

Re-Mixing and Re-Using: the Urban Integration of the Specialized Filamentary Morphologies in Metropolitan Lisbon

Inês de Castro Luís Lopes Moreira

(MsC Inês Lopes Moreira, FAUTL and DUOT-ETSAB, Rua Sá Nogueira | Pólo Universitário | Alto da Ajuda | 1349-055 Lisboa-Portugal, ineslmoreira@gmail.com)

1 ABSTRACT

Twenty years after the consolidation of the administrative Lisbon's Metropolitan Area, its outcomes in terms of a trans-scalar approach to the region are still under development. In this sense, the planning of metropolitan Lisbon is confronted with a multitude of municipal, regional and national plans, acting at different scales, resulting in fractures and leftover spaces on its confrontation points, becoming potential interest areas for speculation and spontaneous urban developments. The consequences of this lack of territorial communication have an increasing presence in the landscape, resulting in the emergence of functionally specialized areas, in strategic points in terms of infrastructural connectivity but unrelated to the neighbor urban fabrics or city structure. At this redefining moment, the urban changes also take the form of obsolete urban areas and empty structures and in this sense, the re-colonization and the re-mixing of uses and urban elements is a key-element in the discussion of the metropolitan areas.

The increasing mobility, the consolidation of the infrastructural network and the resulting changes in the way of inhabiting the city have contributed to a growing urban polarization in metropolitan Lisbon. This network, consisting initially of a combination of harbor, railway and national roads has gradually been replaced by an articulated system of highways, that connect and structure the territory local and nationally. This change has created conditions for the emergence of functionally specialized urban formations, supported by the blurring of traveling distances and the high degree of connectivity. Hence, the network acts as catalyst for the polarization, characterized by the occupation of peripheral areas in strategic locations, creating filamentary morphologies along the highways – metropolitan filaments – with functions mostly related to the tertiary and quaternary sectors (logistics, retail, offices or R&D).

These changes reveal the diverse nature of the new specialized morphologies, spontaneously generated and unrelated to the formally recognized designs, through self-organizing processes invariably developed in parallel to the existing planning tools. Distant from the usual functional and formal logics present in the planning activity, it results of the interaction between the market laws and the layout of the mobility infrastructure (designed independently of the surroundings, aiming to establish the most efficient connection between its points). As the backbone for the new urban formations, the design of this mobility network, its access and connections influence the process of urban development, different from the traditional juxtaposition growth, with morphologies directly related to the infrastructure. According to their nature and location, these urban formations have its genesis related to production and distribution activities, in association with the railway and harbor development. Later, as a reply to new economic and social demands, some of these areas have become obsolete, as others have showed resilience in adapting and incorporating new activities in relation to the highway network. Nowadays, with a fast changing society and the different ways of living in the city, how can the metropolitan filaments re-adapt and re-mix the urban functions?

The morphological changes in Lisbon's territory reveal local features associated with specific geographic, historic, social and economic conditions, which require a multi-layer analysis to the recent urban formations and to their relationship with the supporting infrastructure. The research methodology is based on the identification and classification of specialized urban formations, based on field work analysis of metropolitan Lisbon; and morphogenetic analysis of the metropolitan filaments and their correlation with the overall metropolitan shape and the infrastructural network, based on the layering of cartography of different time periods: a) Until 1970: the harbor and the railway as the support of the industrialization and formation of the metropolis; b) From 1970 to 1990: the setting up of a high-speed road network and the terciarization of the territory; c) From 1990 to 2010: the consolidation of the highway network, the raise of the quaternary sector and the functional specialization of the metropolitan filaments.

2 METROPOLITAN FILAMENTS

The contemporary world is a set of constant and immediate changes that take place at a speed that makes its analysis and conceptualization difficult. These transformations are driven by aspects related to demographics, economics, mobility and connectivity¹, challenging the urban life and its classical paradigms by placing new questions to the cities. Lisbon is not oblivious to this international phenomenon that leads to interpretations of the current structure of the metropolitan territory as an expression of the contemporary culture. The modifications in the way of living and inhabiting the city have caused a fragmentation and a growing urban polarization², in which mobility shaped the morphology, with special importance since the introduction of car use in urban daily life, coupled with the increasing number of inhabitants and the need to respond to rapid changes of scale and uses. As result, have emerged new ways of living and socializing, new market logics and new urbanization, driven by the increasing movements in an urban extension that already does not follow the logics of continuity but of the connectivity promoted by the infrastructure network and the availability of building areas, new processes for distribution of goods and information, new forms of work and the changes of social structures (Portas, et al., 2011).

The mobility network of metropolitan Lisbon consisted initially on a combination of railroad, harbor and national roads and was gradually complemented by an articulated system of highways and freeways. This situation has created the conditions for the emergence of functionally specialized urban morphologies, supported by the blurring of traveling distances and the high degree of connectivity. Hence, the network acts as the main catalyst for the emergence of these urban formations characterized by the occupation of peripheral areas in strategic locations in relation to the network, creating filamentary morphologies along the highways, with a high degree of functional specialization³ (metropolitan filaments). This increase of mobility within the metropolitan region has allowed for the displacement of programs that require large building areas to the outskirts, creating new monoprogrammatic poles (Ascher, 2008), dependent on the center for population, supplies and equipment. These specialized areas are defined at the administrative level as clusters (business Area, Science Park, Business Park, etc.) and are deployed in still unoccupied spaces, whether rural or obsolete industrial areas, operating transformations supported by an urban marketing which promotes the proximity and access to the center, or the effective capacity of connection to national/transnational roads and railways or to the airport. With different origins, these urban morphologies tend to be subsidiary of the center, contributing to a growing spatial and social segregation.

The metropolitan filaments formalize a private response to market demands and are usually spontaneously generated and unrelated to the formally recognized designs, through self-organizing processes developed in parallel to the existing planning tools. Distant from the usual functional and formal logics which are present in the planning activity, they result of the interaction between the market laws and the layout of the infrastructure elements, leading to their disorganized image, revealing a lack of integration between its parts – the roads, the new built elements and the physical environment (natural and built). The thickness of the road⁴ is, then, dependent on the willingness of the market, distanced from the urban planning and not resulting as an integrated project of these three elements, but as a lack of the understanding of the implantation logics of the recent urbanization and an inability to recognize the spatial structure that supports the landscape.

The territorial changes in metropolitan Lisbon over the past decades allow for an identification of the areas that showed the capacity for regeneration and adaptation, as well as others that have been abandoned

¹ The ability that a point has to be integrated into a network of roads and canals, using multimodality situations that allow mobility, both in terms of transport, telecommunications, water supply, gas or electricity. On the one hand it brings individuals and spaces together, but at the same time allows for the dispersal of urban occupation. In GRAHAM, S.; MARVIN, S. *Splintering urbanism: networked infrastructures, technological mobilities and the urban condition*. London, 2001.

² Set of urban formations that appear impelled by the metropolitan mobility infrastructures, supported by the accessibility or visual display and by activity enclaves based on synergies and location economies. In FONT, A.; LLOP, C.; VILANOVA, J. *La Construcció del Territori Metropolità. Morfogènesi de la regió urbana de Barcelona*. Barcelona, 1999.

³ With programs related to secondary and tertiary sectors (manufacturing and distribution) and the tertiary and quaternary sectors (trade, services and research & development).

⁴ Formed by the relationship between the road, the growth and physical context. In SECCHI, B. *Lo spessore della strada*. Casabella, 553/554, pp. 38-41. Milan, 1989.

revealing an inability of reply to different demands. The metropolitan filaments were defined over time in order to meet the needs of the urban structure, taking advantage of the physical and infrastructural conditions without an overall vision. The result is present in metropolitan Lisbon where the segregation of functionally specialized areas led to isolated and abandoned areas where their main industrial function ceased. There is a great range of causes that have driven to this phenomenon in the Lisbon's metropolitan territory, but the paper focuses on three main axes related to the analysis of the undertaken changes at the level of the urban systems, economic activity and urban life.

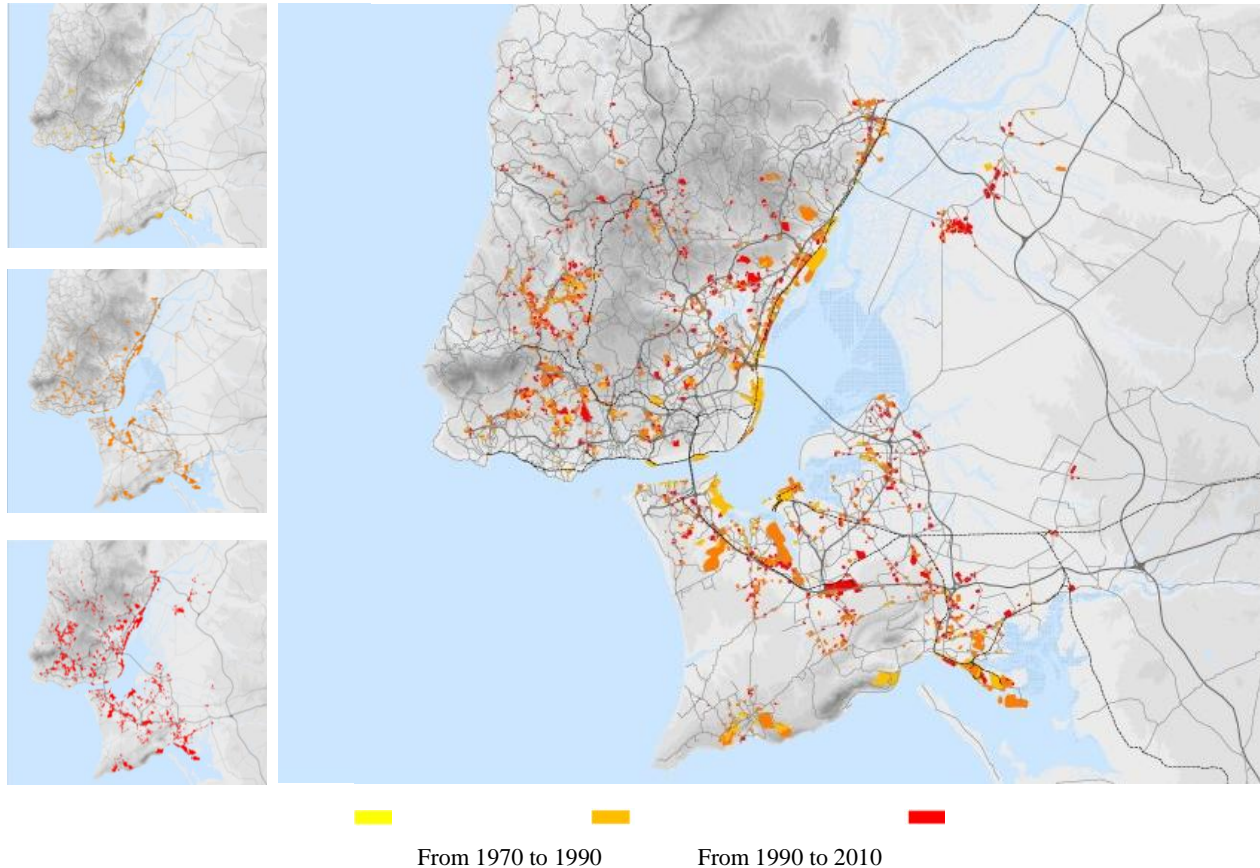


Fig. 1: Space occupied by economic activities connected to the secondary, tertiary and quaternary sector) in Lisbon's metropolitan territory, until 2010. Own elaboration, 2012.

In a fast-changing world, when vast industrial areas are being abandoned and high technological clusters are emerging, the main question driving this analysis lays on how the metropolitan territory can regenerate, adapting and replacing its obsolete areas and creating a different layer of occupation and use. In order to understand the process that led to the contemporary specialization of metropolitan Lisbon, its recent changes and their territorial impact regarding the formation and consolidation of the metropolitan filaments, is presented divided into three time periods: until 1970, from 1970 to 1990 and from 1990 to 2010.

3 THE TRANSFORMATIONS IN LISBON'S METROPOLITAN TERRITORY

3.1 Until 1970: the harbor and the railway as the support for the industrialization and the formation of the metropolis

The configuration of Lisbon as a metropolis was formalized from the 60's onwards, vertebrated by the mobility infrastructure, which contributed to a distended occupation of the territory that extended its physical limits and contributed to a suburban growth concentrated in industrial and residential areas, related to the railways, existing since the nineteenth century and the new highways⁵.

⁵ In 1944 was opened the section of A5 between Lisbon and the National Stadium, in 1961 was opened the section A1 between Lisbon and Vila Franca de Xira, and in 1966 was inaugurated the 25 de Abril bridge and the section of A2 between Pragal and Fogueteiro.

Despite its neutral position in the World War II, Portugal had an active role in the supply of goods to the involved parties. During this period, the growing importance of the industry was formalized in the implantation of various factories in the region of Lisbon, driven by the increase of exportations and the investment in the production for domestic consumption. Although Portugal was fighting the colonial war, during the 60's there was a growth supported by the expansion of the secondary sector associated with the transformation of raw materials from the colonies, as well as the war industry (Conceição ; Heitor, 2002). Thus, in a region with an incipient presence of the tertiary sector, the industry was the main economic engine, establishing itself as a set of urban development centers, creating jobs, attracting people, other industries and associated services, with a logic of dynamic urban growth.

One of the main characteristics in the genesis of today's identifiable metropolitan filaments is the presence of this industrial structure as the engine for the location of urban settlements, which allowed for the establishment of subsequent activities. Although many of these factories are currently inactive, abandoned or converted, their location logics are present in the territory, in the dialogue with the urban fabrics and with the surrounding infrastructure. Their strategic location with regard to the physical support (topography, water courses, solar orientation, wind, etc.) and the availability of land for construction and connection to the infrastructure (in order to transport raw materials and goods) laid the foundations for the creation of industrial axes. This close relationship between harbor, railroad and the industrial location is present in metropolitan Lisbon: until the consolidation of the high-speed road network, the industrial freight was materialized by the rail and harbor infrastructure, which articulation is evident in the strategic location for a regional and international distribution of goods, by land or sea/river. The Tagus estuary offered exceptional conditions in physical terms as in relation to Lisbon, which catalyzed a development and investment in harbor infrastructure, both in general cargo – as in Alcântara or Xabregas – or as private terminals connected to large industrial units – as is the case of the Sacor refinery in Cabo Ruivo, Lisnave in Margueira, arsenal in Alfeite, Siderurgia Nacional in Seixal or CUF in Lavradio. On the other hand, the Sado estuary was the other main offloading point for the goods produced in the factories of the Setubal peninsula. The development of the harbor had a similar organization to Lisbon, with the transport of general cargo through the terminal of Fontainhas, or via private terminals associated to industries such as Movauto (automobile) or Inapa (cellulose). The metropolitan rail network consisted of five lines, with three serving directly the city of Lisbon, in use since the late nineteenth century – the Cascais line, the Sintra line and the North Line – which allowed for commuting and the expansion of the residential area of Lisbon. The lines of the North, West and South were part of the national mobility network for the transport of passengers and goods, and played an important role in the location and development of activities that would formalize the metropolitan filaments.

These industrial sites had a strong territorial impact as they occupied vast areas, generally located outside the city limits, in a close dialogue with the infrastructure. These industrial areas generated a great attraction of inhabitants and urban growth induced by the job opportunity, as well as the facilities created by the factories for their employees (housing, schools and recreation areas). Later, when these industries became inactive, they were already integrated in dense urban fabrics that developed in their surroundings and present an interesting opportunity for re-mixing the programs and re-using their obsolete space.

3.2 1970-1990: the establishment of a high-speed road network and the tertiarization of the territory

During the 70's, Portugal has undergone profound changes, with particular emphasis in Lisbon, as the capital of the country and stage of various population migrations. The end of the regime and the establishment of democracy in 1975 were surrounded by a climate of growing political, social and economic instability, associated with fast population growth, the global oil crisis and a raising inflation that led to various social upheavals and strikes (George ; Morgado, 2007). The industrial sector suffered with these changes, as well as with the loss of raw materials from Africa with the end of the colonial war in 1974, resulting in a fall of manufacturing employment. On the other hand, a flow of more than half a million Portuguese rushed to Lisbon escaping the war in the former colonies (Salgueiro, 2001). This set of conditions shaped the phenomenon of the explosion of Lisbon's outskirts, explained by the need for housing a large number of families, stressing the territorial dispersion along the axes defined by the railways and highways, resulting in a high-density urbanization and rapid urban growth. Joining the European Economic Community in 1986 was the turning point for the process of stabilization and democratic consolidation of the country. The opening to the international market and the access to the European funds helped to bridge the structural

delays and boost the economy. This was the moment of transition to the following urban cycle, through the construction of the road infrastructure planned in the Master plan of the region in 1964, sanitation, equipment and the regeneration of degraded neighborhoods.

The metropolitan growth up to 1990 witnessed an expansion of the metropolis on the north bank and the industrial conquest of the south bank of the Tagus, through the establishment of industrial units with high technological component requiring large areas of deployment, accompanied by an accelerated residential development. During the 70's and 80's significant territorial transformations occurred, in which the functionally specialized occupation of strategic areas, allowing for the definition of axes which began the formalization of today's metropolitan filaments. The importance of the harbor and railway in the transport of goods and its consequences in the territorial hierarchy were gradually replaced by the high-speed road network. From the 80's on the territory was structured by a metropolitan system of highways which overlapped and absorbed the prior national road system, consigned to the accessibility at local level – the existing national roads became second-degree distribution elements, that vertebrated an urban growth induced by the higher-order network, with a growing importance in the articulation with the exits of the highways, railway stations and harbors. The process of expansion of the network was based on three main existing axes that have undergone extensions and enlargements. This restructuration, coupled with a growing motorization, introduced different urban experiences that diluted the limits and the central importance of Lisbon. The result was a distended occupation of the territory, as the metropolitan structure was transformed from an organization based on the accessibility to a single center, to an infrastructure network that promotes mobility between various points of great connectivity, creating the foundation for a polynuclear structure.

The pace of the industrial growth had slowed down after 1973, with increased expression in the 80's. This situation is explained by the international economic downturn in the demand for the exportation products, along with the economic restructuring connected to the introduction of new technologies in the 60's leading industries (siderurgy, heavy metalworking, shipbuilding and ship repair). Along with political changes and following the international trends driven by the market opening, the region suffered profound economic changes related to technological and transport improvements. The main result is present in the shift from an economy centered on the manufacturing sector to a service economy. The industrial production model of concentration in large areas with high territorial presence was gradually altered to a post-Fordist model, characterized by the segmentation of the production cycle and its consequent relocation to distant places, inducing the growth of processing and distribution activities. On the other hand, while the industrial activity slowed down, the service sector showed an increasing dynamism, associated with support services to economic activities, storage, distribution and retail. There was, then, a relocation and distribution of services that underscored a trend towards the functional grouping of activities, with the development of industrial and storage areas outside the city in connection with the main roads, in a centrifugal movement away from the harbor (Salgueiro, 2001). Therefore, it had been initiated a new process of hierarchy of the territory – a topological organization of the metropolis – defined by the degree of connectivity of each location in relation to the mobility network. This resulted in a set of opportunity spaces based on the ability and the speed of connection between the points of the network, at a metropolitan and national level, in which the urban growth was connected almost exclusively to the impact of the infrastructure (Morgado, 2005).

The main territorial consequences of these changes are present in the abandonment and gradual reconversion of large industrial areas and the shift to concentrated areas of small and medium-sized logistic units (assembly, processing and distribution of products). In contrast to the previous period characterized by high impact territorial interventions, these decades were marked by the atomization of smaller scale activities through spontaneous processes guided by location logics related to the ability of movement within the region/country. The agglomeration of these activities and its resulting urban morphologies led to the definition of functionally specialized axes in the territory that would be consolidated during the next period. The analysis of these morphologies allows for the identification of two types of relationship with the former industrial layer formed up to 70's: on the one hand, the emergence of urban clusters in previously unoccupied locations, taking advantage of its newly created connections to the infrastructure network and, on the other hand, the intensification and consolidation of the urban morphology from the existing industrial structure.

3.3 1990-2010: the consolidation of the highway network and the functional specialization of the metropolitan filaments

This last period has its origins with the accession of Portugal to the EU, in 1986, which consequences are felt during the 90's with the solidification of democracy and political normalization, allowing for the consolidation of the metropolis and its consequent modifications. The most visible territorial impact occurred in the boost of infrastructure combined with a functional complexity, which allowed for alternative centers to Lisbon. The occupation process that had started in the 80's continued, with urban morphologies directly related to the metropolitan mobility network, creating a topology that has steadily grown in importance in the structuring of the territory. The capital injection combined with the modifications in international relations and the globalization, has originated the changes that have occurred in the industrial and distribution sector. The tertiary and quaternary ⁶ sectors grew, gradually replacing the secondary sector, determining the obsolescence of the industrial and harbor areas and originating new opportunity areas integrated in the metropolitan system.

During the 90's, by imposition of the European Community were defined the legal conditions for the realization of land management plans, such as the municipal master plans, urbanization plans and detailed plans, which corresponded to a decisive stage for the understanding of the region as a whole, formalized with the establishment of the Lisbon Metropolitan Area in 1991. However, the planning activity couldn't always keep pace with the speed of the social, economic and territorial transformations that took place during this period. The carrying out of these municipal plans to the fullest extent of the metropolitan area showed a great political, technical and financial effort, but has seen its effectiveness compromised by the lack of coordination between the municipal and regional level, giving rise to a set of fragmented views of the region with territorial fractures that reveal a lack of integrative policies and of spatial planning strategies (Bruno Soares, 2003). Taking advantage of this lack of dialogue between the plans, arose the spontaneous urban developments, of private initiative and driven by the market laws, which seek peripheral locations with efficient road connections, forming anonymous agglomerations that can be found spread throughout Lisbon's metropolitan territory.

Great advances were achieved at the infrastructure level, at the mobility network, with the set up of a system of highways along with improvements in existing railway lines, which created a more homogeneous distribution of accessibility and enhanced the emergence of new polarizations. The impact of this metropolitan network, with national and international connections – through the construction of road and rail connections with Spain, harbor and airport improvements – was felt in the definition of various forms of centrality in the territory, which originated a change of location logics, with a more comprehensive mapping process, overcoming the administrative boundaries and establishing international connections for the distribution and commercial purposes. On the other hand, the technological developments, the access and the widespread use of new telecommunication technologies have reduced the importance of the physical presence in activities related to intellectual services. This situation enabled a freedom that was formalized in the relocation of corporate headquarters and high technological industries to business and technology clusters, physically distant from the center where they were traditionally located. Many alternatives to the congested center of Lisbon arose, in locations that offered a set of buildings designed for the specific use associated with the quaternary sector.

The development of functionally specialized urban morphologies created spaces targeted for efficiency, leading to the abandonment of the programmatic and scale mixture that is characteristic of the canonical in the city. Hence, the territorial hierarchy originated by the connectivity boosted the growth and specialization of the metropolitan filaments. This is transversal phenomenon to various metropolises, based on the synergies created between the constituent parts through functional complementarity between research, development and production as well as production, distribution and trade (Vecslir, 2007). It is possible to group them in programmatic typologies: the technological and production specialization, leisure, retail and distribution specialization and the specialization associated with the production, processing and distribution.

⁶ The quaternary sector (or superior tertiary sector) of the economy is an expansion of the three traditional sectors, which classifies the activities related to intellectual services, specifically, with the generation and diffusion of knowledge: culture, education, information technology, research and development.



Fig. 2-4: Programmatic specialization areas: Porto Salvo (technological and production); Alfragide (leisure, retail and distribution) and Feijó (production, processing and distribution). Own elaboration, 2012.

The technological and production specialization consists in a set of business incubators, technology parks, business centers and logistics centers that associate corporate headquarters, financial activities, research and development and technology-based industries. The most paradigmatic example of this specialization is in the area between Lisbon, Cascais and Sintra (conditioned by the highways A5 and IC19), which concentrates a large number of business parks induced by the success of Tagus Park – an urbanization plan with an area of 360 hectares, from 1995, resulting of a public investment that combines a municipal and national strategy in to order to invest in the modernization and technological innovation as a means of increasing the international competitiveness of the economy, linking teaching to research. These clusters are supported by the connectivity of the road and rail network for the transport of their co-workers and clients, as well as the consolidated urban settlements and proximity to Lisbon.

The concentration of leisure, retail and distribution spaces consists in an agglomeration of retail, shopping centers, supermarkets and leisure, sports and hotel activities that arises in peripheral locations close to the center. Often these areas are associated with service activities, and use the same logics that reveal a dialogue between the degree of coverage of a specific location in terms of population (the radius of influence in terms of distance) and site conditions (availability and price of land, municipal plans, customers, etc). In this sense, the areas of Alfragide, or the shopping areas of Alcochete and Almada are examples of commercial areas combined with logistic units and services. Their strategy reveals a metropolitan approach by taking advantage of still unoccupied areas that were formerly rural or located in industrial parks, but recently integrated into the mobility network, which allows for the attraction of clients at large distances.

The concentration of production, processing and distribution, through a combination of industrial buildings with commercial, exhibition, storage and logistics activities, is the result of the adaptation to the industrial progress and modernization of the productive sector. The consequences of this change have been felt after the 80's with vast abandoned and obsolete industrial areas, and the shift towards a concentration of small and medium enterprises in industrial parks or logistics centers, also supported by the network connectivity, with special focus on the transport of goods. Based on its favorable conditions, the axis between Xabregas and Vila Franca de Xira, has suffered a gradual replacement of the industrial concentration for a combination with storage, display and trade. A similar process led to the intensification of areas that have emerged in the previous period, associated with industrial activities and storage along the A2 highway between Almada and Palmela, combining exhibition, storage, trade and distribution (mainly automobile or building materials).

4 RE-MIXING AND RE-USING: FROM AN INDUSTRIAL SITE TO PARQUE DAS NAÇÕES

As a result of the technological changes and keeping pace with the general process of obsolescence of heavy manufactory, several examples of abandon of former industrial sites may be found in metropolitan Lisbon. These spaces became of great interest in terms of centrality and touristic potential along the river front and become impulsionators of urban regeneration – the former industrial sites of Lisnave (Margueira), Siderurgia Nacional (Seixal) or CUF (Lavrado). Although several of these sites have been object of studies and proposals, the processes are dependent on the administrative approvals as well on the funding and investment priorities. The most paradigmatic contemporary process of re-mixing and re-using the territory is the process that originated the Parque das Nações, a major urban regeneration scheme developed for the site that hosted the international exhibition Expo '98.

Previously an industrial area with great dynamism, the site was part of the axis that extended along the river from Xabregas to Vila Franca de Xira. This axis aggregated the first industries of Lisbon in articulation with the estuary, the railway and the highway. The urban plan was based on the deactivation of the industrial area

of Cabo Ruivo, formed by the Sacor oil refinery operating since 1947, the city slaughterhouse, the general war material deposit and the major waste and water treatment of the city. The site at the east end of the city, located between the municipalities of Lisbon and Loures, was chosen as it offered the opportunity to regenerate a part of the city giving shape to urban policies which reflected a more critical and interventive approach to the urban structure.

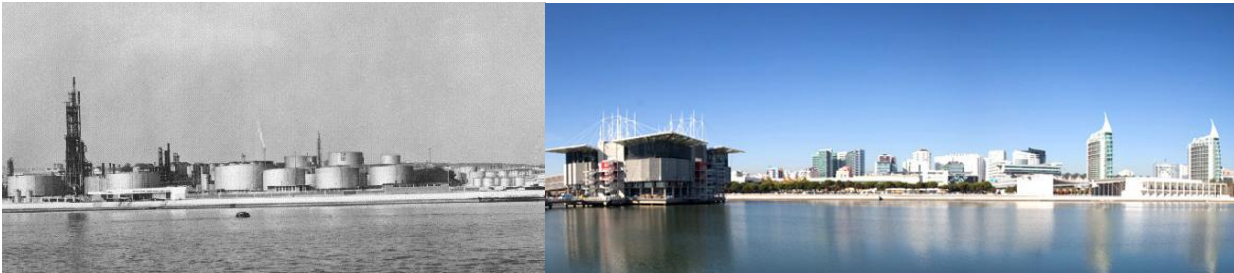


Fig. 5-6: Sacor refinery in Cabo Ruivo (1961) and Parque das Nações (2011). Sources: Serôdio, A. in arquivomunicipal.cm-lisboa.pt (consulted 23.01.2012) and portaldasnacoes.pt (consulted 20.03.2012).

The process started in 1993 with the creation of a private company with public funding (Parque Expo) that would be responsible for all the development and implementation of the plan, and in 1994 a master plan was approved, establishing the master plan of the area as well as six detailed urban plans. The urban design presented as goals the creation of a metropolitan centrality and of an area with environmental quality, revealing the strategy to reinforce the image and competitiveness of the city. The requalification brought improvements in the infrastructures (the construction of the bridge Vasco da Gama, the extension of the metro line, etc.) that allowed for the creation of a new centrality in the metropolitan area, with 340 hectares (from which the exhibition occupied 60 hectares). After the exhibition some of the key buildings remained, creating the multifunctional centrality aimed by the plan, as well as hotels, offices, housing and public spaces in the form of urban park, squares and a river promenade. The program of the operation proposed 638.000 m² of housing, 240.000 m² of multi-uses (offices, shopping and others), 85.000 m² of industry and 467.000 m² of equipments. Housing and multi-uses/equipments are the dominant urban uses, corresponding to 45% and to 50% (respectively 17% + 33%) of the total 1.430.000 m² of construction. The urban design technique for functional organization defined areas for equipments (corresponding to the area of the exhibition, including small restaurants and bars); the mixed area (corresponding to the interior zone between the equipments area and the railway including offices, hotels, shopping and residential buildings) and the housing areas in the north and in the south (Costa, 2006). Divided in two phases, the master plan is nowadays fully implemented and the area presents 20.000 inhabitants and 20 million visitors/year, as it constitutes one of the touristic spots for foreigners but also Lisbon's inhabitants (mostly at the weekend).



Fig. 7: Urbanization Plan of Parque das Nações, 1991. Source: GEORGE, P.; MORGADO, S. "Área Metropolitana de Lisboa 1975-2001. De la monopolaridad a la matricialidad emergente = Metropolitan Area of Lisbon 1970-2001. From monopolarity to an emerging matrix pattern" In FONT, A. (ed.) *L'explosió de la ciutat : morfologies, mirades i mocions sobre les transformacions territorials recents en les regions urbanes de l'Europa Meridional*, pp. 62-85. Madrid, 2007 (reviewed edition).

As part of one of the oldest metropolitan filaments of Lisbon, located in an area in close articulation between the river and the railway and highway, the area of Parque das Nações presents a radical intervention in a segment of an area with great potential for urban regeneration (the axis Xabregas- Vila Franca de Xira). The importance of this urban project doesn't rest only on the created spaces, but also on the opportunity to regenerate obsolete sites of the city by proposing new infrastructure, programmatic mixture and allowing for the integration and dialogue with the surroundings and with the river. Catalyzed by the international event of Expo '98, that acted as the engine for the requalification of the oriental part of Lisbon, the adopted strategy was based on re-mixing programs and creating an articulation between the city and the former industrial

harbor area, by the use of planning instruments (master and detail plans). The example of Parque das Nações allowed for opening the debate about urban regeneration of brown fields in Lisbon and the metropolitan integration of former industrial peripheral areas.

5 CONCLUSION

The current organization of Lisbon's metropolitan territory is the result of a widening and intensification of the structure outlined in the 60's, followed by an urban explosion in the following decades that has led to the present redefining moment, when the future of the metropolis should be questioned and discussed.

The establishment and consolidation of the metropolitan filaments consists in a dynamic process of layering of the territory that has been pointing towards an increasing functional specialization by the concentration of complementary programs, without a programmatic mixing. The mobility network played a decisive role in the establishment of the activities and the occupation of the territory, along with the natural conditions of support, the urbanization and, later, the planning activity. Thus, urban morphologies emerged, related to activities logically located in a close relationship to the degree of connectivity offered by the mobility network. In this way, the territorial hierarchy is defined by its connectivity where the airport, harbors, railways and the highway system form the high-speed mobility structure (at regional, national and international level), and the national roads systems ensure the local level of distribution and accessibility. It is the dialogue between these two systems that allows for the development of the metropolitan filaments along the transversal axes (national roads), that communicate with the high-speed network.

The origins of the metropolitan filaments reveal a response to the metropolitan demands, structured prior to the planning, related to the settlement of the industrial fabric until the 70's. Since the mid-twentieth century, the close relationship between the railroad and industry was present as an urbanization and economic engine for metropolitan Lisbon. After the 70's, this reality was replaced by the territorial relationship established between the high-speed road network and logistics, exploring different locations that coexisted and complemented the previous industrial layer. The 90's transformations, the deindustrialization process, the current functional specialization and the growth of the quaternary sector originated new (physical and virtual) spaces and created territorial scars related to the abandon of industrial areas, encouraging the discourse of urban regeneration and occupation by new uses.

At a metropolitan scale, the intensification of the specialization of the territory has created axes where the absence of planning originated the segregation and the lack of communication with the surrounding urban fabrics. The recent metropolitan changes have created vast unoccupied areas as the result of the abandon of industries, creating empty spaces and that can be seen as an opportunity to regenerate and adapt to the contemporary demands. The presented example of the regeneration of the area of Parque das Nações was an exceptional process that drew the guidelines for preceding urban regeneration processes. Although there have been punctual actions of re-mixing and re-using obsolete industrial areas, there is still a great challenge in creating overall strategies for integration and re-use of the metropolitan filaments in the urban structure of Lisbon's metropolitan territory. This is one of the biggest urban challenges for metropolitan Lisbon in the near future.

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