

## Best practices in managing inland ports in Europe

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**Key words:** inland shipping, inland port, management, best practice, multifunctionality, development

### Abstract

Inland ports in Europe, having undergone transformation for several decades, have become multifunctional economic spaces. Currently, these are not only transport nodes in land-water traditional transport chains but today also supply the locations of intermodal terminals, distribution centers, service and production companies, or technology parks. Multifunctional inland ports also form part of the economic systems of cities and regions, contributing to their development. The aim of this article is to present the best practices in managing inland ports in Europe. In the article, using the results of research on inland waterway transport, it is pointed out what practices in managing inland ports have led, in many cases, to their increased importance in both multi-branch transport systems and the economic development of cities and regions. The study used literature on the subject, specific information on selected European inland ports, and development strategies for selected regions in Europe, including inland waterway transport. On the basis of the above, best practices leading to the long-term development of inland ports and maximizing the added value arising in their areas were determined.

### Introduction

As an element of inland shipping and transport systems, inland ports were created and adequately evaluated with respect to such changing external conditions as technical, organizational, economic, social, and, in recent years, also environmental issues. Just as transport systems evolved in accordance with technical progress, inland ports changed as well, focusing their development on the transport function, with changes related to transshipment and storage techniques (i.e., infrastructure and port superstructure) as well as the organization of the above services / activities. Changes in organization and transport techniques in inland shipping after the Second World War, the management revolution in the 1950s, the development of containerization and network supply chains, and a comprehensive approach to managing the socio-economic development of regions are the key external factors that changed inland ports, which, in many cases, have become multifunctional economic spaces and an

integral element of the socio-economic systems of the regions in which they are located.

The aim of this paper is to present best practices in managing inland ports in Europe, practices that have led to the transformation of many of them from typical transport nodes into multifunctional economic spaces characterized by long-term development and creation of high added value.

Determining the best practices in managing inland ports has been the result of a three-step research process carried out by the author. In the first stage, an analysis of the functioning of modern inland ports with a focus on European ports was made. The second stage of the research process consisted of the processing of the collected material. At both these stages of the research, the author used methods of literature and critical analysis, document research, case analysis, and the observation method, using knowledge acquired during many years of work in the transport sector. The focus of the third stage of the research process was on determining the best practices in managing inland ports that led to

their multifunctionality and long-term development; during this stage, the method of analysis and logical construction, also called the “thought experiment” method, was used.

### Selected definitions of inland ports

Inland ports have different organizations, ownership arrangements, scopes of activity, sizes, and transport links with their environments. Their diversity, and thus the different roles they play in the transport systems, supply chains, or regional development of which they are a part contributed to the lack of a consensus issue among researchers for many years, even regarding the definition of the “inland port” terminology (Rodrigue et al., 2010). Hence, in the scientific literature dealing with transport issues, terms are employed to describe inland ports in different ways, adequate to the perception of their roles within the transport systems, supply chains, and regional development of which they form an integral part. It should be noted, however, that the majority of such definitions regarding inland ports focused on their transport character and roles in transport systems. An example is the definition of Rodrigue and Notteboom (Rodrigue & Notteboom, 2017) in which “*an inland port is rail or a barge terminal that is linked to a maritime terminal with regular inland transport services*” or the following definition coined for the purposes of the PORTOPIA research program: “*Inland ports including at least a ship or barge terminal and with a connection with other ports (maritime terminal or inland port) before they reach the oceanic or sea trade*” (PORTOPIA, 2015). Note that both of the above definitions focus on the role of inland ports in land and sea cargo transport chains.

The development in the last few decades, on the one hand, of containerization and thus intermodal transport systems and, on the other, of global and regional network supply chains led to the development of various types of inland nodes and logistics centers performing various roles in transport and goods logistics. Included in this development were also inland water ports, which previously carried out transshipments only within the land-water system (barge – wagon, barge – car). Intermodal terminals and distribution centers were built in the area of many of these, and water transport connections have been doubled, especially with seaports, through the railway network, where inter-modal terminals of the railway-road-river type provide assurance and timely deliveries within just-in-time systems.

In turn, distribution-center construction has allowed logistics operators to include inland ports in network supply chain systems, resulting in new descriptions or definitions in inland port descriptions:

- Dry Port, in the context of placing in the inland port of intermodal terminals serving intermodal transport vehicles, in particular containers, in rail-road transport (Jarzemskis & Vasiliauskas, 2007; Roso, Woxenius & Lumsden, 2009);
- Hinterland Terminal, where small batches of cargo, including containerized cargo, are transported by road to an inland port, consolidated into larger vessels, and then further transported by trains or barges (Wiegmans, Masurel, & Nijkamp, 1999); and
- Inland Freight Terminal – any transport hub, including an inland port, other than a port or airport, operated on a joint user basis, in which international cargo is picked up or sent (UN ECE, 1998).

The various inland port types described above clearly refer to their roles in transport systems, in particular in intermodal transport. These terms also indicate one of the main directions of development of modern inland ports both in Europe and on other continents.

Specifically, the above definitions of inland ports and the concepts defining their roles within transport systems and supply chains point to two basic directions of their development. However, the third direction should be mentioned at this point, i.e., the role of inland ports in regional development, where the port area becomes a component of the city / agglomeration and urban logistics system of which it is a part.

### Key factors characterizing inland ports

Inland ports operating in Europe represent a different level of development, different organization, spatial layout, or ownership arrangement than those operating on other continents. Therefore, this study identifies several factors that allow initial characterization of each inland port, the key factors among these being the following: the object of trade, transport accessibility, spatial layout, ownership arrangement, multi-entity character, functions, and organizational correlation with other economic structures. Table 1 presents the key factors that build the characteristics of a given inland port in terms of organization and scope of activity.

The evaluation of the functioning of selected European inland ports located on the main waterways, including the Elbe, Skalda, Rhine, and Danube

**Table 1. Key factors characterizing the inland port**

Key factor			
Object of trade	Passenger	Cargo	Universal passenger and cargo
Transport availability (mode of transport)	Inland transport Road transport	Inland transport Road transport Railway transport	Inland transport Road transport Railway transport Maritime transport
Spatial layout	Clustered	Dispersed	
Ownership*	Private	Public-private	Public
Single/Multi-entity	Single-entity	Multi-entity	
Activity functions*	Transport	Transport and Industrial / Transport and Distribution or Logistics and Distribution	Transport Industrial Distribution or Logistics and Distribution
Spatial functions*	city-forming urban	city-forming urban region-forming	city-forming urban region-forming regional
Functional correlation with other economic structures	Independent economic organisms	Elements of integrated logistics centers	Elements of urban logistics and the social and economic system of the agglomeration

**Legend**

Functions – the author has applied systematics identical to those for seaports to evaluate a number of aspects of their functioning and development (Beresford et al., 2012; Montwiłł, 2016).

rivers and channels linking the aforementioned rivers, has led to the formulation of several conclusions:

1. There are inland ports of different sizes and different characteristics operating in Europe. From small, private, single-entity ports with one wharf of a key transport function (Bydgoszcz port – cargo turnover of several thousand tons per year, mainly aggregate) to public-private multi-stakeholder ports with a management entity and developed objective and spatial functions (Duisburg ports – 131 million tons in 2017) (Duisport, 2017). The two extreme examples illustrate the scale of the diversity of inland ports in Europe.
2. In contrast to European seaports, mostly public-private (subject to specific rules of separation of spheres of management and exploitation and restrictions on the flow of public money between spheres), inland ports in Europe operate on very different principles, where their legal shape is decided by individual states or also local governments, and financial flows between the public and private spheres are not covered by EU restrictions. An example are ports owned by inland shipowners that are owned, in turn, by the public sector.
3. A significant number of European inland ports have become the place where intermodal terminals and cargo turnovers are located in railway-car-railway relations, thereby bypassing inland waterways. This characteristic applies particularly to inland ports with an internal railway network connected to the system of national

and international railway infrastructure. Examples include the following: port in Gliwice (SCL, 2019), port in Vienna (Hafen Wien, 2019), or the port in Mannheim (Hafen Mannheim, 2019).

4. Inland ports with an area of at least several dozen hectares, having intermodal terminals, located within large urban agglomerations, have become an element of urban logistics and the location of office centers and distribution centers. Thus, these types of ports are today a component of agglomerations with developed functions: transport, logistics and distribution, urban-forming, urban, region-forming, and regional. Examples include the previously mentioned port of Duisburg or the port of Basel (Port of Switzerland, 2019).

The characteristics of European inland ports included in this study showed their large variety. Nevertheless, thanks to the proposed key qualitative factors, each of them can be pre-characterized, and the features of each can be deepened by means of quantitative factors thanks to which determining the technical parameters of each port and the size and structure of its passenger and freight turnover is possible.

### Directions of inland port development in Europe

The current shape of inland ports in Europe has been affected by several key economic phenomena that have occurred over the last two centuries. Three

of them were particularly important for the development of inland ports in Europe. The first was the Industrial Revolution, the second was containerization, and the third was the emergence of global and regional supply chains.

The Industrial Revolution, associated primarily with the period at the end of the eighteenth and the beginning of the nineteenth century, when in a few leading European economies (Great Britain, Italy, or Germany) an industry using new energy sources based on the combustion of hard coal and steam developed. In place of stone and wood, steel and new building materials, such as Parker cement, became widely used (Werner, 2019).

The consequence of the modern Industrial Revolution that began at the turn of the eighteenth and nineteenth centuries was a revolution in transport, including inland waterway transport. The use of a steam machine for the propulsion of inland vessels as well as steel for their construction allowed the development of passenger and cargo shipping on a significant scale. This was accompanied by the expansion of inland waterways, especially in Western Europe, where in addition to adapting the rivers to a new type of vessels, the shipping channels connecting individual rivers to the inland waterway system were built. The increase in industrial production, in particular in mining, metallurgy, and construction, stimulated the creation and development of inland ports, which, in transport systems, became transport hubs that, in many cases, had a developed infrastructure not only for inland but also rail transport.

It must be remembered that the steam engine has also contributed to the creation of a new branch of transport, the railway, and its dynamic development, both in the area of passenger and freight transport, where the main loads were dry bulk cargoes. Thus, already in the nineteenth century, both modes of transport competed for the same commodity but also became the basic transport branches in intra-European transports creating jointly water and land transport systems. Already at that time, transportation systems were established from and to seaports located at the mouths of large rivers, where bulk goods were transported to the facilities both by inland transport and by rail. Coal, iron ore, construction materials, and steel products were transported to and from emerging industrial centers, which were often located at water – and the river is water. Therefore, when analyzing the location of inland ports in Europe, it can be concluded that many of them are located in industrial areas. An example are several dozen ports on the Rhine, the Danube, or a network of canals in Western

Europe. A similar phenomenon can be classified in the case of Eastern Europe, where the river system is not so much supported by a network of channels as is the case in Western Europe; nevertheless a number of inland harbors are located in industrial areas. The creation and development of these ports was associated with the traditional mining industry or heavy industry (nineteenth and twentieth centuries), where dry cargo and metallurgical products were key loads. Due to the fact that they were exported or imported into given industrial areas by inland or rail transport or in a multi-branch system (railway-barge), inland ports became a place of transshipment, concentration (transshipment and storage), and distribution of cargo. The proper quantity and quality of cargo and means of transport (wagons, barges) required the construction of an infrastructure and superstructure system (spatial segment) with specified performance and size parameters and functional segment (trans-shippers, freight forwarders, transport companies, agents, inspection companies, customs and phytosanitary institutions, service and supply companies). As a result, economic organisms capable of handling large cargo streams and large amounts of means of transport were created and were of considerable importance for the further development of inland ports in the context of subsequent industrial revolutions that the world has experienced since the beginning of the twentieth century (Kozłowski, 2015).

The second key factor that influenced the current shape of inland ports in Europe was the process of containerization of cargoes in land and sea transport systems and the related development of intermodal transport. The introduction of a standard ISO (International Organization for Standardization) class container for transport (Wiśnicki, 2006) is considered a revolution in the transport of loads. By Bernhofen, El-Sahl, and Kneller, the subject literature on transport economics clearly indicates that containerization of loads, which began in the 1960s, was the main factor responsible for accelerating the globalization of the world economy (Bernhofen, El-Sahli, & Kneller, 2013). By significantly reducing transport costs (Bernhofen, El-Sahli, & Kneller, 2013; 2016; Cosar & Demir, 2017), it was possible, among other things, to increase the range of goods deliveries while maintaining the price level for buyers and to reduce shipments of loads sent even up to several tons at a distance of several thousand kilometers, thus leading to the allocation of production to those regions of the world where its costs were significantly lower than before. Despite a considerable

distance of the place of production from the place of consumption, this, in turn, allowed successive reductions of product purchase prices at their points of consumption.

The transport of containerized cargoes started in the 1960s, leading to the creation of a new transport system, one that required new technical, organizational, and legal solutions. As a result, in the 1960s, 1970s, and 1980s, a global intermodal transport system was established, with maritime transport (sea shipping and sea ports) playing a key role worldwide, with its nearly 90% share in the global commodity exchange (Ducruet, Notteboom, & de Langen, 2009, p. 12) and road, rail, and inland transport joined together in a multi-branch whole by intermodal transport terminals on the continental/regional scale. Figure 1 presents a diagram of land and sea intermodal transport chains in Europe, illustrating the complexity of the container transport system.

Research papers on intermodal transport often use one term for such a variety of economic structures – a dry port. Therefore, as indicated in the initial part of this chapter, inland ports are also defined as dry ports due to the intermodal terminals located within their area, where container transport is carried out in both barge-car / car-barge relations as well as in relations truck-car-truck.

A characteristic feature of the presented system is its multi-branching, where the transport of containers from and to seaports is carried out via various modes of transport (road, rail, and inland), and the change of means of transport through the container

is carried out in a network of intermodal terminals. These are located close to industrial and distribution centers and metropolitan areas, thanks to which it is possible to implement deliveries in the JiT (just-in-time) formula. The terminals operate as independent economic structures or are part of larger structures such as logistics centers and inland ports (see Figure 1).

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As indicated earlier, the development of inland ports was related to the development of industrial areas, and their technical and organizational potential allowed for servicing large cargo streams and significant amounts of transport means. Changes in the production structure in Europe, related to the reduction of heavy industry based on raw materials and semi-finished products and the development of highly processed production, have unleashed the technical and service potential of many inland ports, both in the spatial (land and infrastructure) as well as functional segment. The surplus potential thus created allowed inland ports to join in the changes taking place in the structure of industry and services in Europe. Due to the location close to industrial

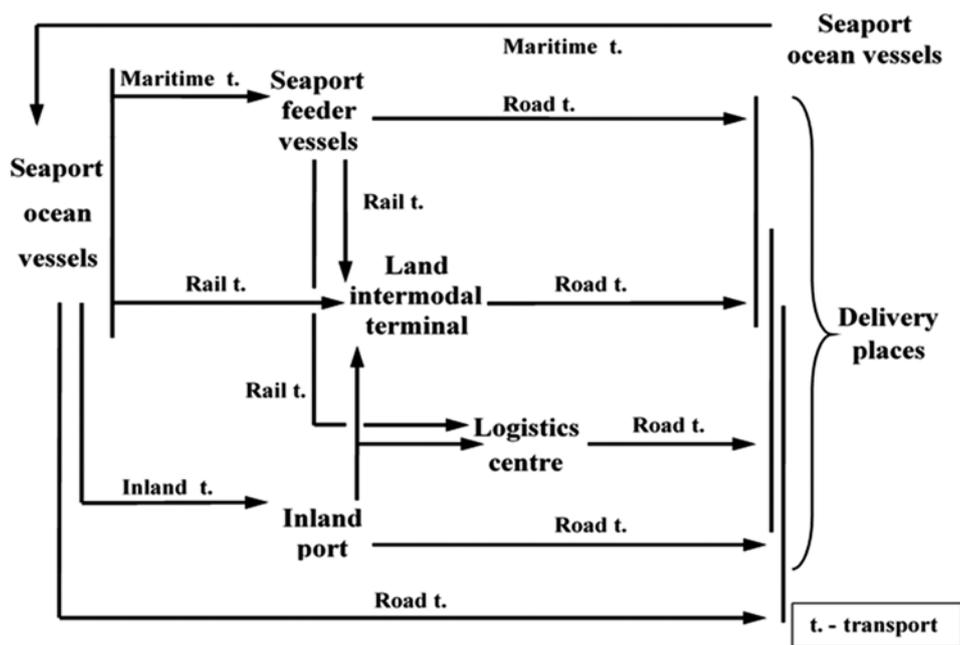


Figure 1. Land and sea transport chains of containerized cargoes in Europe (own study based on (Wronka, 2002))

centers and metropolitan areas, inland ports have become a natural element of the intermodal transport system, with extensive container terminals and a functional segment capable of handling containerized cargoes. Currently, the largest number of inland ports of this type is located on the rivers Rhine and Danube, a natural consequence of the level of economic development of countries located on the indicated rivers. Inland container ports also operate on the Elbe, rivers of Eastern Europe, and shipping channels connecting rivers to larger systems. In Poland, where in practice long-distance inland navigation does not work, an example of using the previously created potential for handling cargo and the means of transport is the inland port in Gliwice. The Śląskie Centrum Logistyki SA operating on the basis of its potential is part of the intermodal transport system, where the operator CCC Intermodal SA operates an intermodal terminal that carries container transport in a car-wagon-car relation. Thus, the inland port acts as a dry port.

According to the author, the third, key economic phenomenon that affected in particular the current spatial and functional structure of inland ports in Europe was the creation of network supply chains by the business sphere. According to Bazarth and Handfield, “the supply chain is a network of manufacturers and service providers who cooperate to process and move goods – from the raw material phase to the end user level. All these entities are connected by physical good flows, information flows and cash flows” (Bozarth & Handfield, 2007). Their creation is a result of the globalization of the economy and the development of global logistics. As indicated by Gołemska, the development of international logistics has increased the efficiency of supply chain management, where the flows key to their effectiveness are the flows of goods, financial resources, and information between the partners in a given supply chain (Gołemska, 2009). In the above context,

a very important task of logistics is the optimization of processes of goods delivery carried out as part of supply chains at individual stages (see Figure 2 below).

Optimization of supply processes at individual stages of complex production is the task of delivery logistics, which consists of supply logistics and distribution logistics, where the key areas of activity are as follows:

- marketing, including commercial customer service before physical distribution;
- organization of supply processes, including supply and distribution channels and their management;
- physical delivery, including transport, storage, and logistics services; and
- logistic customer service including a number of activities related to its service in the physical delivery process and after delivery of the product to the customer.

The above actions together create a system of delivering goods to the customer, which may be both the supplier of a specific order, the final producer, or the final recipient, including the consumer.

The development of logistics as an element of global and regional supply chains has led to the creation of complex supply and distribution systems, the implementation of which is the task of the enterprises of the TFL (Transport Freight Logistics) sector. As indicated above, the elements of supply logistics are transport, warehouse management, and logistics services, if transport is a transport company, reloading, forwarding, agency, control, and other service companies and if warehouse management is warehouse centers, logistic operators, customs and phytosanitary institutions, insurance companies, and banks. Together, these form a network functional structure, whose effectiveness of operation depends both on own resources and external resources, in this case, the technical infrastructure, including (linear and nodal) transport.

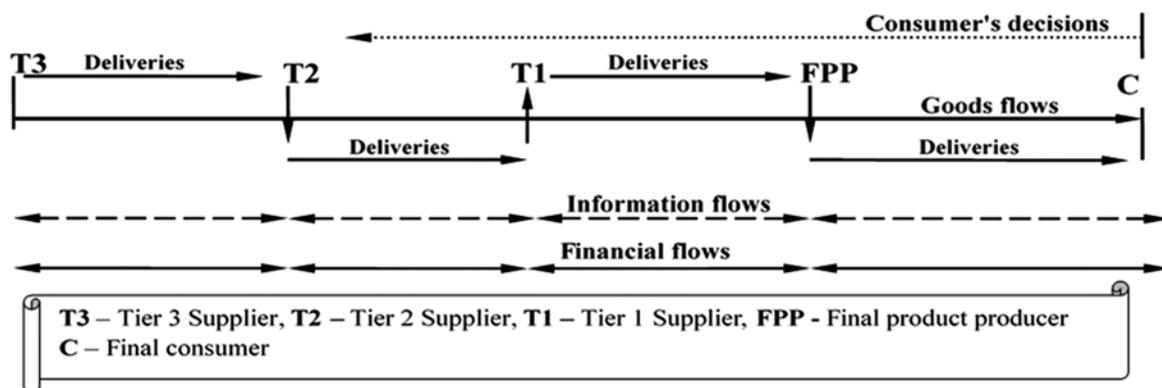


Figure 2. Diagram of the supply chain in complex production

As previously indicated, the spatial segment of the inland port is a collection of land real estate and point infrastructure, creating a transport node connected to the environment by a network of linear infrastructure. Its functional segment is made up of enterprises from the TFL sector and institutions (necessary to carry out transport processes in international transport). With a certain technical and executive potential, a number of European inland ports also developed services related to warehouse and supply management, in response to the development of supply chains and global logistics. Reloading and storage companies operating within their area, freight forwarders, and logistics operators have become partners in supply chains, developing the potential for the handling, storage, and distribution necessary for the logistic handling of loads in procurement and distribution processes. Due to their location close to industrial areas and metropolitan areas, inland ports have naturally developed a logistic and distribution function, adequately to seaports, becoming logistic centers providing a number of transport and logistics services for cargo and the means of transport.

### Best practices in managing inland ports

The Industrial Revolution occurring at the turn of the eighteenth and nineteenth centuries, which initiated further socio-economic revolutions, containerization, and the creation of supply chains in the global economy, was a key economic phenomenon that influenced the level of development of inland ports in Europe, which was the result of an approach to changes in the environment and management decisions of owners and users of these ports. Therefore, as demonstrated in the research process, inland ports on the Old Continent are characterized by diversity in terms of the ownership arrangement, transport accessibility, spatial layout, multi-subjectivity, subject of trade, and functional correlation with other economic structures and functions performed. Extreme examples include the following: an inland port in Dresden on one pole, which consists of several piers on the Elbe river that allow entry and exit of passengers from cruise ships, and, on the other, a multi-entity and multi-functional inland waterway team in Duisburg, mainly handling cargo, where transshipments of containers themselves have exceeded 2018, 4 million TEU (twenty equivalent unit) (Duisport, 2019).

In the research process, the benchmarking method was employed to analyze the functioning of several dozen inland ports, the literature on the subject,

the results of other research, the professional experience of the author, and commonly available information and data on the functioning of the analyzed ports. The collected material and its analysis allowed the best practices in managing inland ports in Europe to be determined, the application of which translates into long-term development of ports and their importance in the region's socio-economic development (see Table 2).

**Table 2. Best practices in managing inland ports in Europe**

The key factor	Best practice
The ownership system*	Public-Private
Transport availability (mode of transport)	Inland, Road, Rail transport – Multimodality
Spatial layout	Dispersed
Multi-entity	Multi-entity
Trading products	Cargo
Functional correlation with other economic structures	Element of the regional socio-economic system in the network system of production centers / distribution and urban logistics
Activity functions*	Transport, Industrial, Logistics and Distribution
Spatial functions*	city-forming, urban, region-forming and regional

\* The author used the same systematics as for seaports, which this is used to assess a number of aspects of their operation and development (Beresford et al., 2012; Montwiłł, 2016).

Table 2 presents the best practices in managing inland ports in Europe. The adopted methodology is based on the key factors characterizing a given port defined in the research process, thereby making it possible to refer best practices in managing their development to the key factors that define them. Table 3 presents the best practices in managing inland ports in Europe, along with an indication of their importance for the development of an inland port.

The application of the best practices defined in the research process in the management of inland ports leads to their long-term development and significant importance in the socio-economic development of the region. Examples are the Port of Duisburg (as discussed in this article), the Nuremberg port being part of the second largest integrated logistics center in Europe and part of the Bayernhafen Gruppe logistic platform, which was described in one of author's previous articles (Montwiłł, 2016). Another example is the port in Vienna, which is both an element of Vienna's urban logistics, intermodal transport system as well as an element of the network system of supply chains in the areas of warehouse

**Table 3. The importance of best practices in managing inland ports in Europe for their long-term development**

Best practice	Importance for the port development
Public-private partnership (PPP)	The simultaneous involvement in the development of an inland port of public and private sectors allows for a balanced distribution of the goals, advantages, and disadvantages of each. The public sector usually represents a city within the functional area of which an inland port is located. There is also the involvement of regions (Länder, provinces, cantons, etc.). Organizational and financial involvement of the public sector, the goals of which include not only business but also social aspects, is primarily aimed at the construction of technical infrastructure, including transport infrastructure, and the inclusion of the port organism in the socio-economic system of the region. Public, developed technical infrastructure, and principles of local business rules are the basis for business development by the private sector, which, by representing a business approach, invests in buildings (warehouses, production, reloading, and storage), transport and transport superstructures, thus creating jobs and influencing the socio-economic development of the region.
Multimodality transport accessibility	Involvement of the public sector related to the development of infrastructure, ensuring that access to the inland port is a key activity of the sector conditioning its long-term development by including it in transport systems of various scales. The multi-branch transport accessibility allows inland ports to be part of complex transport systems, in particular intermodal transport. Therefore, accessibility for inland, road, and rail transport is the key to the development of inland ports. This allows for transport in both water-to-land and land-to-land systems, thus including the inland port in a system of network supply chains or urban logistics.
Dispersed spatial layout	Construction and development of an inland port in a dispersed system allows, on the one hand, the full exploitation of the potential of riverside areas without excessively expending the port inland, and, on the other, locating its part within or outside the agglomeration depending on whether the functional segment's scope port area is included in urban logistics or not. The areas of the inland port located in the area of cities are usually surrounded by their buildings, meaning that the movement of large streams of cargo in transit through the city contributes to the build-up of congestion and, consequently, to increased transport costs. Therefore, it is optimal to locate handling and storage terminals that generate large cargo streams and industrial enterprises in port areas and so ensuring access to them while bypassing built-up areas.
Multi-entity	The implementation of a wide range of services and production activities in the inland port area requires an expanded functional segment with a division into the sphere of management and the sphere of exploitation (and production). As indicated earlier, one of the good practices in managing inland ports is the PPP format, where the sphere of management is the domain of the public sector and the sphere of exploitation is the domain of the private sector. On the other hand, the appropriate quantitative and qualitative service of cargo and means of transport (cars, wagons, barges) requires a developed functional segment (port operators, freight forwarders, transport companies, agents, control companies, customs and phytosanitary institutions, service and supply companies) of the inland port.
Cargo as the basic trading product	Unlike passenger service, where the range of services comes down to several services, cargo handling in inland ports can include several dozen different activities / services and thus create high total value added (VAL + VAF + VA) (VAL – value added logistics, VAF – value added facilities, VA – value-added in production processes). The range of services depends on the degree of development of the objective functions of the inland port, where various processes are carried out for cargo, means of transport, and transport units.
Activity functions	As in the case of seaports, the inland port activity can be divided into several functions, i.e., transport, production, and logistics and distribution. As part of the transport function, processes for cargo, means of transport, and loading units are carried out related to the reloading and storage of cargo and loading units. The production function includes the processing of goods at various stages of complex production. In turn, transport and logistics services for cargo related to warehousing and supply of goods are implemented as part of logistics and distribution functions. The wider range of processes implemented within individual functions, the greater the total added value created in the inland port space and the greater the port's ability to develop over the long term.
Spatial functions	The PPP format means that the public sector is interested in the development of the inland port as an important element of the development of the social and economic system of the city and region. As a result, the port begins to affect the development of its surroundings, leading to the development of its spatial functions, where the port contributes to the development of the city and region (city and region-forming functions), and becomes an important element of the processes implemented in the agglomeration and region (urban and regional functions).
The element of the regional economic system	The PPP format leads to the inclusion of an inland port into a network of production and/or distribution centers, or the urban logistics system, or the port itself becomes the center of economic activity with economic development concentrating around ( <i>examples of the above solutions were presented under the Table</i> ).

management and supply. Another example of a set of ports (under joint management) in Basel, Mulhouse, and Weil (RheinPorts, 2019), which are part of an economic platform consisting of short-distance industrial and technology parks grouping companies

in the following sectors: pharmaceutical, chemical, automotive and high technology, and enterprises and institutions of the R&D sector. These ports are also part of the urban logistics of the cities in which they operate (RheinPorts, 2019).

## Conclusions

Inland ports in Europe represent a different level of development, which translates into their importance in transport systems, supply chains, or regional development. In the research process carried out by the author, the best practices of inland waterway management were determined, indicating their long-term development and significant importance in the socio-economic systems of the regions concerned. These practices include, among others, the public-private partnership, which allows for cooperation between the public and private sector, resulting in a balanced distribution of the goals, advantages, and disadvantages of each sector. The best practices also include multi-entity characterization allowing for the creation of a network system of institutions and enterprises cooperation in cargo-handling processes, the means of transport, and cargo units, where the inland port potential allows for the implementation of a range of activities / services in transport systems (including intermodal transport), supply chains, and municipal logistics. The form of summarizing the research work was the identification of dozens of inland ports in Europe, which are managed in accordance with the best practices defined in the research, which, in turn, translates into their long-term development and significant importance in regional development.

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