

## Colloquium and Workshop

### "Logistics Cluster - realities, challenges and limits, a European perspective"

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#### Logistics clusters & economic performance

##### „Logistics Cluster - Aspects of economic Geography“

Gernot LIETDKE

The lecture „Logistics Cluster - aspects of Economic Geography“ analyses the contributions of traditional theories about the emergence of spatial clusters to the explanation of the emergence of logistics clusters.

The lecture understands logistics clusters as all kinds of locally limited concentrations of logistics firms. Quite a diversity of alternative designations exists, such as logistics villages, logistics platforms or logistics parks. Examples of such clusters are – among many others – Duisport, Güterverteilzentrum Großbeeren or the Intermodal Centres Elwood-Joliet.

In the literature, a lot of advantages of local agglomerations in logistics are listed. The presentation works out, that all positive effects could be subsumed as follows: a reduction of transport cost between facilities inside a cluster and of transport cost from the cluster to remote areas. In addition, inventory cost reductions are expected to occur. This includes the access to central services, too.

Central place theory explains the existence of a system of villages and towns in space and/or formulates requirements on an optimum spatial structure of such places. The system of central places is formed through the interplay of two forces: (1) High transport cost from and to the agricultural is a force towards small agglomerations. (2) Agglomeration benefits support the formation of large agglomerations. Looking in detail into agglomeration benefits, the access to central goods is predominant. Central goods, however, represent an outsourcing of activities within households to craftsmen and others. This means: A successful clusterisation goes hand in hand with a vertical division of labour.

Looking into the factors for and against clusterisation in freight transport, we can identify (1) transport cost of labour force from and to the cluster and of cargo from and to shippers and recipients in the surrounding area (in analogy to the same factors in the formation of central places). (2) one can also identify vertical collaboration (warehouse, forwarder, carrier, terminal) and fixed cost allocation of a terminal as well as positive network effects from intermodal connections to the rest of the world. However, horizontal collaboration (“sharing”) does not necessarily result from spatial proximity. Proximity is rather the result of complementary services, i.e. vertical collaboration.

Another theory dealing with spatial clusters is Porter’s Diamond model. It explains the existence of innovation clusters – such as Silicon Valley – by the interplay of following four phenomena: (1) Factor conditions: skilled labour, capital, infrastructure, (2) Demand conditions: home-marked demand of product and services, (3) Related and supporting industries: suppliers, other related industries and (4) Local rivalry: Firm’s strategy, organization, domestic competition.

Applying this Diamond model to logistics agglomerations, we can identify capital and infrastructure and relating and supporting industries. Skilled labour plays a minor role in logistics because innovations in logistics are driven by computer scientists today. The home market is located anyway in the region. Local rivalry, too, cannot be expected in mature logistics markets because there is a

trend to more and more homogeneous services. Summarizing, the same factors for and against clusterisation remain as important ones as compared to those that are predicted by central place theory.

Summarizing, it can be stated: There are huge expectations on the benefits of spatial agglomerations in logistics, but (1) Sharing, horizontal collaboration is a weak argument. (2) Transport savings within cluster are in opposition to transport cost from/to customers/commuter cost. (3) Innovation competition (Porter) will not happen in established markets (for instance, an established Güterverteilzentrum/freight village will not become the nucleus of a new type of intermodal services.

A successful logistics cluster needs to be well connected to its catchment area. This can be realized by localization nearby a motorway or by the generation of economically and ecologically viable connections to the last mile.

Finally, a successful logistics cluster needs to provide exclusive resource-efficient transport connections between differentiated facilities: This includes, for instance, an easy access from a warehouse to an intermodal terminal.

The latter requirement, however, is in contradiction to a non-discriminatory access to a publically funded combined transport infrastructure. In a future vision of a network of logistics clusters, elements of spatial competition and a revision of funding and regulation rules must be included.

*Keywords: logistics cluster; spatial agglomeration*

### **Les zones d'activité logistique : clusters logistiques ou co-localisation d'activités logistiques ?**

Nathan BOUNIE, Corinne BLANQUART, IFSTTAR

La communication questionne les effets de la concentration des activités logistiques sur des zones d'activité logistique, et ce faisant la pertinence de politiques publiques territorialisées visant à attirer des activités dédiées. C'est au regard des variations de productivité que l'influence des zones d'activités logistiques, misant sur les bénéfices supposés d'une proximité géographique des activités, est questionnée. Les résultats de l'analyse montrent que la concentration suscitée dans le cadre des ZAL contredit les effets positifs de l'agglomération mis en évidence par les travaux sur les clusters.

*Mots clés: productivité, concentration, clusters*

### **“Issue on spatial competition, governance on city logistics and pooling solutions in platform: a critical perspective of today development”**

Laurent GUIHÉRY, University of Cergy-Pontoise, Labo. MRTE

City logistics projects and research on pooling activities on logistics platform are nowadays on the agenda of land use planners and transport researchers. Local politicians and public policy designers have integrated these projects in new urban plans and future city modelling (Lyon for instance with a new urban consolidation centre around Cordeliers area). Do we face a “happy winner – winner organization” for all member of the urban club? How are the gains shared between all the members? Does this system keep a good level of innovation in transport and logistics companies? Is it sustainable in a long-term perspective, facing different modal alternatives, rail for instance? Do we have to take into account the long-term impact on innovation and possible distortion of competition and cartelization?

*Keywords: City logistics, pooling strategy, competition, cartelization*

## Logistics clusters: development and planning issues

### “Logistics sprawl, real estate dynamics and new urban warehouses”

Laetitia DABLANC

Many metropolitan areas around the world are also major logistics hubs, and a new logistics landscape has emerged characterized by a substantial increase in the number of warehouses around large cities. These logistics facilities serve local markets as well as the broader region. Together with this increase in warehousing, "logistics sprawl", the spatial deconcentration of logistics facilities and distribution centres, has been a dominant spatial pattern for the last decades in metropolitan areas. Logistics sprawl generates economies of scale for the logistics industry but it increases distances travelled by trucks and vans to deliver commodities to urban areas where jobs and businesses remain relatively more concentrated. A comparison of different case studies of logistics sprawl around the world will be presented, contrasting cities according to land costs, densities, as well as different types of land use regulation. A recent niche market for urban warehouses has emerged, responding to growing consumer demand for new logistics services (same day e-commerce deliveries). These new industrial buildings are commonly multi-story and multi-use. City authorities are increasingly inclined to favour, and even promote, this new type of urban land use in view of its benefits with regards truck-mile reduction and land footprint.

*Keywords: logistics sprawl; logistics hubs; case studies*

### “Deconcentration or concentration? Logistics locations in Berlin-Brandenburg”

Jens KLAUENBERG, Falko RICHTER, DLR

The presentation discusses the effect of deconcentration and concentration of logistics locations with Berlin-Brandenburg as use case. The research is connected to the analysis of the phenomenon of logistics sprawl. Changes in logistics location patterns are often described as logistics sprawl, whereas logistics sprawl is defined as „the historical trend towards spatial deconcentration of logistics terminals in metropolitan areas“[Dablanc and Rakotonarivo, 2010]. Implications of logistics sprawl are changes in transport patterns as well as effects on land use and emissions. Analysis on logistics sprawl was done in the US, in Europe and recently in Japan [e.g. Cidell 2010, 2011; Dablanc and Rakotonarivo 2010; Diziain et al., 2012; Sakai et al. 2015, 2017].

The objective of our contribution is to analyse the phenomenon of logistics sprawl and explaining its effects on local concentration. This will extend the understanding of logistics sprawl. Our research questions are: Can we observe distinguished concentrations of logistics facilities in different spatial areas, i.e. in urban, suburban, and rural areas? Which effects may explain concentrations of logistics facilities at certain locations? We conducted this analysis with a case study on warehouses in Berlin and Brandenburg.

Our area of analysis is the metropolitan area of Berlin and Brandenburg, which consists of the 12 districts of Berlin and 50 municipalities of Brandenburg close to Berlin. These municipalities in Brandenburg are defined as Suburban Brandenburg. The remaining 368 municipalities of Brandenburg are defined as rural Brandenburg, even knowing there are cities and small urban areas in this region as well.

The data used for this study are company locations from the German business register for Berlin-Brandenburg. The data are classified according to the NACE classification system. Data are available on the hierarchical level of groups (01.1 to 99.0). We analysed Warehouse locations, which belong to the NACE group 52.1: Warehousing and storage. This group is commonly used in the analysis of logistics sprawl. The data are spatially subdivided in 418 municipalities for Brandenburg and 12 districts for Berlin. Companies are classified in 4 economic size classes. Data are available for the period 2006 – 2015. We analysed data of the year 2013.

For the analysis we applied on the one hand classical concentration measures. The Gini coefficient was used as measurement of statistical dispersion. Theil index was used as measurement of economic inequality among population subsets. It can be understood as maximum possible entropy of the data minus observed entropy. Advantage of the Theil index is the additive decomposability characteristic. Limitations of classical concentration measures are among others, that the examination of spatial patterns is not possible and the Modifiable Areal Unit Problem (MAUP). Thus on the other hand Non-parametric Multivariate Kernel Density Estimation (MKDE) as distance-based method was applied. This allows a deduction of a density function by approximation of probability. Furthermore relative concentration can be analysed. Advantage of MKDE over standard mapping of data is the elimination of isolated points.

The application of classical concentration measures shows large differences in concentration between Berlin and suburban areas of Brandenburg. Indices of suburban Brandenburg are higher than Berlin. Differences to rural Brandenburg may appear due to different spatial setting in rural Brandenburg. But we can state the hypotheses of logistics concentration in suburban Brandenburg. Furthermore there are differences in concentration of logistics among municipalities compared to companies in general.

MKDE revealed spatial concentration hot-spots. Main hot-spot is the logistics belt with GVZ Großbeeren (Freight village) as centre. Secondary concentrations were identified along the motorway ring of Berlin. The comparison of industry and logistics concentration revealed different concentration patterns of logistics locations and companies in general.

Methodological we can conclude that classical concentration measures (indices) do not reveal patterns of concentration, whereas distance based methods (MKDE) convey further details which are not limited to political borders. Our main conclusions are: 1. Concentration of logistics facilities is not identical with concentrations of businesses. It follows own conditions. 2. Logistics clusters exhibit similar size and are evenly distributed around Berlin. 3. Logistics sprawl in the sense of deconcentration cannot be confirmed. There is deconcentration in the sense of movement from the centre to suburban areas, but logistics facilities concentration show also concentration patterns around the city of Berlin.

*Keywords: logistics sprawl; logistics hubs; case studies*

### **"The Marché d'intérêt national: contrasting choices and effects between urban integration and distant polarization"**

Danièle PATIER, Laboratoire d'Aménagement et d'Economie des transports de Lyon

A l'instar des Plates formes logistiques, les Marchés d'Intérêt Nationaux, véritables « poumons de la ville » ont entamé une migration des zones d'entrées de ville vers des zones de production agricoles plus lointaines. Cette tendance doit être analysée en termes d'efficacité de l'approvisionnement des villes, des modifications des déplacements des marchandises (et les conséquences économiques et environnementales) mais également à travers la capacité à maintenir l'agglomérat d'entreprises et d'institutions qui y fournissent des services annexes de proximité indispensables au bon fonctionnement des activités implantées en ville. Une recherche sur la pertinence des Espaces Logistiques urbains en termes économiques et environnementaux a pointé le rôle primordial des MIN. Dans ce contexte le MIN de Montpellier est apparu comme un modèle. Loin de l'évincer de la ville, la Métropole lui accorde un rôle majeur en l'intégrant dans le « Schéma Directeur de la logistique ». Nous analysons les effets de du maintien de la localisation du MIN en ville et du développement des services de proximité qui y sont développés sur la mobilité des marchandises pour approvisionner la ville et sur l'amélioration des conditions de vie des établissements économiques implantés en centre-ville.

*Mots clés: Marché d'intérêt; modifications des déplacements des marchandises ; logistiques urbains*

## Presentations of academic experts

### **“(De)constructing logistics clusters: a geographer’s perspective on agglomeration, proximity and scale”**

Markus Hesse

My presentation aims to confront the idea of logistics clusters – the agglomeration of firms and sites that serve the purpose of logistics and freight distribution – with a sympathetic critique from a geography and urban studies perspective. The normative ideal of clusters seems pretty clear and straightforward: bundling activities and facilities close to each other provides critical mass and competitiveness in economic terms, and it makes operations more efficient in terms of transport and land use. According to some observers, clusters are even good for the environment. However, this standard narrative needs to be balanced, by i) discussing the limits of agglomeration, where a certain level of concentration creates disadvantage and gets dysfunctional; ii) by contextualizing proximity, since being a neighbour does not necessarily mean to create associations in a world that is increasingly interrelated and connected; and iii) by introducing scale, i.e. the vertical dimension of decision making and power relations in supply chains. The standard cluster narrative is questioned by the ‘relational’ nature of contemporary economic space: If we assume regions to be necessarily ‘open’, policies to attain the desired impacts by co-locating activities close by are challenged. This raises the important question as to what informed cluster policies can achieve, other than providing a discursive frame for economic development policies.

*Keywords: Logistics clusters; freight distribution & supply chains; concepts of space; governance.*

### **Logistics clusters: a political economy approach**

Michel SAVY, distinguished professor, Paris East University

The issue of logistics clusters is, in the same time, a matter of industrial economy (including freight transport and logistics), spatial economy and public policies analysis.

### **Relationships between logistics and territory are intrinsic**

Freight transport is per se a spatial industry (to move goods from one place to another) and static logistics operations take place in specific premises (warehouses, etc.) frequently – but not always – located in specific sites. They are imbedded in a local surrounding and belong to multi-scale supply chain networks.

### **There exists a logistics geography**

The archipelago of logistics premises is neither evenly spread over the territory nor located at random. Two contradictory trends, at different scales, orient logistics spatial distribution: at large scale, polarisation around main metropolitan areas; at local scale, ex-urbanisation of logistics, expelled from city centres to ever more distant outskirts. The consequence of this implosion-explosion move is a constant search for new locations. These often take the form of logistics clusters, i.e. industrial parks likely to accommodate several logistics investments in the same site, organised or not as formal “freight villages”.

### **Logistics clustering as a process**

Clustering results from a multi-agent game, in which various public and private actors pursue their own objectives, different if not contradictory. Still, viewpoints and interests must converge, among State regulators, local governments, land owners, developers, real estate investors, logistics service

suppliers, shippers, etc., so as to decide about facilities requirements and about their locations in ad hoc sites.

For local authorities, developing a logistics zone aims at attracting activity, create jobs and collect taxes, support local manufacturing, trade, consumption through better logistics service, etc. It also helps organising freight traffic flows, reducing their environmental impact, and possibly supporting modal shift to rail or waterway.

For economic agents, building logistics facilities inside such a site can be quicker and easier than in a separate place: better social acceptance if local politicians explain and support the project (jobs vs. nuisances), faster building and operating permits obtaining, proper connection to heavy transport infrastructure, etc.

Experience shows that there are successes and errors in this field. Some logistics parks are fully occupied and are involved in constant renewal, others remain vacant: a good project must meet the needs of local economy, benefit from a proper location and a good link with transport networks. It also requires adequate public-private partnerships.

### **Are logistics clusters industrial districts?**

Do logistics clusters generate positive externalities? Indeed, they offer a favourable environment and provide a range of services and potential partners to firms located in them. But recent investigations show that synergies and actual cooperation between neighbour firms are rare and limited. Spatial proximity is less important than functional proximity with suppliers and customers outside the cluster.

Still, there are strong reasons for clustering! Logistics parks provide facilities and services that an isolated location could not afford (fire brigade 24 hours a day, access control, surveillance, signalling, management of common areas, waste treatment and energy supply, etc.).

Much more could and should be done, both for firms and for their employees, particularly to face manpower shortage managers frequently deplore: shops, canteen, professional training, employment agency, health centre, nursery, etc. and particularly adequate public transport as a substitute to private car. These matters are socioeconomic issues and would require innovative public and private management structures.

### **Logistics as a political issue (involving freight clusters)**

Politicians nowadays are aware of the importance of logistics in economic development. The World Bank publishes a Logistics Performance Index ranking, embracing some 160 countries. Several governments implement dedicated strategies, and Germany is frequently quoted as an example in Europe (see: Masterplan and Aktionsplan für Verkehr und Logistik). France launched a National Conference on Logistics in 2015 and prepares a new framework law likely to take these issues into account.

At local level – regional and metropolitan – public authorities include logistics in their economic development and land use planning. They aim at preserving logistics adequate locations, particularly if multimodal, and at inserting logistics clusters in proper outskirts surroundings. Those are linked with inner city “distribution centres”, according to a more coherent and sustainable design. Promoting logistics “clusterisation” helps solving these problems.

*Keywords: Logistics clusters; freight; governance*