

DEVELOPMENT OF LOGISTICS CENTRES IN POLAND

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***Abstract:** Present economy requires creating special new points, which allow optimal cooperation of all market participants. These points are created under the name of logistics centers. Development of logistics centers is strictly connected with development of new technologies. There are several methods of location of logistics centers. Creation of logistics centres in Poland results from both business strategies and global strategy of the country.*

Key words: logistics centre, transport, storage, location

Structure of logistics centre

Logistics centers in a most beneficial way, in strictly determined deadlines and at relatively low prices assure a physical realization of mass and diversified goods supplies¹. Activity of those centers contributes to further favorable changes of quality type. As an example an integration of production factors of manufacturing companies located in the region could be mentioned. This integration is performed with the help of open information system and coordinated logistics service.

Logistics Centre (LC) is an independent business entity, which is in power of:

- separated territory, connected with road and telecommunication networks,
- infrastructure, i.e. internal roads, squares, car parks, engineering and common buildings,
- technological equipment necessary for freight-reloading, warehousing and transport and IT devices,
- qualified personel,
- organization which fits to logistics task,

which offers logistics services (freight-reloading, warehousing, separation, assemblage, and transport). These services fulfill functions such as procurement, distribution within immediate orders or permanent contracts with external companies called here LC customers.

¹ Mindur L, Mindur M.: *Spoleczno-ekonomiczne aspekty tworzenia centrow logistycznych*. Logistyka 1/2002 p.18.

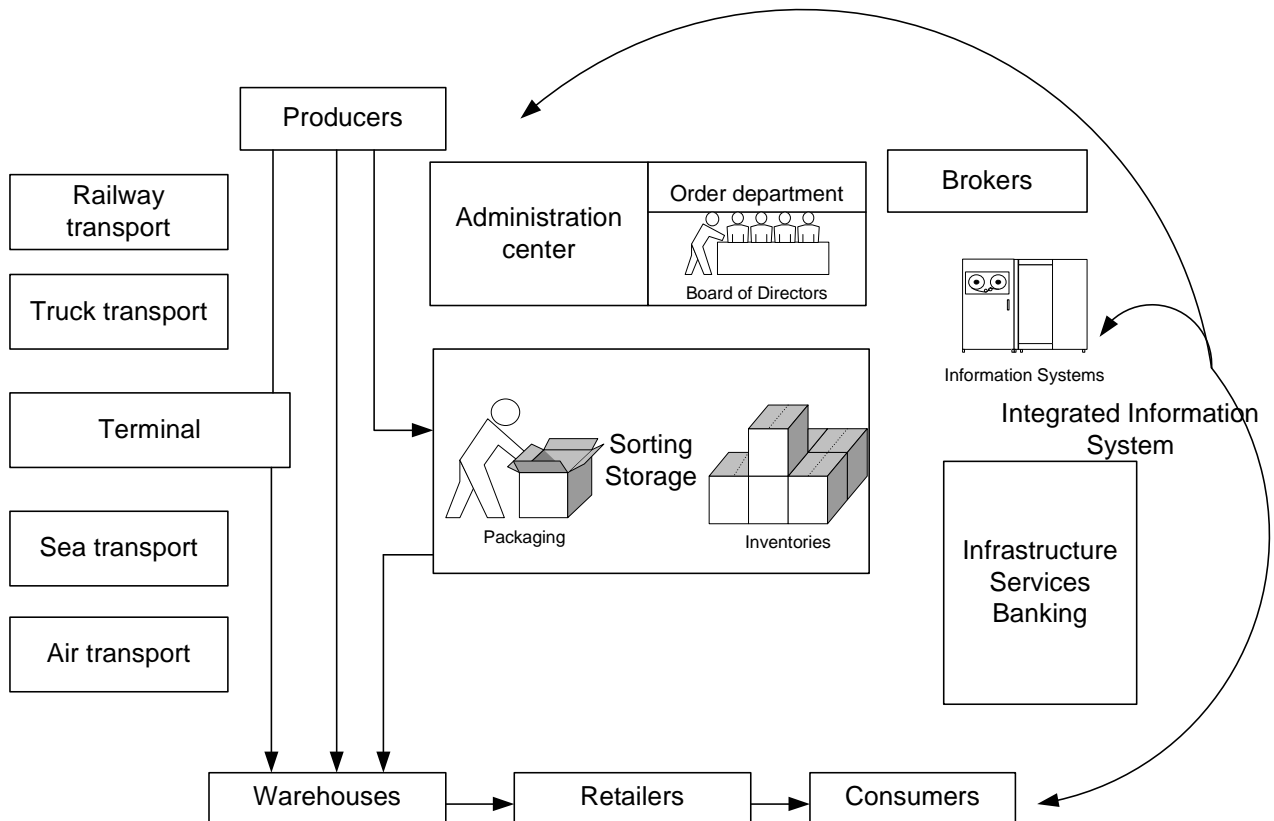


Figure 1. Logistics center and its surrounding

Source: S. Abt, *Zarządzanie logistyczne w przedsiębiorstwie*, PWE, Warszawa 1998, p. 211

The example how the logistics center look like is shown in the figure 1. Transportation, storage, packaging, labeling and other functions are concentrated in one place. Localization of such centers helps to coordinate work of all market participants.²

Development of logistics centers is strictly connected with development of new multimodal technologies, which offer an appropriate computer structure, adjusted to many transport branches. The basic rule accepted in the whole world in designing and locating logistics centers is to relate them directly with at least two transport branches. If the centre is able to operate with many transport branches, it is more attractive for customers³.

Functional structure of logistics centre consists of three basic areas⁴:

- intermodal transport system;
- multifunctional system of logistics services;
- electronically integrated telecomputer system.

² Grabara J., Jahnatek L., *Poprawa konkurencyjności przedsiębiorstwa dzięki nowoczesnym rozwiązaniom logistyki odwrotnej*, Zarządzanie w przedsiębiorstwie, cz.2, Wydawnictwo Politechniki Częstochowskiej, Częstochowa 2007, s.50-54

³ *Teoria a praktyka polskich centrów logistycznych.*, Spedycja Transport Logistyka 10/2001 p.44

⁴ *Centra Logistyczne w Polsce*, AE we Wrocławiu, Wrocław, 2001

With regard to type of the functional and spatial structure, two basic kinds of centers can be distinguished:

- integrated (ILC) – built in a close organizational and functional structure, usually with quite (sometimes even significant) distance from large city agglomerations;
- decomposed (DLC), for instance Euro Transport & Trade Centre in Frankfurt an der Oder. DLC are characterized by:
 - a pressure on connection associated with information flow which facilitates central management with the help of appropriately organized computer networks;
 - particular DLC functions are spread (in the form of monoblocks) beyond intermodal freight reloading (road/ rail);
 - the flow of materials between particular monoblocks is done with the help of specialized internal transport.

An important advantage of decomposed structure of logistics centre is that particular monoblocks can be situated both on the suburbs of city agglomeration and also within the city limits. Whereas high costs of professional internal DLS transport are considered to be the biggest disadvantage.

Taking into consideration the fact that logistics centers play various roles dependent on location, delegated business and operational functions and micro, macroregional or international connections, the following LC can be distinguished⁵:

- international logistics centre with the highest degree of organizational and functional development, which is active on the vast international distribution networks with global range;
- regional logistics centers which are usually an intermediary cell of regional and big-city distribution network;
- local distribution centers which constitute a point of gravity in local/city distribution network;
- industry distribution centers that serve only one particular industry or single large company with specialized production range of products.

Increasing meaning of logistics centers in the national economy is because:⁶

- market of logistics services is growing constantly mainly due to the fact of globalization of the economy,
- there is a growing tendency to outsource logistics services,
- there is a migration of production while seeking new, cheaper resources as well as new markets for products,
- bigger and bigger role of standardization, which allows configuring transport services (e.g. information exchange, usage of Global Positioning System),

⁵ *Centra Logistyczne w Polsce*, AE we Wrocławiu, Wrocław, 2001

⁶ Fechner I., *Centra logistyczne jako czynnik wzrostu efektywności łańcuchów dostaw*, w: *Najlepsze praktyki w logistyce*, Wyd. Biblioteka Logistyka, Poznań 2006, p. 214

- integration of European terminal network, which means regular container shipments according to timetable,
- large asymmetry in European logistics network forces to fulfill gaps in logistics centers network and container terminals in many countries,
- there is a tendency to centralize inventories in one place, what causes increase of transportation tasks, repacking, etc.,
- logistics operators introduce new global logistics strategies, which require large potential and differentiation of logistics services concentrated on junctions in logistics nets.

Location of logistics centers

Location of logistics centers is a significant issue as long as flow of materials and information is considered. It is associated with variety and range of factors influencing the process of decision-making connected with integration of supplier-customer relations. These relations shape significantly problems of location of logistics centers⁷.

The configuration of logistics network is of special importance in distribution of logistics centers. It results from the fact that kind and structure of relations between production locations, kind of transport infrastructure and warehousing is determined in the context of spatial conditions of creating logistics network.

The configuration of logistics network is described by such a structure of points where material goods flow from extraction sources to supply places. Therefore, a number of stop points, location of transport roads and kind of transport are required to be determined in configuration of network.

Logistics centers play an important role in the process of configuration of logistics network. The following methods of location of logistics centers are perceived as relevant:

- method characterized by non-hierarchical cluster analysis,
- Huff model,
- radius describing catchment area.

The first method enables to draw a comparison between spatial developments and identify usefulness of transport and warehouse infrastructure in a country or a region with regard to satisfying customer service requirements. These activities are directed to determine an optimal location of logistics centers characterized by the lowest possible costs of operation.

One of the most important issues in this method is to identify structure of sets where elements are described by individual simple features. A set of units in cluster analysis is defined as an area of points in multidimensional space determined by coordinates. Therefore, a cluster is a part of space with large density of points located side by side in multidimensional space. Features coordinates of these points are similar and form a cluster of points. While this method is being implemented, alternatively voivodeships, districts in voivodeships, or communes in district are taken as basic units. Then these units are described by many variables such as: sales, warehouse area, roads density, state of infrastructure. Based on these calculations, starting from the best up to the worst, some alternative clusters are indicated. As a result, after applying this method, an optimal choice of logistics centre location is performed.

⁷ *Instrumenty zarządzania logistycznego*, Joint work edited by M.Ciesielski, PWE, Warsaw 2006 p. 172-173

Huff method is thought to be one of the most often used models which takes into consideration the law of gravity. One of the indicators of this interest is a simultaneousness of production and consumption of logistics services in a proper time within the given area. This model is especially important for links in a supply chain and for large supermarkets and retail products.

The application of radius in order to describe catchments area is considered to be a simple measure to choose a logistics centre. Then, an area serviced by logistics centre, an area of selected region and the number of receivers serviced within this region are taken into account.

It should be underlined, that a decision concerning location of logistics centre requires applying particular methods, which enable to quantify variables that describe the level of spatial development of the region. Values, which determine supply in demand with regard to logistics service, are significant⁸.

Polish logistics centers

Location of distribution logistics centers in the Polish area should refer to currently existing and expected in the foreseeable future transport corridors, which is associated with international transit routes situated in Poland⁹.

The decision about location of logistics centre should be made after a thorough analysis of the following factors¹⁰:

- costs of labor in the given region,
- costs of warehousing and transport,
- required level of service, i.e. a time from placing an order to delivery of the product to the customer (for instance 24 hours),
- infrastructure (roads with hard surface, railway tracks, inland roads, airports),
- taxes and customs duties.

Research Committee conducted a project associated with location of logistics centers in Poland. This framework indicates six locations, taken into consideration as potential places of establishment of centers. It concerns especially regional distribution centers which would encompass regions¹¹:

- Warsaw and Lodz centre,
- Poznan,
- Katowice and Gliwice,
- Szczecin,
- Gdansk
- located on the so-called "east wall".

⁸ Golemska E., *Przestrzenne warunki lokalizacji i eksploatacji centrow logistycznych*, Joint work edited by T. Markowski, PAN Bulletin no 225, Warsaw 2006, p.33-35.

⁹ Abt S., *Centra dystrybucji a infrastruktura*, Logistyka a Jakość 2/2001 p. 44

¹⁰ Jezusek M., Widem R., *Uwagi do metodologii projektowania strategii centrow dystrybucyjnych*, Logistyka 21/2001 p. 17

¹¹ Abt S., *Centra dystrybucji...., op. cit.*, p.45

Logistics centers are an enormous organizational, investment and technological entrepreneurship with serious, definitely positive consequences and should be included in the strategic program of development of regional economies.

In the Western Europe, there are 120 logistics centers from which the half is united in the frames of European Platform, which coordinate a cooperation of seven European countries (Denmark, France, Spain, Luxembourg, Germany, Portugal, and Italy). In Europe, an initiative of establishing logistics centre comes out from the public sector. National institutions support foundation of the centers.

The realization of the concept of creating logistics centers in Germany is based on the rule of Public-Private Partnership (abbrev. PPP) with clearly divided tasks¹². Public sector is responsible for planning on the commune and regional level and infrastructure financing. On the other hand, private sector is responsible for services offered by transport enterprises, logistics operators, industrial and commercial enterprises serviced by external logistics services providers. Establishment of network of logistics centers in Germany is performed on the ground of German railway plans. Currently there are 32 active centers with different progression of development, from which 18 centers operate together with combined road – rail transport. Typical and average surface of one centre is equal to 125 ha.

Logistics centers in the countries situated in Western Europe became an important factor of economic development¹³. Thanks to them, organization of goods distribution has been improved and capacity of transport corridors has been increased. An Austrian company Rail Cargo Austria¹⁴ can be considered as an example. A company, which is a daughter company of ÖBB-Holding AG, has its own extensive network of logistics centers. There are 17 of them classified into four categories:

- logistics centre,
- logistics centre with so-called “CityBex” services (transport and logistics services in a segment of parcels and general cargo shipments),
- multifunction logistics centre,
- multifunction logistics centre with so-called “CityBex” services (complex of warehouses which realize all modules of logistic chains).

Rail Cargo Austria company invests all the time and develops the infrastructure. A building that is under construction now is very modern, and many innovative solutions have been applied inside of it. The warehouse consists of four storeys:

- I – rail freight reloading front with 7 500 square metres in area,
- II – motor freight reloading front with 7 500 square metres in area,
- III – completion zone with an area of 6 000 square metres,
- IV – storage zone which starts at height of 17 metres, equipped with gravitational flow wall units with rail supporting routes.

¹² *Centra Logistyczne w Polsce*, AE we Wrocławiu, Wrocław 2001

¹³ *Znaczenie europejskich centrów logistycznych dla rozwoju transportu multimodalnego*. Spedycja Transport Logistyka 3/2001, p. 34

¹⁴ Wojciechowski A, Tomasz M.R.: *Centrum logistyczne-mozna i tak*, Logistyka 6/20025045

Thanks to the integrated logistics, the centre represents a large progress in commodities turnover between rail and road transport. This example clearly justifies a statement that running logistics centre is profitable. Maybe this example will contribute to some reflections among Polish decision-makers and executives, and as a result, works associated with construction of logistics centers in Poland will increase its speed.

One of the effects of globalization of economy is an increase in commodities exchange between continents. Because of this perception of economy, activity is an establishment of European Distribution Centers (EDC). They are built for the use of companies acting globally, which is mainly Western European, American, and Japanese in order to efficiently conduct distribution of commodities to all local European markets. Economic analysts claim, that these centers are of multimodal character, because they are cells in which logistics chains from many continents cross. This is connected with exploitation of different kinds of transport (usually sea, air, rail and motor transport). Therefore, these centers are important cells in a combined transport and considerably contribute to growth of this kind of carriage.

An unquestionable advantage of EDC's is that they enable application of the most economically effective kind of transport, which is also associated with activation of the European railway system. These centers are perceived of logistics gate of Europe, because they facilitate and accelerate significantly distribution of commodities in its area. EDC's are important points in world multimodal transport, especially connecting senders and addressees in the Europe and Asia. This is the area where development of new logistics services associated directly with multimodal transport take place. Nowadays analysts claim that EDC's begin a new global organization of distribution and their development will be sustained, among others as a result of unification of European continent, and also as further globalization of global economy advances.

Summary

A creation of homogenous transport network, which would satisfy needs of economic integration with regard to the set and parameters encounter in practice many restrictions. Existing spatial arrangement of Poland hampers drawing optimal from international needs point of view routes of transport infrastructure; parameters and structural solutions of existing infrastructure are a serious barrier of implementing new solutions on the roads of international importance which differ from national network. These barriers can be technically overcome, however it is very expensive – therefore, an economic barrier occurs.

To sum up, full integration of Poland with European Union and location on main routed of commodities flow in Central Europe favor creation of logistics platform with complete infrastructure, which would enable Poland to participate in the global trade exchange. That is the reason why a special attention should be paid to logistics development, and construction of distribution logistics centers located on the main transport routes connected with international transit routes which cover Poland.

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