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THE TRANSFIGURATION OF FABRICS AND THE DEVELOPMENT OF ARTIFICIAL LAND IN LISBON

Abstract: Like other harbour cities in Europe, Lisbon has an axial development anchored in pre-existing configurations which dot from east, more industrial areas, to the west, a more monumental and urban type. The diversity of fabrics and the overlapping of various time layers become decoded through a functional specialization infrastructural line, which, from rural, becomes increasingly infrastructured as part of the on-going reinvention of the city of Lisbon.

Keywords: Harbour city, housing, urban design.

1. An infrastructural line of functional specialization

The Tagus estuary has always been the great engine behind the urban development of metropolitan Lisbon, both with regard to the location of urban settlements along its banks, and in relation to the urban formation that originated the current configuration of the city.

The economic importance of one of the most important harbours in international routes, as most until the brink of the post-industrial period, boosted the expansion of the city's specialized water front. This would occur, as in most European harbour cities, with the introduction of railway infrastructures, creating artificial embankments by means of infill lands and specific docks and quays. These areas of artificial land have become crucial, especially since the nineteenth century. Today, they are privileged areas in terms of urban intervention, qualification of public spaces and urban regeneration.

Similar to other European cities, the Tagus estuary, once a major Port of the Capital of an overseas empire, has undergone several changes in order to suit its vocation of acquiring a more urban character with greater functional diversity, which, according to public opinion, means that the *River has been returned to the City*. As widely recognized, Lisbon owes much of its development to its Port [Gaspar 1993].

Already in the 1980s, the introduction of new economic and production models considered to be just-in-time or post-Fordist, exposed the obsolescence of large industrial areas and highlighted the need for their necessary release. Due to their central location, new land uses were devised for them, bringing about the opportunity for qualified interventions which, during the 1990s, characterized a period of city development, clearly in a metropolitan context [George *et al.* 2007].

These changes have favoured not only Lisbon and other urban structures of the metropolitan area, which today get pleasure from their riverside with higher urban and environmental quality. It must be stressed that in earlier centuries when difficulties in terms of mobility were higher, coastal settlements linked up using river barges along the banks, especially the south bank, in an attempt to strengthen the economic opportunities, the Tagus River had to offer (Fig. 1).

Until mid-twentieth century, there was a significant urban transformation, which, on the one hand, resulted from interventions made prior to the implementation of the Republic (1910) and which were conducted by Ressano Garcia in Avenidas Novas, Campo de Ourique and the Port of Lisbon (França 2009; Henriques da Silva 1989) and, on the other, announced the changes that were to be carried out in the Duarte Pacheco period by national and foreign urban planners (Alvalade, for example) during the Estado Novo.

This clearly contributed to the existence of urban growth forms associated with the industrial model that was marked by axial developments along waterfronts or axes of the city's expansion towards the north (Morgado 2010). In terms of morphogenesis and functional development, two distinct processes have been identified in Lisbon's riverside axis:

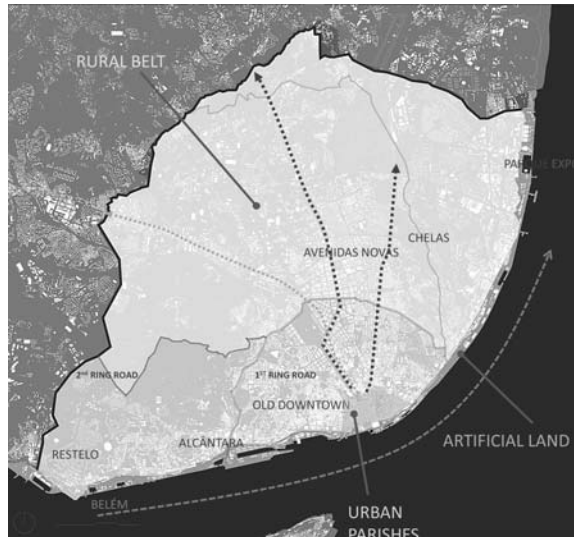


Figure 1. The city of Lisbon and its borders

Source: [Morgado 2010].

- The basis of the transfiguration of fabrics, as a result of the integration of old Estates, gardens, some of them historical, and other private spaces into the new urban fabrics which thus adapt to new land uses and circumstances in the context of the expansion of the city;
- The development of artificial land, with the modelling and specialization of banks and estuary canals towards greater efficiency of the Port and of its relationship with industrial land uses.

2. The basis of the transfiguration of fabrics

This riverside axis, while apparently dense due to the continuous urban fronts of marginal streets and the beach, is characterized by a delicate filigree of empty areas, apparently inaccessible from the public space, which is typical of the noble structures that distinguish it.

When the palaces and convents were built, they were micro urban structures with road extensions where their noble facades faced to, exposing themselves to the Tagus through small private piers, which have since been absorbed by successive port infills. These structures included distinct types of built structures, often quite erudite ones. Nowadays, we can still find cultivation areas and very interesting gardens within their fences.

As a result of the expansion of the Port to the east and west, smaller farms continue to exist, side by side industrial sites. This type of phenomenon is particularly relevant in Marvila, which from being a noble front has gradually become an industrial area, affecting the eastern area of the city until it was rediscovered thanks to Expo '98.

With regard to gardens and other *private areas* [Morgado 2010], the typologies of open spaces, whose structure and size contribute to the formation of the urban fabric, have been identified. In this case, private property with a project development and urban scale has been considered, and has now been included in the weaving of the city, such as parks, botanical gardens, and classical gardens associated with palaces and convents' walls. Its persistence is still visible in the military cartography of 1937 (*Instituto Geográfico do Exército* – Army Geographic Institute, series M888, page 431, scale 1:25 000) and in more detail in the cartography of Filipe Folque from 1856-58 (Morais Viegas, 2000) and of Silva Pinto, dated 1904-1911 [Morais Viegas *et al.* 2005].

They have been integrated into the group of monuments deemed to possess heritage interest. They have historical significance, for which reason they have been relatively maintained. Accordingly, albeit no longer having the original status of private places, especially by the end of the monarchy and the constitution of the Republic in 1910, they still exist and characterize the urban morphology.

The topographic features of the city and the predominance of water lines perpendicular to the shoreline and which flow into the Tagus from north to south, have

helped these estates stretch out in the same direction, combining the road fabric at its extremes and the water, notably through somehow complex infrastructures which enhanced their areas and allowed the cultivation of diverse species.

In addition, there was the parcelling running perpendicular to the shoreline, and where monasteries, palaces and pre-industrial port structures aligned together on the riverside path as far back as the fifteenth and seventeenth centuries. Coastal navigation was usual as the paved road network was virtually non-existent.

The abandonment of neglected palaces on the riverfront after the 1755 earthquake and tsunami which, besides ruin, brought great uncertainty to the population also pushed the former's noble uses into northern areas of the city, which paved the way for the gradual transformation of the eastern waterfront. Equally important, the Peninsular War (1807-1814) and subsequent civil war (1831-1834) brought a time of instability and economic difficulties, particularly in the first half of the nineteenth century.

This situation contributed to the delay in industrialization and in the implementation of mechanical infrastructures. The development process was only resumed with the advent of the *Fontismo* regime at the end of the nineteenth century, through the development of railway networks, national roads and the various *Planos de Melhoramentos Gerais* (General Improvement Plans).

The several stages of the *Plano de Melhoramentos*, which still included proposals advanced by Pezarat, are particularly noteworthy. These proposals highlighted the need to endow the capital with infrastructures, of which public lighting, road paving and water supply (for example, the connection between the Alviela Canal and the Barbadinhos water pumping station, among other hygiene-related measures) stand out as examples [França 2009].

As a result of the end of the civil war which opposed the constitutionalist party of Queen Maria II of Portugal and of her father, Emperor Pedro I of Brazil, to the Conservative party led by Miguel I of Portugal, religious orders were expelled and abolished in 1834. The newly established Liberal government allowed the use of empty buildings, especially monastic structures, and their appropriation for new utilizations in the city, such as public uses like hospitals, poorly adapted to households of industrial workers, and industries.

This has simultaneously contributed to the abandonment of gardened areas and to the rising density of public areas and gardens in the central areas of the city, alongside the building of annexes and precarious dwellings predominantly in areas where the working class, which had settled in the major industrial centres, lived. In this respect, the Alcântara and Chelas Valleys, which stood closely to the beltline and industrial centres adjacent to the port areas, played a key role.

In the nineteenth century, a filamentary structure of greater nobility developed along Rua da Junqueira, with the building of palaces such as the Burnay, the Câmara and the Águias Palaces, in the wake of older settlements such as the Lázaro Leitão Palace.

Industrialization brought about the enlargement and specialization of the artificial land fronts that resulted from the widening of the Port of Lisbon. The connection between the old beach road between the Belém monumental area, to the west, and the Alcântara stream with its *Tapadas* (royal parks usually forested for hunting and other leisure activities) on the nineteenth century edge of town, can still be seen today.

In its vicinity, in the area south of Monsanto, in the former municipality of Belém, there are several estates and royal palaces (Belém Palace and respective Estates). We find identical formations in some convent and monastery walls, of which the Jerónimos Monastery is a prime example, the remainder being already integrated into the consolidated fabric of Lisbon.

The particular conditions of the Belém Municipality contribute to its urbanization, in which open space, essentially erudite and private, plays a key role based on a former crown land (*Reguengo*) and on the parks (*Tapada*) that were then created. *Reguengo* was the name given to properties that belonged to the King and from which he collected rights and rents. They were obtained through the occupation of areas left free following the eviction of Muslims, and progressively eroded by large donations made to the clergy and the nobility. The *Reguengos*, created at the time of the founding of Portugal, became extinct in 1834, along with the Religious Orders.

As a royal land, and considering the subsequent construction and maintenance of urban and architectonic groups of some monumentality, this urban structure encompasses the Ajuda Royal Palace and the Belém Palace and respective gardens (*Real Jardim Botânico* – Royal Botanical Garden, for instance). They are structured along lines that unfold alongside important water lines (the *Ajuda* and the *Galvão Calçadas*) to which some buildings with specific characteristics are associated (there are several military barracks closely connected with these palaces).

This situation was further reinforced by important interventions resulting from the *Comemorações do Duplo Centenário* (Double Centennial Celebrations) and *Exposição do Mundo Português* (Portuguese World Exhibition) in 1940, of which some structures still exist, such as the Discoveries Monument (*Padrão dos Descobrimentos*) and the Colonial Botanical Garden, in direct connection with *Praça do Império* (Empire Square).

In the extreme east of Rua da Junqueira stands the *Real Tapada da Ajuda*¹, and in a symmetrical position with regard to the Alcântara stream and encompassing the

¹ *Tapada* means a forested type of green park that also belongs to the Crown or, in the case in question – Tapada Real da Ajuda and Tapada das Necessidades (Ajuda Royal Tapada and the Necessidades Tapada) – a green area, within the city boundaries, equipped for the pursuit of leisure activities and hunting, with distinct areas that include gardens and forest zones, as well as pavilions and other built structures. There were obviously areas of extremely limited access. Other recreational estates have their own private parks, which were represented in Silva Pinto's cartography.

upper and lower boundaries of the first inner ring road (*1ª Estrada de Circunvalação*), rises the *Tapada*² *das Necessidades* at the city's former borders.

As the numerous photographic sources of the Lisbon Municipal Photographic Archive attest, the *Real Tapada da Ajuda*² was the setting for frequent events, such as equestrian competitions, bird exhibitions and other royal family activities, like tennis matches and pigeon shooting.

The development of the city meant that the rural areas that preceded it underwent several adaptations. The persistence of farms in the urban fabric can be seen in the plots that provide a backing to the main farm houses, located in a privileged location with regard to the city's road network. The integration process into the new fabrics usually kept pre-existing links.

When incorporated into urban planning, they have played important roles in its functional polarization, normally by becoming equipment to residential areas or as areas and sights of interest in the urban landscape. The analysis of maps and plans shows that this phenomenon occurs explicitly in two plans by Faria da Costa: *Alvalade* and *Restelo*, the latter on the axis of the city's riverside.

These are areas of major significance in the context of the expansion of the city, publicly promoted in a previously expropriated area. In such an urbanization process, rustic parcelling was replaced by urban parcelling based on an urban plan that usually has formal characteristics. The Dukes of Cadaval Estate, specifically, was integrated into the design of the Restelo Neighbourhood, the same applying to the area around the 16th century Manueline *Jerónimos* Monastery, a continuation of the Jerónimos monastery wall, which was a very large estate whose boundaries were included in some of the roads. Thus, the *Restelo* Neighbourhood provides for a designed threshold off the westernmost end of the Municipality of Lisbon, focusing on a circular plaza at the site where once stood the *Algés* Bridge and Lisbon western gates.

3. Building artificial land

The various hydro-topographical charts show the advancement of the banks in *perret* technique over the Tagus canal and the golden-shimmered Sea of Straw, seeking the benefits of deeper canals, expanding the port activities areas also towards Vila Franca de Xira and *Algés*, with corresponding specialization in Barreiro, Seixal and Almada.

Standing opposite the Sea of Straw (*Mar da Palha*), the cartography depicts a frontline of buildings with architectural quality and aesthetic diversity, shaping

² This is a Botanical Park with about 100 ha which houses the D. António Xavier Pereira Coutinho Natural Botanical Protected Area, where several species from the area are represented, alongside gardens, tree nurseries, crop lands (orchards, vineyards, meadows, cereal crops and vegetables) and several domestic and wild species.

unique public spaces that mediate the urban space and the Tagus. The cartography comparing the riverfront prior to 1755 and the riverfront at the time of the survey carried out by Filipe Folque, which included the works executed up to 1960, is particularly telling (*Orla Marginal da Cidade de Lisboa*, APL [undated; no author]). As an example of this particular feature, special emphasis was given to the transformation of symbolic urban spaces, particularly through interventions of an erudite nature, with emphasis on the *Praça do Comércio* through the *Cais das Colunas*, which was the former *Terreiro do Paço*, and thus a reminiscence of the former royal palace. In similar fashion, though less important, one can mention the old Pier of *Belém* Palace or the one belonging to the Marquises of Angeja in *Junqueira*, both gone as a result of the infills made for the Port of Lisbon.

Complementing the docks and enlargements, fortified structures also surrounded the city (e.g., the Estrela Fortress, at what is now *Rua da Junqueira*). This focus on the transformation of the port was particularly intended to transform the banks, which, at the time, were partially natural with their beaches and muddy areas (the famous *Caldeira do Moinho*, a muddy area with a tidal mill in *Alcântara*, for example) into extensive areas of infills and docks, which initially were made in the west section of the river front between *Algés* and *Santo Amaro*: *Bom Sucesso* Dock, the *Belém* Dock, the *Junqueira Perret* and *Santo Amaro Dock* (from 1890 to 1895).

The *Alcântara* Dock (1887-1905), in turn, encompassed a longer period that was also more complex due to the characteristics of the site and the complexity of an important infrastructure node in conjunction with the railway belt. Between 1900 and 1905 it stood as the most symbolic waterfront of Lisbon and the target for intervention, as shown by the construction of the *Santos* and *Ribeira* Quays, the *Marinha* Dock, the *Terreiro do Trigo* Dock and the *Santa Apolónia* Quay Wall.

The well-known Boa Vista infill partially preceded these transformations, and was equally used as a public promenade, which was fundamental in hygienic terms, as the muddy banks of the river were a key focus of the 1857 yellow fever.

Subsequently, the expansion of the Port of Lisbon included the strengthening of its docks, especially the *Alcântara* Dock, as well as expansion towards *Olivais*, which went hand in hand with the works for the construction of an artificial canal.

This construction of artificial land extended towards the northeast through the creation of new port areas to *Cabo Ruivo*, passing through *Marvila*, *Braço de Prata*, *Matinha* and *Poço do Bispo*, bringing about intensive heavy industry, the *Olivais* and *Cabo Ruivo* docks, and a new dredged canal, which profoundly changed the eastern riverfront of Lisbon.

This was actually significant with regard to port structures, and contributed to an industrial and working-class type of urban development. It made one of the extremities of the Chelas valley more compact and watertight, gradually isolating itself from the urban fabrics with higher quality in terms of urban project (*Alvalade* and eastern *Areiro*).

Included in the parish of *Santa Maria dos Olivais*, the *Cabo Ruivo* area comprised the Petrogal refinery, the Gas Plant, the reservoir, and the Olivais pumping station and surrounding area. It also had the first dock for hydroplanes in Portugal, used especially during the colonial war.

Their subsequent decommissioning released this strategic area for new uses and for the requalification that was carried out as part of the Expo '98 project, now called *Parque das Nações*. This is an emerging central zone in the Lisbon metropolitan area, primarily because it is expected that the Oriente railway station will become Lisbon's station for the high-speed train.

Previously, the *Plano de Ordenamento do Porto de Lisboa* – Lisbon Port Authority Plan [APL 1995] had played a key role in qualifying these areas, now heavily devoted to leisure, where the new public space areas unveiled new open space areas in city.

Following the gradual transfer of management of riverfront areas, formerly under the jurisdiction of the *Administração do Porto de Lisboa* – Port of Lisbon Management Board/APL, to the municipality of Lisbon due to a growing urban vocation, urban projects have been complementing previous interventions. In this context, the *Plano Geral de Intervenções da Frente Ribeirinha de Lisboa (Lisbon waterfront comprehensive plan)*, 2008, promoted by the Lisbon Municipality, has attempted to coordinate a set of projects of vital importance to connect the port area and the city of Lisbon, and include structural plans, such as the *Alcântara Master Development Plan* (Fernandes de Sá Lda) and the *Master Development Plan* for the area around *Gare do Oriente – Oriente* Train Station (Joan Busquets).

Some of these areas relate to projects that are part of the *Sociedade Frente Tejo*³ (Tagus Riverfront Agency), whose mission is to promote and implement a joint action of urban redevelopment and rehabilitation in intervention areas called *Frente Ribeirinha da Baixa Pombalina* and *Ajuda-Belém* [Frente Tejo 2009].

The planned measures are based on urban projects in which functional diversity, the coordination of infrastructure and open public space are considered to be pivotal, in close connection with other areas and uses.

4. A paradigm shift in the urbanism of the city?

The recent revision of the Lisbon Municipal Plan (in force since 2012) has aired new perspectives on the design of the city in the first decade of this century, enabling the establishment of an urban structure plan. Built after elements with urban and environmental qualification, in which open space is a key constituent in planning, it focuses on situations of cleavage and interface between different types of occupation. This approach could allow a more functional and spatial coherence, overcoming discontinui-

³ Decision No. 78/2008 of the Council of Ministers, published on 15 May, and pursuant to Decree Law No. 117/2008 of 9 July.

ties stemming from merely strategic or zoned proposals which called for more detailed plans to solve often discontinuous solutions that were untimely or never performed.

The identification of five new centres to be developed (*Alcântara, Sete Rios, Praça de Espanha-Rego, Chelas/Parque Hospitalar Ocidental* and *Estação do Oriente*), to be anchored on the railroad line and integrating the open space project as a core element, will make it possible to tie existing infrastructures and their fringe areas to the more compact city.

The current Municipal Plan for the city, allow already to elicit a possible paradigm shift in the approach to the idea of the city. It is one that finally integrates open space in its *project and production* variants as an element of spatial and functional continuity, quality landscaping, and has strong social value for the city's populations.

In addition, the waterfront has been revived in very interesting ways, by means of redesign for public space specially in areas once restricted either by military, naval or port activities and respective jurisdiction. In fact, these are lines of development the artificial land provided only given now to a public use, with an interest in design for all, soft mobility, cultural and innovation development.

From east to west, we may refer the recently inaugurated Cruise Ship Terminal, to the rehabilitation and provision of urban continuities near the historical *Terreiro do Paço* and, towards the Costa do Sol, the eye-catching Museum of Carriages, MAAT/ Museum of Architecture, Arts and Technology, the well-known Champalimaud Centre for the Unknown, pioneer in cancer research, just to name a few.

Most of this was designed by world renown architectural, landscape and urban design teams; however, what brings them together is a more consistent vision on the development of the City. The conjunctive tissue that weaves the city throughout time is what Urbanism is all about.

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