

# LOGISTIC PLATFORMS AND TRANSFER POLES: BETWEEN CONFORMATION AND UTILITY

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**Abstract.** Considering the current trend in sustainable regional development, transfer nodes and logistic platforms represent an essential component of the transport systems, while playing an important part in the distribution of merchandise at a global level and having a binding role in the current urban and regional system. At the same time, these are relevant segments for a functional regional economy. Moreover, optimizing the transport systems for freight distribution, will allow further regional and territorial development. Any changes implemented in the existing transport systems will most likely affect the companies that take advantage of that infrastructure, generating either growth or shrinkage in the local GDP.

**Key words:** transportation, freight, distribution, cluster, regional, logistics;

## 1. Methodology, foreword

This paper proposes a structure with several levels of analysis. It initially starts with the description of system components, following the relationships between them and ultimately showing the global implications. The study has the following pattern: elements → relations and connection between the elements → implications.

On this initial form, several features are grafted. The elements are represented here by transfer poles and logistic platforms, the relationships between elements depict internal or external linkages, whereas the implications are discussed from a wider political and governmental point of view. The paper

starts with the premise that merchandise mobility is a key factor in economic development and the main question is how a functional transport system is able to influence the local and regional economy and what regulates that connection. This study is drawn as a literature review about freight and its main components.

## 2. Economy and transport systems

General economic development is linked to the transitions of passenger mobility towards motorized transportation. The initial stage involves the development of collective forms of transportation (tramways, buses, etc.) while individual mobility becomes more affordable. The economic importance of transport industry

can be assessed from a macroeconomic and microeconomic point of view.

First of all, at the macroeconomic level (the importance for the whole economy) transportation and the mobility it implies is linked to employment and income within national economy. Transportation accounts for between 6 and 12% of GDP. (in developed countries).

Second of all, at the microeconomic level, transportation is linked to the producer, the consumer and the production costs. Therefore, the importance or specific transport activities can be determined for each economical sector (e.g., transportation accounts for 4% of the total cost of production in manufacturing) (Rodrigue *et al.*, 2006).

The current paper focuses on microeconomic aspects, detailing freight distribution systems (as part of a general transport system), components and internal processes.

Furthermore, it is implied that the distribution of merchandise is highly influenced by infrastructure. Under that premise, any changes made in the preexisting transport system will allow further improvements of the stakeholders (in this case the companies and corporations) who gain benefit out of them. In order to have a fully functional transport system it is necessary to dimension and organize the components to sustain the overall flows.

The components of transport systems are roughly the following: terminals (either for passengers or for freight and adjacent elements) and specific infrastructures (roads, highways and ports/airports). We will go into further study with the freight terminals, underlining that there are certain categories that have a higher impact over the functionality of the system: the logistic

platforms and the transfer poles. We know much about logistic platforms, and there is clue about their influence over the regions they are developed in. However, there is no accurate data to sustain certain growth patterns for areas sustained by those elements. In that same note, there is scarce information available for the hypothesis of freight-developed areas, which are relevant for balanced polycentric systems.

Transfer poles are not specifically defined, being a rather new notion, but they are functionally present in the making of freight transport systems.

### 3. System components

#### 3.1. Logistics platforms

At the micro-territorial level, the distribution of merchandise in urban areas is essential to the lives of the inhabitants of a city and to the proper development of economic activities. This mediator's complexity is due to the large sphere of activities involved but also to the high number of restrictions.

Conceptually, a logistics platform can be defined as a specialized area with a dedicated structure (inside the system or independently) that has elements which facilitate multi- and intermodal transport. Its composition includes: storage areas, multifunctional areas, infrastructure – transport terminal mixed profile areas and dedicated infrastructure adapted to internal requirements (of dimensioning and spatial conformity). From a theoretical point of view, a logistics platform is an ensemble of components that allow economic and transport activities, being an intermediary adjustment mechanism in the “product transfer and transport chain” (McCalla *et al.*, 2001).

In the context of an economy oriented towards consumership, nodes and logistics platforms tend to migrate from production areas to large urban agglomerations (that

serve as reference points and have a higher economic role), that are connected to some strategic communication areas (maritime and river areas).

Location is an essential aspect for the functionality and configuration of a logistics platform. The regional context is indirectly generating further growth potential because it means laying the bases of the site articulation mechanisms for the circulation of economic goods.

### *3.1.1. Logistics platforms – typology and classification*

Five coordinating dimensions are distinguished at this level: *means of transport* (uni-, bi-, trimodal), *functionality* (gateway: merchandise access area, continental harbor, logistics cluster area and terminal satellite; the specialization degree indicates an increase in the transited products' added value), *dimension*, *geoposition* (access to an ocean, sea, water, intraterritorial), and *handling* and activities related to the handling of the conveyed resources, which in turn can generate a potential of polarization and of developing logistics poles as generative elements in the platform network (ESCAP, 2009).

### *3.1.2. Spatial adaptation - internal and external conformation models*

A network of logistics platforms is classified according to localization premises, complexity and regional position.

As such, a first category of platforms is related to the maritime area, being generally referred to as port terminals. These are the most complex units in the territory and represent the flow distribution and reorganization points, permitting the shift from the naval transport system to the rail or road one. A second category of logistics platforms is linked to the intraregional port areas, and contains a series of composite

terminals, with both port and rail adaptations.

Distribution centres represent a third category of logistics platforms with transfer pole characteristics. They fulfill three main logistics functions: deposit or transfer, adaptation from one transport system to another and product management, labelling, assembly, customization etc. All these activities generate added value to the processed goods and indirectly generate development on the long run (Rodrigue and Notteboom, 2009). The management of the platforms differs according to the strategies pursued and the characteristics of the distribution points.

### *3.1.2.1. Logistics platforms –internal conformation*

Logistics platforms are large dimension ensembles (approx. 30-400 ha), with a 40-50% general percentage of area occupation. Generally, a multifunctional storage sequence is added next to the infrastructure transport section.

This includes, first of all, specialized storehouses, according to the type of stored product (dry, liquid, frozen) or to the size of the enterprises situated downstream (storehouses that service large or small; Second of all, they contain polyvalent storehouses that group varied types of products and deliver them to the preliminary distribution points.

In the same manner a logistics platforms are organized considering the nature of the flows' pilotage. Dimensioning the plots is not easy, considering that the profile of consumption is not steady in time and does not correspond to a statistical distribution that has fixed parameters from the start.

That is why several product classifications have been created, according to their

destination and organization in time, to lot and commercial use (promotional products or for speculative stocks, fresh products or with a very short marketing and commercial life cycle, low value products, products with a stable consumption profile, products with slow rotation, season products etc).

At the same time, choosing the number of storage houses or distribution centres depends on the geographic diffusion of the distribution points. Practically, in the internal organization of a dedicated logistics platform the external organization and transport chain are taken into account. Resupplying these points depends on the distance between the distribution centres and distribution points (e.g., restocking is done in less than three hours for dry products and in one and a half hours for fresh products).

#### 3.1.2.2. External conformation (networking)

Regarded as networks, logistics platforms serve the purpose of connecting, organizing and facilitating the transportation of goods. Several types of connections exist at this level, regarding the management of resources and the intermodality of the transportation types in the territory (Rodrigue and Notteboom, 2009).

In the organizational part of platform networks the relations with the territory and resources are also put forward. The elements that comprise the system will regard areas with heightened access and distribution potential, the accessibility of those network elements being a key factor in their performance.

The functionality of a platform network is strictly related to the regional context. It tends to work better when positioned at the intersection of important transport axes (Roman, 2006).

Furthermore, in time, a new approach to spatial distribution of logistics platforms has been developed. The integrated logistics centre was conceived to ensure an increased regional commercial and logistical productivity (Hesse, 2003). Concurrently, in the EU member countries a development policy is necessary and practiced at this level (e.g. Germany), seeing that the territorial organization and localization of logistics platforms can generate regional or local development.

At the same time, the economic effects of the platform networks' development are tracked, seeing as they can engage other connected mechanisms (social, environmental etc).

#### 3.1.3. Effects in the territorial context

In order to identify solutions that lead to efficient urban freight systems it is necessary to estimate effects by elaborating a set of models:

- a. models for the delimitation of logistics areas;
- b. models for the placement of the distribution centres;
- c. analytical and simulation models for the dimensioning of the logistics centres;
- d. models for the optimization of the transport routes;
- e. models for the planning of vehicles;

There are several evaluation models for new logistics platforms, based on the volume of traffic in a region (divided into traffic areas), on the number of inhabitants, on the number of employees and on the number of companies that transport goods, spatially adapted logistics schemes are identified.

For a given situation of traffic, with the help of the developed models, the effects for each proposed logistics platform scheme can be assessed (Stet, 2012).

The final results of the models must lead to the estimation of urban congestion, by knowing the conditions of loading the road network in each area, and to the finding of a minimum consumption of energy by knowing the transport activity (expressed in vehicles/km).

The set of development models will permit simulating the effects of applying the different control instruments and modifying the adopted solutions in developing the logistics infrastructure. Based on the synthesized assessment reports conclusions can be drawn regarding the appropriate logistics scheme for each urban area, the use of different categories of vehicles according to the field of activity, the restrictions imposed on categories of vehicles in each area, and the situation of transportation according to the fields of activity (in time intervals).

Large commodity platforms situated on the outskirts of cities impact urban traffic when they are connected to smaller, urban terminals. Urban terminals decrease distances travelled by distribution vehicles in the urban space and, implicitly, in the already over dogged urban traffic. At the same time, the UT increase the efficiency of urban deliveries due to the grouping of commodities according to destination or delivery areas. Access restrictions imposed on vehicles with large capacity in the urban environment generate a negative impact on urban traffic by redistributing the load on a large number of vehicles of relatively small size (Costescu, 2009).

#### *3.1.4. Conclusion and synthesis*

Based on the analysis and a preliminary highlighting of the main characteristics logistics platforms have, a conclusion module can be achieved, which shows their territorial relevance and the specialization degree.

To that effect it is obvious that logistic platforms benefit from a well-adjusted transport system that services a large range of distribution points. The platforms are usually resupply points for distribution points located in the cities. At the same time, logistic platforms establish a connection with the transfer poles, both being intermediary transit points in the commodities' shipping process.

These logistics areas are intermediary transfer terminals in which the dominant activities are connected with transportation and pre-packaging. The platforms are usually endowed with a number of facilities that help the course of the internal management of the logistical activities.

#### **4. Transfer poles**

Transfer poles are reference elements in the territorial context. They serve the in the process of quantity transformation of products that come from outside the sales areas (in large packages), in distributable products by using low volume means of transport. Their importance in context is represented by the existence of permanent transit, being the headquarters for distributors.

The transfer poles are characterized by intense processing and manipulation of goods. For that matter, these areas are aggregations of activities connected to the transit of products: warehousing, storage, manipulation, etc. At the same time, these points are supported by different areas that serve in deposit purposes, by miscellaneous spaces that contribute to the coordination and distribution of merchandise, by customs and control areas.

Around the transfer poles, several other activities are present: inlaid production,

assembly or preliminary assembly areas, multifunctional spaces with technical and administrative profile. The advantages of transfer poles in regional development are related to human capital and workforce, both being key indicators in a balanced economy climate.

#### *4.1. Transfer poles typology*

A preliminary classification of transfer poles can be done according to their territory spreading. These points can be dealt according to the managed quantity of goods, the facilities and specific internal organization pattern. To that effect, two large categories of transfer areas can be distinguished: national and supra-national, both being linked to an endogenous and exogenous orientation of goods distribution and transport.

Besides this preliminary classification, there are some logistic areas with miscellaneous transfer properties. They are usually company exclusive deposit and unpacking areas.

#### *4.2. Spatial adaptation - internal and external conformation models*

On a supranational level (international, continental, regional-European) in the context of logistical distribution the main topic is transfer poles. They generally run on a bigger scale and they handle a greater volume of merchandise. These elements are the starting point in the spatial - administrative configuration of the transfer poles and practically main characteristics of transfer poles.

The activities and areas determined in the transfer zone refer to depositing, adapting and reconfiguring the flow of goods. The connection with the existing infrastructure occupies a secondary place (airport, marine terminal, port, the vicinity of a motorway, a commercial and

high speed train station) in defining a transfer pole. At the same time, the connected areas are part of the main configuration of a transfer pole network; Transfer poles might be implemented at a national or even regional scale, being the key element in regional territorial development policies.

As for the internal configuration, transfer poles are much alike the logistic platforms, the only difference being vaguely related to the activity management and product volume. For that reason, it is safe to say that those elements are multifunctional and bound to be versatile due to their polyvalent nature. In any case, the poles contain areas designated to sustain and to efficiently develop freight. The most relevant functional aspects here are: depositing in open and covered spaces, logistics services, satellite monitoring of the transports, telecommunications, services for transport and adjacent activity areas (offices) (Hesse, 2003).

#### *4.3. Conclusions and synthesis*

Transfer poles are flag elements for the territory and are being taken into account only in a larger context or as constituent part of a more extensive system. The terminal network and the transport infrastructure is part of the transfer pole system. At the same time, the poles are also determined by spatial conformation elements (the size of the sites themselves with the specific economic functionality) and the adjacent territorial ramifications (economic clusters, if they exist - or other areas that work in parallel).

Transfer poles are closely related to the logistics platforms, because both of them represent an inflexion point in the transport and goods distribution process at the global level.

### 5. Comparative - relational study between logistic platforms and transfer poles elements.

The starting point in analyzing the relation between logistic platforms and transfer poles is the means of distribution in the territory. As such, if a logistics platform is a distribution point, a transfer pole is a means to adapt a large magnitude flow of goods, in order to further distribute in the territory.

This logical succession of elements with a relatively well determined spatial conformity serves the purpose of obtaining a functional global distribution system, with minimal losses resulting from transport and the maneuvering of the goods (this can be one of the main objectives in configuring transfer networks and logistic platforms).

As was mentioned before, it is possible to understand logistics platforms in correlation with transfer poles if redistribution at a local level and a distribution of the flow of goods are performed.

At the same time, transfer poles serve the purpose of adapting to consumerist requirements the flow of goods and sending it in an optimised manner in the territory, whereas platforms are areas specially oriented toward receiving, organizing, distributing and coordinating. Most often, they work efficiently because they are laid out together.

The clear difference between these two types of organization is the dimension of the sorting and redistribution areas; practically, the activity area in a transfer pole is not only larger, but, theoretically, must also be more specialized in integrated logistics activities such as

preliminary processing, labeling, preliminary assembly, primary packaging etc.

The relations established between these two entities are also tied to a spatial placement in their relatively regional vicinity and a correlated institutional planning. The territorial linking is achieved through infrastructure. As such, spatially, the links are less visible, being mostly revealed through dedicated access routes and direct communication between transport terminals. The existence of areas serviced and assembled around systems composed from platforms and poles can suggest a local development potential.

The local development potential is revealed by the existence of sensible goods assimilation points in the territory (given that it is assumed that a pole and a platform can assimilate to a minimum level - for the local economy - a sizeable amount of products to establish a growth and subsequent clustering potential).

These entities must have a directing role, given that their existence in a regional system is a development carrier and practically furnishes the area with a positive character (regarding the potential). At the same time, the existence of areas whose development implies engaging economic mechanisms at a transnational level related to the national and regional ones is a major advantage for the local and regional economy.

In the end, any changes undertaken in the freight systems might influence the activity of the companies that take advantage of them. A highly efficient transport infrastructure with well dimensioned logistic centres (either logistic platforms or transfer poles) is

bound to increase the accessibility of goods and hence to reduce the time and costs of transport. Optimizing the process of merchandise transport allows further regional diffusion of products. Even though the markets have a weighty impact on how products are distributed, freight is little dependent on market scale. For that matter, we distinguish two likely scenarios:

- a. the logistic elements (poles or platforms) allows further diffusion of goods in the region, generating growth potential within that area.
- b. the logistic elements (poles or platforms) have no regional opening whatsoever and the merchandise is for external companies only.

Local growth is generated through sensitive diffusion of the maneuvered resources in the territory. However, this hypothesis is limited, because it is a hardly trackable process. Regional development usually implies economic, social and territorial factors. For that reason, it is hard to determine the overall influence of freight and merchandise diffusion in the adjacent territory.

### **5. Final conclusion, acknowledgements**

The territorial dimension of logistics and freight is marked by numerous shortcomings. The generic problem is the urban space limitation, from which many others derive. The poor management of time, the extended car fleet and the delivery mismatches are only a few of them. A way to address these issues is to implement new integrated distribution systems and a coherent network of logistic platforms or to properly dimension the existent one.

The platforms and the poles are intermediate elements in the transport system, both being essential economical assets.

The urban logistic perspective opens a new phase in product distribution, blending the economic activities within the transportation system. The main research question of this paper was: Are transport systems important for the economy? The rightful answer is yes, the economic development relies in various percentages on mobility of goods and of people.

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