Ifsttar Research Paper

More efficient siting of warehouse and distribution activity:

Logistics Spatial Patterns in Paris and the Paris Basin

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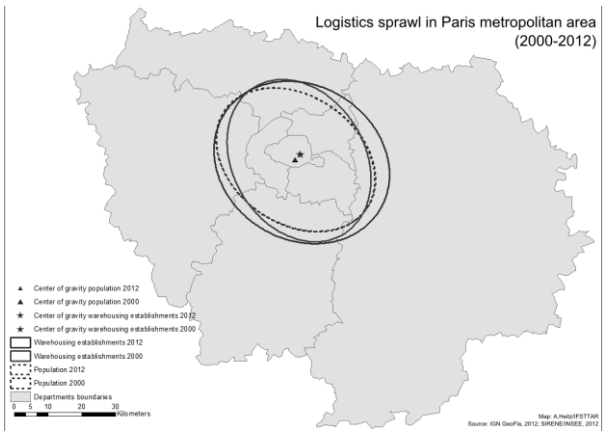
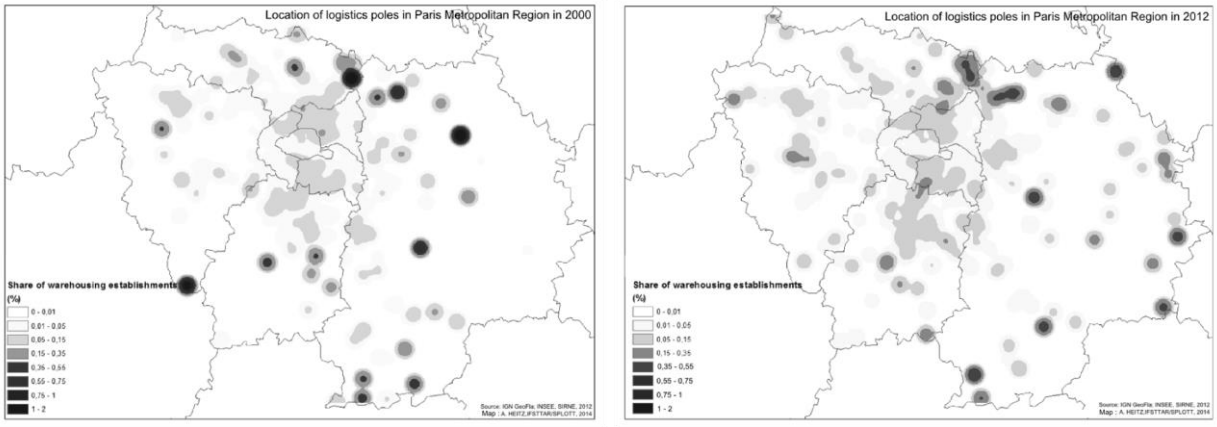
Research Objective: Urban sprawl is a matter of considerable concern to public authorities, based on the idea that the compactness of cities guarantees their sustainability. The term "Smart Growth" is also used to describe the improvement in the sustainability of cities, in particular by increasing the density of the urban space. Urban sprawl is a process which is not only due to sprawling of the population, but also of economic activities. These economic activities include logistical activities which, frequently unbeknownst to the public authorities, are also subject to processes of sprawl in metropolitan areas and contribute to their expansion, in some cases far beyond the area covered by residential expansion, pushing the boundaries of the metropolis further outwards.

Problem Statement: As it is difficult to identify the boundaries of a metropolis, we shall attempt to define the area it covers by means of a dynamic and functional approach. We examine the scale of logistics sprawl by analyzing changes in the location of logistics activities, in particular warehouses, in the Paris metro area. The goal of this study is to analyze the spatial footprint of the logistics system on the Parisian metropolitan space and how it may contribute to define a larger urban region, or megaregion. Both scales – metropolitan and megaregional – influence the spatial organization of the city.

Research Methodology: We analyze logistics sprawl in Ile-de-France between 2000 and 2012 using two complementary methods. Logistics sprawl takes the form of a disintegration of the concentrations of activities in the metropolitan area. The mean distance to the center of gravity has increased by 0.5 km. This spread is accompanied by the creation of new logistics clusters in the periphery. The technique of Kernel Density Estimation (KDE) allows us to identify "hot spots" and reveals both the process of sprawl and the development of clusters. The way the distribution of spaces that are specialized in logistics warehousing has changed allows us to glimpse a specific type of multi-cluster metropolis in the case of Paris. On the one hand



it is made up of low density clusters located in the inner suburban ring, and on the other hand it is spreading outwards by generating new suburban clusters which cause the conurbation to expand.



We put these findings into their context by considering the scale of the Paris basin. The number of warehousing facilities has increased by 30% in twelve years in the Paris basin. The logistics system, whose location depends to a large extent on the cost of the location of warehouses, will spread out around Ile-de-France in the Paris basin. Between 2000 and 2012, the mean distance from the center of gravity fell from 155 km to 110 km: there is clearly an inward movement around the Paris region. Thus, within the Paris basin the Paris metropolis can exert a force that both attracts and polarizes logistics activities.

Main Results: In this study we have documented a major rise in the number of warehousing and logistics facilities since the beginning of the 2000s in the Paris region and the larger Paris basin as well as some levels of logistics sprawl. The process is occurring at two different scales: on the one hand within the urban areas of the main conurbation, and on the other from the Paris region towards other regions. We identified two major dynamics which mark metropolitan areas. One is due to centripetal forces which are the outcome of the agglomeration processes which apply to cities in general. Metropolization accentuates this process, by increasing the proportion of functions which are located in the largest cities and increasing the concentration of the population in urban areas. Conversely, at the scale of the urban area, centrifugal forces push functions to the outskirts in order to keep high added value activities in the center. These two trends contribute to the dispersion and sprawling of activities into the suburbs, making the already unclear boundaries of the metropolis increasingly uncertain. The metropolitan system is therefore marked by an extension of its zone of influence as the result of an internal dynamic which tends to propel its population and activities outwards and which is heightened by the attraction of activities and population at the macroregional level. Our analysis emphasizes the existence of a spatial scale that is little recognized but is key to the understanding of the logistics system: the megaregional scale.