Bulletin of the Maritime Institute

Gdańsk, 2000, 27, 1

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LOGISTICS CENTRES IN POLAND, WITH SPECIAL ATTENTION GIVEN TO THE POMORSKIE VOIVODSHIP

Abstract

Logistics centres with direct access to the national transport network, representing a variety of branches of transport, serve the regional, national and international markets.

The existing in Europe logistics centres are economically effective, very profitable and positively influence regional development.

Selection of their location depends on the cargo mass, on the intensification of cargo flow, and on the categories of cargo gravitating towards the area in which the centre is to operate.

A characteristic and economical importance of logistics centres in aspect of their proposed location in Poland

Basing on informatics systems, logistics aim at optimum shaping of supply chains beginning from the producer of raw materials, including their processing and distribution, and also the trade and transport to consumer links.

Logistics centres form an independent economical subject, located in a specific, land area, connected with the environment by various branches and types of transport.

The centre must have an appropriate infrastructure, such as roads, storage places, parking areas, warehouses, computers and means of communication. It also must have well trained personnel and proper organisation so that it can offer logistics services in transportation, cargo handling, storage, separation and completing, at the same time realising supply and distribution functions by short- or long term orders with various companies. They also should offer additional services (added value).

Such a centre forms an important link in the national transport system, being at the same time an important trade, distribution and service centre, operating in accordance with the principles of logistics. The first and basic criterion for determining the possible location of a logistics centre is the quantity and intensity of cargo flow, taking into account the means of transport.

The latest draft Polish transport policy document, developed at the Ministry of Transport and Maritime Economy, underlines the fact that the Polish transport system has the natural and technical conditions to become an important platform for the European logistics transport system. This is because we offer not only transit possibilities, but also organisation of multimodal transport and complex storage and transportation services provided by inter-branch centres forming an alternative to the overloaded West European network.

The necessary condition for the realisation of this objective is a possibly quick development in Poland of a complex-logistics character. This should be attained by generating the new type of transport centres – the logistics centres.

Logistics centres should and can be formed in such places, in which significant cargo streams are present and where centres or main branches of important shipping companies operate.

In December 1999 was finished the first in Poland research project on logistics centres, titled *"Concept of location of logistics centres in Poland"*. The Ministry of Transport and Maritime Economy ordered the work, and the invitation for tenders for the project was announced by the Committee of Scientific Research [1]. The work presents a concept of distribution of logistic centres in Poland, treating the centres as necessary elements of the Polish transport system, and taking into account the need to connect into the EU logistic systems.

The centres will be located basing on own, original methods of modelling transport systems, which allow to generate various transport scenarios, and to evaluate alternative solutions in accordance with the principles of logistics.

The design of spatial structure of logistics centres was based on the present and the predicted volumes and directions of cargo transportation, both in national and international relations, and of transit through Polish territory. The predictions resulted from the national policies of industrialisation, spatial development, environment protection and economical co-operation with other countries. Realisation of these policies will influence the magnitude and structure of demand and supply of logistics services and their distribution in space.

A significant influence on the development of the centres and on their hierarchy will be exerted by the national transport policy. On the basis of the agreement signed by the Ministers of Transport of Baltic countries and by the European Commission, representing the European Union, a programme for common actions for sustainable development of the European transport system was adopted. The common programme promotes:

- development of intermodal transport, basing on competitive with respect to land transport short sea shipping services,
- development of an advanced logistics system,
- better use of techniques and new technologies,
- implementation of common communication systems and of EDI,
- connecting local and long range transport by means of co-operation strengthened by informatics systems,
- better use of means of transport, higher throughput of warehouses and storage places,
- lightening the burden of transit traffic through cities,
- improvement of economical attractiveness of given regions and generation of new work places.

The selection of sites for logistics centres of international importance will influence the size, rank and specialisation of other logistics centres serving the national market. The programme for optimising the development of the logistics network was based on a system of transport corridors and centres of gravitation and distribution of cargo mass in international and national traffic.

The concept of location of logistics centres in Poland is significantly influenced by the location of existing and planned centres in neighbouring countries. These conditions were used during the designing and verification of consecutive variants of solutions. During the verification of solutions, the draft designs of bases were confronted with solutions adopted in other countries, with special attention given to already functioning logistcs centres in the Netherlands, Germany and in the Scandinavian countries.

Analysis, evaluation and verification of the solutions for locating logistics centres were realised basing on specially developed and improved methods of logistics network nodes. An important part of the verification process was the comparison of the magnitude and structure of investment with the possibilities of its financing and with the timetable of infrastructural transport investments.

A significant role in modern logistics solutions is played by electronic communication systems between the participants in the distribution/transportation process. The advanced telematics systems, implemented in cargo traffic by sea, could be easily extended to cover the whole area of Poland. They would allow electronic information flow, including EDI, between the participants of the logistics chains. The required process of introducing informatics into logistics services was presented in reports on the concept of spatial distribution of the centres and in the pilot study report.

Since the logistics centres are nodes in the network of multimodal transport corridors, in that also of the sea multimodal systems, they will be mainly located on the North-South and West-East routes, along the planned and built at present motorways (A1, A2, A3, A4) and along the modernised international railway lines. These motorways and railways form, together with other kinds of transport, the multimodal transport corridors.

Besides the logistics centres of the central region (Warszawa and Łódź), Wielkopolska region (Poznań), Silesian region (Gliwice and Wrocław) and eastern region, further investigations will be focused on centres of the Three-Town and the Szczecin-Świnoujście regions. These two last centres will act as nodes of multimodal land/sea transport corridors, opening for Polish export and transit wide prospects of transport connections with the networks of Baltic countries and with sea ports of the whole world.

Basing the logistics system on a network of logistics centres ensures advantageous effects not only in the scale of national economy, it is also profitable for the direct customers of the centres. Among others, the profits are expressed by lower transport and storage costs, because the required reserve stocks can be reduced in result of quicker supply and reception of the cargo. At the same time, logistics centres ensure higher quality of services offered to the customers.

Investigations carried out in selected Polish companies, and the results of similar investigations in western countries, indicate that depending on branch and size of enterprise, the so-called logistics costs amount to 10 to 20% of the total cost. The same investigations also show that even elementary rationalisation in this area allows to reduce these costs by about 10%. Therefore it may be expected that realisation of the present project will result in solutions ensuring significant savings. According to expert opinions, the smaller stock reserves, freeing of capital, shorter flow time, improved quality, reliability and safety can in effect reduce the logistics costs even by 20-30%. This means that the total cost of functioning of companies and of national logistics channels would be reduced by 2-6%.

Because of the high effectiveness of the logistics centres, especially when their location is correct, implementation of the present project is quite realistic.

Developing a logistics centre from the very beginning is very costly. For example, experts evaluate that building an international distribution centre would cost about 100 mln USD. Therefore, the best way of financing such investments would be to form companies

with participation of capital of the local territorial selfgovernments and of the interested enterprises, especially of transport/shipping enterprises. An important source of financing could be the capital of foreign investors, which are very interested in such projects.

The financing of development of national and international range logistics centres should be also supported by the State Exchequer and budget. It is worth pointing out that the high interest of investors in building logistics centres is due to the relatively short return period of the investment.

Assumptions and location of the Pomeranian Logistics Centre

The intensely developing in the world logistics centres, being multi-task objects in the transportation and distribution process, are independent economical subjects, connected with the networks of various branches and modes of transport.

It is symptomatic that our western neighbours, the Federal Republic of Germany, in their 1992 plans defined locations for 45 logistics centres, but as a model logistic centre they took the region of the port in Bremen.

Rotterdam, the largest port in the world, has now three logistics centres, and in the UK and USA such centres are also located in seaports. Therefore, in Task 7 of the research project *Concept of location of logistics centres in Poland*, which is a feasibility study for a pilot logistics centre, the example of the Pomeranian Logistics Centre in Gdańsk was considered.

A basic principle in selecting a location for a logistics centre is that the centre should be connected by at least two branches of transport, and of course higher throughput is attained by centres with more connections.

The best example is provided by the Three-Town region, where the logistics centre is located in the North Harbour in Gdańsk. Besides the presently built motorway A1, the centre has access to six branches of transport: railway, road, sea, inland, pipeline and air transport. This is because the centre is located close to the Gdańsk Refinery, which is connected by pipeline with the national pipeline network and with the pipeline of the oil terminal at the North Harbour, and is close to the airport at Rębiechowo, the services of which include "cargo" transports.

It also is worth stressing that according to the programme of development of the port in Szczecin, the logistics centre will be located on the Grabowski Ostrów. Apart of the development of infrastructure on the Katowicki Peninsula, building port infrastructure on the Grabowski Ostrów is the most important investment planned in the port development strategy. Both investments are included in the "Port Modernisation Project", which will be partly financed from World Bank credit.

The Pomeranian Logistics Centre in Gdańsk is located in direct neighbourhood of the North Harbour, to south-west of the Europort and the presently built Container Terminal.

It is assumed that the centre will function in connection with the seaports of the Three-Town agglomeration, and that it will offer services to the national and inter-regional transport. Functioning of the centre will significantly influence the organisation of road transports. Earlier investigations of international road transports showed that there is a large percentage of empty return journeys. Functioning of the centre will also allow to strengthen the ties between national and international transport in order to improve the effectiveness of transport capacity utilisation. Similar improvement of effectiveness could also be obtained for railway transports.

Besides the traditional transport, handling and storage services already realised by carriers and ports, the centre will realise logistics functions connected mainly with transport services in international relations.

Basing on developed forecasts, the potential volume of cargo tending to the Gdańsk centre was assessed. The following assumptions were adopted for the assessment:

1. The basis for the assessment were predictions of general cargo traffic, developed basing on:
   - the participation of each of the transportation techniques in Poland and their gravitation to the Pomeranian region for handling/transport services, weighted by the rates of change in the investigated period, and
   - trends of development of Polish foreign trade cargo in recent years.
2. Participation of general cargo to be served in the Pomeranian region will increase in the consecutive periods of the forecast from 20% of cargo volume in international traffic in 2005 to 25% in 2010 and 30% in 2015.
3. In national road transportation, about 40% of the cargo is moved in internal relations within the region. This part of the transports was excluded from the assessment. With respect to the remaining part of the transports, it was assumed that participation of gravitation towards the centre will be 2%, and in the next periods 3% and 4% respectively.

The logistics centre will perform an important role for large and small shippers and receivers of cargo. As experience of western countries shows, there is a demand for *"farm-it-out"* services, meaning long term contracts for supply of distribution and logistics services, since this results in improved quality and lower cost of the services. The *"do-it-yourself"* approach is characteristic for medium size trade partners.

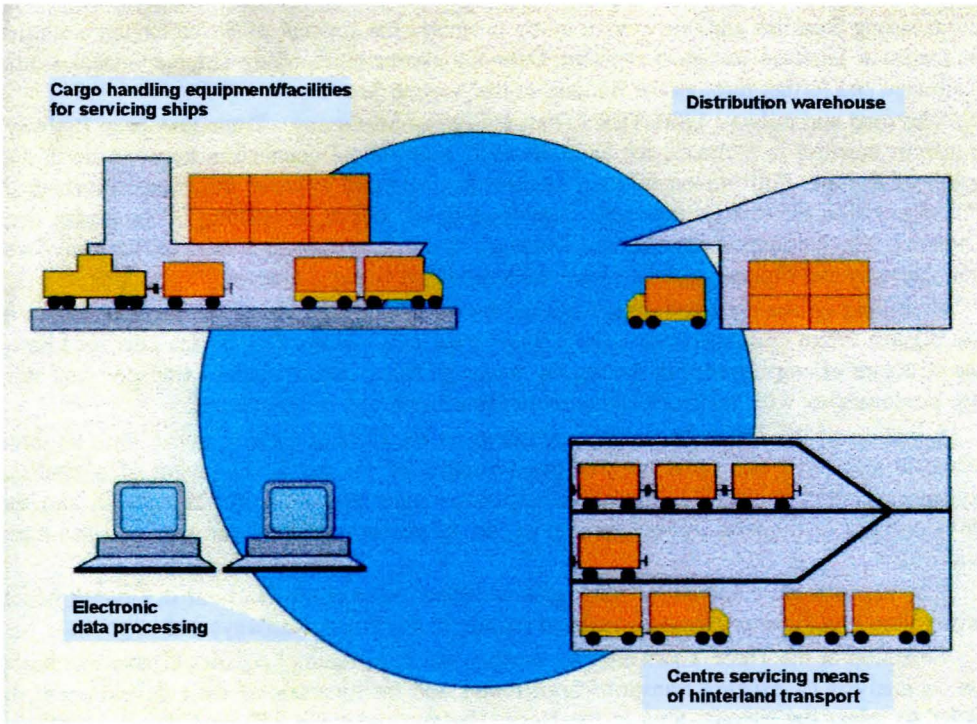

Fig. 1. Port as a logistics centre

The adoption of a given participation of cargo gravitating towards the centre, in relation to the total cargo volume passing through border/customs points of the region, results from the

structure of shippers and customers of services on the Polish market and in the region. The predicted increase of participation in the consecutive periods of the forecast results from the assumption that the range of offered by the centre services will grow with increasing demand of the customers. The strategy of development of the Pomeranian region is oriented towards active inclusion into the European transport system and fulfilling an integrating role between Scandinavia and Central-Southern Europe and between the countries of East and West Europe.

The big chance for a marked development of tourist and cargo traffic in Polish seaports, especially the ports of Gdańsk and Gdynia, is the development of the TEM-TER North-South transport corridor. This corridor can ensure a substantial increase of Polish foreign trade, profiting the whole national economy.

In the last years, due to initiatives of the Nordic Group and activation of the Kaliningrad region, appeared new advantageous phenomena, increasing the importance of the motorway. Implementation of the new concepts of motorways, either running along the Baltic coast (Via Hanseatica) or at some distance from the coast (Via Baltica) will extend the Central European transport network.

The present capacity of West European transport infrastructure, especially of Germany, results in congestion of Swedish and Norwegian land/sea transport. This was the basis for developing the concept of extending the TEM to Scandinavian countries – named "TEM Scandinavia". This new land/sea transport route, integrated with the TEM concept, connects the Swedish and Norwegian land transport system, especially its main part – the Karlskrone-Oslo stretch, with the discussed transport system.

A strong Swedish and Norwegian lobby promotes the concept of Scandinavian countries to realise a land/sea transport corridor Oslo-Karlskrone-Gothenburg-Gdynia/Gdańsk-Łódź-Katowice and further through the Balkans to the Aegean Sea.

The road and railway TEM-TER (Trans-European Motorway - Trans-European Railway) transport corridor is a chance for an alternative, multimodal connection between north and south of Europe. Full implementation of these projects will improve the competitiveness of Polish ports on the east Baltic coast, counteracting the effects of opening of the bridge over Öresund, which connects Sweden and Denmark. It will also activate tourist traffic from Sweden, Norway and Finland, and also from the Vyshehrad Group countries.

Summing up the collected data, it should be stated that location of the logistics centre in the biggest urban agglomeration – the Three-Town area – is the best choice also because of the structure of employment in the region, where services, industry, trade, transport and storage predominate, with only 15% of the work force employed in agriculture.

Location of the Three-Town agglomeration on the Gulf of Gdańsk coast, with its three seaports and three shipyards ensures good conditions for the development of a land/sea transport system centre. The traditional railway connection with the hinterland, and the development of the road system, in that of the A1 motorway, facilitate land and sea trade and traffic.

The planned development of the logistics centre in the North Harbour in Gdańsk began with many system improvements realised mainly in the Polish Railways and in ports.

Selection of the Three-Town area for locating the Pomeranian Logistics Centre was based on an analysis of existing transport/cargo routes and on forecasts of their development. In order to select the specific area in the North Harbour, where it will be built, an additional research study was carried out. In that study a range of variants was analysed.

The area for the Centre, marked in the plan of the port, covers over 200 hectares. The Pomeranian Logistics Centre is located near the planned container terminal of 500,000 TEU capacity, south-east of the Europort. This site is placed at the point of contact of five transport

branches, at a short distance from the Gdańsk refinery, which, as was earlier mentioned, is connected by pipeline with the central pipeline. It is also near the airport at Rębiechowo, which offers *"cargo"* services.

Such a location of the logistics centre gives big chances for development of co-operation with other centres, and ensures an advantageous participation in the developing land/sea cargo traffic in the Baltic Sea region.

References

[1] Ordered research project No. 023-13 *Concept of location of logistics centres in Poland* – Project Leader Prof. Dr. Maciej Krzyżanowski, Maritime Institute in Gdańsk.