transport as it entails the lowest external costs and may be a real alternative to road transport. This support is found for instance in the financial aid provided via the Marco Polo II programme (for more visit [www.ec.europa.eu/marcopolo](http://www.ec.europa.eu/marcopolo)), addressed to companies offering new or significantly modified services in terms of the way of transporting freight - a shift from congested roads to more environmentally friendly modes of transport, such as rail, sea and inland waterway transport.

Another tool of support for intermodal transport is to subsidise research projects which aim to identify and eliminate the barriers and bottlenecks limiting the use of that mode of transport. Via the Interreg Central Europe financial programme (for more visit [www.central2013.eu](http://www.central2013.eu)), the European Commission supported EMPIRIC and FLAVIA - two international research projects in which the Institute of Logistics and Warehousing (ILiM) is directly involved.

## THE EMPIRIC CORRIDOR PROJECT

The growing demand for transport services, especially at the Baltic Sea, keeps increasing the significance of the 2nd transport corridor, known as the Baltic-Adriatic corridor, running from the north to the south. Unfortunately, the still poorly developed transport infrastructure permits using mainly road transport, which affects the natural environment. This encouraged the partners from the countries situated at the Baltic-Adriatic corridor (Poland, the Czech Republic, Austria, Hungary, Slovenia, Italy) to create a consortium within the EMPIRIC project (Enhancing Multimodal Platforms, Inland waterways and Railways

services Integration in Central Europe). The project is to provide transport operators and logistics service providers with the instruments and the framework conditions to support the process of activating and improving multimodal connections integrating the ports of the northern Adriatic with Central Europe. The project is to help prepare investments, define the joint tools increasing the appeal of multimodal transport, and improve the infrastructure connecting those regions. Due to the size of the area, local approach is inadequate so ensure a satisfactory solution, which is why the project adopts a transnational approach, integrating representatives of the countries of the Baltic-Adriatic corridor. The following figure shows the EMPIRIC transport corridor.



Source: ILiM own source

Fig. 4. EMPIRIC transport corridor

Rys. 4. Korytarz transportowy EMPIRIC

The main objective behind the EMPIRIC project is to ensure appropriate conditions for new multimodal services provided within the Baltic-Adriatic corridor and for the related investments so that multimodal transport, especially rail and inland waterway transport, can become a more appealing solution. Other objectives include improving the technological and political instruments which enable transport operators and logistics service providers to develop effective and sustainable transport solutions and supporting the connections between economically viable multimodal services, provided especially between NAPA (North Adriatic Ports) and the

regions of Central Europe. It is also important for the partners to prepare initial conditions for the infrastructural investments to be used for new, alternative services provided within multimodal platforms and to evaluate the economic, social and environmental effects of such investments.

The creation of strong structural foundations of economic growth includes an efficient transport system. From the point of view of Poland's development objectives, it is important that the transport not only stops being a barrier hindering economic development of the country but also becomes an element significantly contributing to its development, which can be achieved by building adequate infrastructure and providing high quality services on a free, competitive and indiscriminative market.

With European assistance, building a network of motorways and express roads and modernizing the most important railway lines is a feasible task. Modernization of the basic transport network and providing for high quality transport services so that transport contributes adequately to economic development is the most essential task for the upcoming years until 2025. An efficient transport system will contribute to the improvement of standards of living, improved accessibility to built-up areas, and an increase

in foreign investment in Poland. At the same time, the increasing demand for transport posed by the economy will be subject to 'control' in accordance with the principle of sustainable development. By the year 2025, the transport system of Poland will meet all the requirements that the transport system of highly developed countries and it will be able to meet Polish and international transport users' expectations in terms of mobility and high quality transport services in line with environmental standards. Implementation of the various transport Policies and incentives requires further actions in order to create specific documents to develop each separate objective.

The most important transport policy in Poland is the National Transport Policy (NTP) 2006 -2025 which is a concise document of 34 pages which was produced by the Ministry of Infrastructure and approved by the Council of Ministers on 29th June 2005. It is currently the key long-term strategy document in the transport sector in Poland.

The following table shows the incentive policies to multimodal transport mapped by the Empiric project in Poland. The policies below are still active but not mapped as active policies for multimodal transport, not being specifically devoted to it.

Table 2. Incentive policies to multimodal transport in Poland mapped by the Empiric project  
Tabela 2. Zachęty dla rozwoju transportu multimodalnego w Polsce zmapowane w projekcie Empiric

Title	Funding type	Main objective
National Transport Policy 2006 – 2025	Key long term strategy	Key long term strategy document in the sector in Poland
Exemption from real estate and transport taxes	Tax incentives	Originators of new jobs can be totally or partially exempted from real estate tax
Support for employers under the Labour Found	Support for employers	Entrepreneurs who satisfy specific criteria can apply for financial assistance from the Labour Fund
Special Economic Zones	Establish of Special Economic Zones	Accelerate economic growth of the country's regions, make use of post-industrial property and infrastructure e.g. construction of highway, modernization of the railway track or intermodal terminal

Source: EMPIRIC project, Actions to promote multimodal transport in Central Europe, Policies analysis and companies needs

## THE FLAVIA CORRIDOR PROJECT

FLAVIA (Freight and Logistics Advancement in Central/South-East Europe - Validation of trade and transport processes, Implementation of improvement actions, Application of co-coordinated structures) is another project addressing the issues of intermodal transport.

The FLAVIA international project is a contribution to the improvement of logistics in Central and South-Eastern Europe. Due to the validation of mechanisms and of transport and commercial processes, the project presents assumptions for the improvement and consolidation of international cooperation conditions. 14 partners from 7 European countries - Germany, Poland, the Czech Republic, Slovakia, Austria, Hungary, Romania - participate in the project by creating the FLAVIA corridor. The following figure shows the FLAVIA transport corridor.



Source: ILiM own source

Fig. 4. FLAVIA transport corridor  
Rys. 4. Korytarz transportowy FLAVIA

The project supports intermodal cooperation and joint development of a logistics corridor between Central and South-Eastern Europe. Strengthening intermodal transport between the regions of the corridor helps improve the integration of markets within the European internal market. To ensure the competitiveness of the regions participating in the project, assumptions related to Green Logistics and to shift of freight transport from roads to green modes of transport, such as

railway and inland waterways, have also been studied.

Intermodal transport in the FLAVIA corridor has a high potential to develop new trade and transport routes. But, to ensure efficient trade and transport relations in future the transport chains within the region have to be extended and developed. This concerns the establishment of reliable transport services to enhance the accessibility as well as the construction of an integrated transport network that enables multimodal logistics approaches. This requires a number of measures to overcome the barriers identified in the FLAVIA project.

Infrastructural, technical, organizational and administrative measures are as follow:

- Terminals within the FLAVIA corridor have to expand their handling area.
- Modernization of existing multimodal infrastructure for overcoming cross-border problems.
- Capacity of rail infrastructure is assessed as a high obstacle because in many countries the infrastructure does not reflect the needs of the transport market actors. Hence - usage of multimodal transports could have only supportive role in organization of overall transportation solution. Therefore, the extension of the rail capacity should be moved in the focus of national transport plans.
- The rail management systems within the FLAVIA corridor is far away from completion by the different national systems and built in the short and medium run a barrier for intermodal transport. This situation should be changed by a consecutive harmonisation.
- Waiting times due to inefficient organisational processes should be reduced for freight trains at borders within the FLAVIA corridor and on the external borders. The main obstacles at the borders like inefficient cross border processes, heterogeneous licence and legislation within each country as well as interoperability issues should be addressed by bi- and multilateral negotiations and agreements.
- Concerning the requirements of the market players, the costs of rail innovations are perceived as high. This probably is one of the major barriers to the successful adoption

of the innovations in the rail transshipment market. In this market, costs are very important and cannot always be recovered through charging higher prices. For intermodal freight transport necessary innovations should be supported by national and international research and implementation funds.

- Licensing time and responsibilities as a major problem, policy stakeholders should start to create a common licence and legislation level within the FLAVIA corridor as well as the EU. A lot of license and legislation still differ within each FLAVIA country and result in a lot of additional administrative and operative work which makes rail and intermodal transport unattractive.
- The implementation of obligatory safety and security standards within intermodal supply chains (storage, transport process, turnover process, loading unit, wagons etc.) will increase the reliability of this mean of transport drastically [Guszczak, Jeleń, 2013].

## **INTERMODAL TRANSPORT COUNCIL**

The need to intensify intermodal transport development activities was noticed at the national level as well - on 11 December 2012 Sławomir Nowak, the Minister of Transport, Construction and Maritime Economy, established the Intermodal Transport Council [Journal of Laws of 11 December 2012, item 84]. As an auxiliary body, the Council focuses on improving the conditions for the functioning of intermodal transport in Poland by initiating activities to eliminate the existing barriers - both legal and organisational ones - inhibiting the development of this mode of transport. The tasks of the Council will include identifying the solutions necessary to ensure the development of intermodal transport.

The following organisations supported the creation of the Intermodal Transport Council and became its members: PKP S.A., Instytut Kolejnictwa (Railway Institute), PKP Polskie Linie Kolejowe S.A., PKP Cargo S.A., Civil Affairs Institute (INSPRO) in Łódź, PCC

Intermodal S.A., Polzug Intermodal Polska Sp. z o.o., Federation of Independent Rail Operators (ZNPk), Overland Transport Chamber of Commerce (IGTL), Institute of Logistics and Warehousing (ILiM), Polish Chamber of Commerce (KIG) and Polish International Freight Forwarders Association (PISiL).

One of the first tasks of the Council members is to prepare recommendations for amendment of the regulations regarding the methodology for calculating the fees for access to railway infrastructure for intermodal transport.

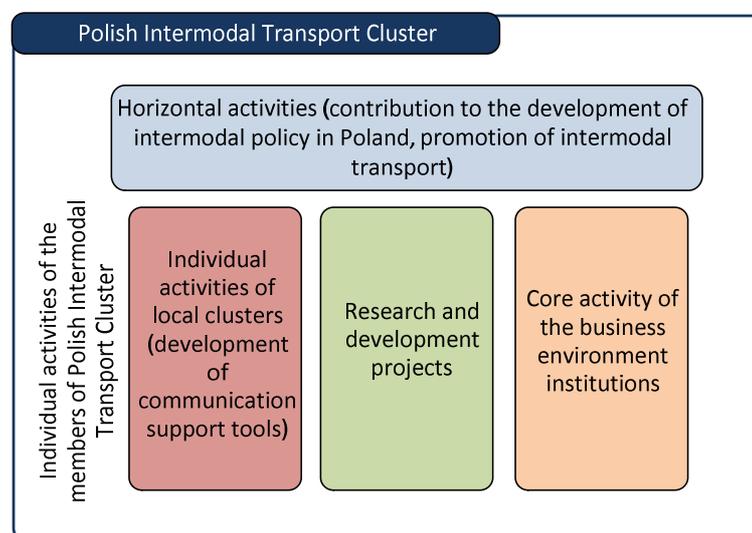
## **POLISH INTERMODAL TRANSPORT CLUSTER**

Entrepreneurs are not indifferent to the development of intermodal transport in Poland, seeing it as an opportunity to increase the efficiency of their logistics chains. They take the steps to integrate the hitherto dispersed actions into one cluster initiative. Coordination of individual initiatives seems necessary since it will permit, via to economies of scale, to eliminate the basic barriers limiting further development of intermodal transport in Poland more effectively and efficiently. Such cluster activities have been initiated by the Institute of Logistics and Warehousing (ILiM), which - as a leading European research unit - together with representatives of selected companies (manufacturing, commercial, service companies) intends to create Polish Intermodal Transport Cluster with the main task of intensifying the actions supporting the development of intermodal transport in Poland. The notion behind the works performed within the cluster is shown in Figure 6.

Cluster activities are generally related to the following areas:

- Cooperation with national and regional authorities, to develop effective transport and infrastructure policies and strategies,
- Facilitate public participation in development policy and strategy building process,

- Providing expertise and assistance in the field of sustainable transport planning and development,
- Promotion and dissemination of innovative technologies and tools in intermodal transport,
- Research and dissemination of knowledge about planning and development of integrated, multimodal transport systems.



Source: Compilation of the Institute of Logistics and Warehousing (ILiM)

Fig. 6. Activities undertaken within Polish Intermodal Transport Cluster

Rys. 6. Aktywności podejmowane przez Polski Klaster Transportu Intermodalnego

## CONCLUSIONS

The progressing European integration and globalisation processes have been continuously increasing the distance that freight has to travel. And this is where a special advantage of rail freight transport can be found. Other trends, such as the systematically growing volume of container cargo transhipped in Polish sea ports (in 2012 it grew by almost 23% TEUs when compared to 2011 [Namiary na Morze i Handel, 2013]), development of the infrastructure of container terminals or the increasing significance of energy efficiency of particular modes of transport (the system advantage of rail transport) open new possibilities for intermodal transport as well. Additionally, intermodal transport has become more competitive and more customer-oriented due to the opening of the market, competition growth, and the resultant variety of services offered.

The barriers limiting the development of intermodal transport in Poland presented in the article and the identified activities which are to change this unfavourable situation show how to cope with the challenges connected with the continuously growing volume of freight transport in Poland in a way that is economically viable and responsible towards the environment, the climate and people.

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## BARIERY OGRANICZAJĄCE ROZWÓJ TRANSPORTU INTERMODALNEGO W POLSCE Z PERSPEKTYWY ADMINISTRACJI PUBLICZNEJ ORAZ ŚRODOWISKA BIZNESOWEGO

**STRESZCZENIE. Wstęp:** Celem niniejszego artykułu jest identyfikacja barier wpływających na niskie wykorzystanie transportu intermodalnego w Polsce, a także wskazanie obecnie podejmowanych na gruncie administracji publicznej oraz przedsiębiorstw działań mających na celu zmianę niekorzystnej sytuacji, np. powstanie Rady ds. transportu intermodalnego działającej przy Ministrze Transportu, Budownictwa i Gospodarki Morskiej, planowane utworzenie Polskiego Klastra Transportu Intermodalnego.

**Metody:** Prezentowany artykuł koncentruje się na eksperckiej analizie barier ograniczających rozwój przewozów intermodalnych w Polsce. Autor przedstawił wyniki wybranych projektów badawczych finansowanych ze środków Unii Europejskiej, których był realizatorem, inicjatyw podejmowanych na poziomie Unii Europejskiej oraz administracji rządowej w Polsce.

**Wnioski:** Przedstawione w niniejszym artykule bariery ograniczające rozwój przewozów intermodalnych w Polsce oraz wskazane działania mające na celu odwrócenie tej niekorzystnej sytuacji, pokazują jak można podjąć wyzwaniom związanym ze stale rosnącym wolumenem transportu towarowego w Polsce w sposób ekonomicznie opłacalny oraz odpowiedzialny wobec środowiska, klimatu i człowieka.

**Słowa kluczowe:** transport intermodalny, bariery w transporcie intermodalnym, projekt FLAVIA, projekt EMPIRIC.

## DIE DIE ENTWICKLUNG DES INTERMODALEN TRANSPORTS IN POLEN EINSCHRÄNKENDEN BARRIEREN AUS DER PERSPEKTIVE DES ÖFFENTLICHEN VERWALTUNGSWESENS UND DER BUSINESS-KREISE

**ZUSAMMENFASSUNG. Einleitung:** Das Ziel des folgenden Artikels ist es, die Hindernisse zu erforschen, die sich auf die geringe Ausnutzung des intermodalen Verkehrs in Polen auswirken und die derzeit durch die öffentliche Verwaltung und Unternehmen getroffenen Maßnahmen zur Veränderung dieser negativen Erscheinung, z. B. Gründung eines Rates für intermodalen Verkehr beim Ministerium für Transport, Bauwesen und Seewirtschaft oder die geplante Eröffnung des Polnischen Clusters für intermodalen Verkehr, zu bestimmen.

**Methoden:** Der vorliegende Artikel konzentriert sich auf einer Expertenanalyse in Bezug auf die Hindernisse, die die Entwicklung des intermodalen Verkehrs in Polen hemmen. Der Autor präsentierte die Ergebnisse ausgewählter Forschungsprojekte, die aus den Mitteln der Europäischen Union gefördert wurden und an deren Realisierung der Autor selbst arbeitete, sowie bestimmter Initiativen auf der Ebene der Europäischen Union und der Regierungsverwaltung in Polen.

**Fazit:** Die in dem vorliegenden Artikel erläuterten Hindernisse bei der Entwicklung des intermodalen Verkehrs in Polen und die hier genannten Maßnahmen zur Veränderung dieser negativen Erscheinung zeigen, wie man den Herausforderungen im Zusammenhang mit dem permanent steigenden Warentransportvolumen in Polen auf eine vom Standpunkt der Wirtschaft her rentable und der Umwelt, dem Klima und dem Menschen gegenüber verantwortungsbewusste Art gerecht werden kann.

**Codewörter:** der intermodale Transport, Einschränkungen innerhalb des intermodalen Transportes, das FLAVIA-Projekt, das EMPIRIC-Projekt.

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