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Incremental Public Space Networks as Metropolitan Infrastructures Towards Urban Resilience and Cohesion: Decoding Best Practices in Lisbon, Portugal

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ABSTRACT

The paper offers a systematized perspective on a selection of complex public space projects delivered in Lisbon metropolitan area, through which three key rationales are discussed: 1) promotion of environmental resilience through green and blue infrastructure networks, 2) promotion of low-carbon mobility through improved conditions for walkability, active modes and access to public transport, 3) promotion of territorial cohesion through better connected and more cohesive neighborhood public spaces. Concluding remarks and contributions reveal the lessons learned on how each project's rationale and systemic articulation complement each other, as well as the future prospects in terms of assemblage mechanisms towards an incremental logic of public space development.

Keywords: Public space, Urban project, Metropolitan planning, Lisbon

INTRODUCTION

Public space is widely acknowledged as a fundamental structure of urban space, giving shape to the most persistent elements of urban form, providing a diverse range of services and a potent tool to engage with urban transformation (Clos, 2016, AAVV, 2018, Gray and CCCB, 2015). It also seen as a common ground on which social, economic and political dimensions intermingle, as a mirror of the societal organization, through its legal and normative arrangements, but revealing its tensions under multiple claims of property, use, access, and representation (Carmona, Magalhães and Hammond, 2008). Existing literature from the social and political sciences has mostly addressed these issues under the lens of social and cultural practices and the political construction of urban space and its role for sustainable urban development (Andersson, 2016). Another important field of research has addressed the role of public space under the lens of its ecological, infrastructural and morphological characteristics, hence highlighting its physical and material configurations, as part of wider spatial structures

(i.e. urban fabrics, cities, ecological networks) (Shannon and Smets, 2010, Coelho, 2017, Battle, 2018). Nevertheless, besides design-oriented exploration (Solà-Morales, 2010, Secchi and Viganò, 2009, Cavalieri and Viganò, 2020), there has been limited approach to the forms and processes in space and time through which large urban areas – metropolitan areas and urban conurbations – have used public space as a multidimensional and 'designed' infrastructure in a coherent and multi-scalar approach. Such approach is the core hypothesis through which 'MetroPublicNet – Building the foundations of a Metropolitan Public Space Network' research project is addressing the experience of public space qualification projects in Lisbon Metropolitan Area (LMA), Portugal, since 1998, looking at their rationale, impact and potential to shape a future metropolitan public space network (Santos and Matos Silva, 2021, Matos Silva and Beja da Costa, 2022, Santos and Carvalho, 2022). This paper presents one of MetroPublicNet's methodological steps – the selection, decoding and discussion of several case studies in LMA – and discusses their relationship with urban planning rationales and potential for incremental development into a cohesive metropolitan network.

24 CASE STUDIES: CRITERIA, RATIONALES, AND SYSTEMIC DECODING

From a database of over 900 identified public space qualification interventions in LMA since 1998, twenty-four case studies was selected as relevant examples to better understand specific characteristics. Their choice was the combined result of four main criteria: 1) diversity in terms of location (at least 3 per each of LMA's 18 municipalities), type (i.e. street, plaza, green park, waterfront, etc.) and opening date, 2) diversity of spatial and programmatic complexity, 3) presence and/or potential for incremental (phased) development, 4) relevance as showcase of recurrent approaches in each of the three main rationales: i) green and blue infrastructures, ii) walkability and low-carbon mobility, iii) connected and cohesive neighbourhoods. In each case study, the fundamental rationales and policy goals behind their planning and funding are identified, allowing for a critical framework to assess their impact and contribution towards topical urban and territorial challenges.

Graphical Decoding: Revealing Public Space Systems as Layers

Each case study was graphically decoded and interpreted through a research-by-design approach. Figure 1 offers a selection of a comparative table of six case studies, in which six themes are identified for each case: 1) location of intervention, 2) landmarks and collective urban facilities, 3) mobility and accessibility, 4) green structure, 5) ground level porosity. The developed cartography allows for a comparative and synthetic decomposition of structural urban and territorial systems that coexist and integrate in public space. Figure 2 presents a more detailed representation of the projects developed in Vila Franca de Xira's riverfront, one of the case studies, as an example of a complex and incrementally networked public space qualification process. Located on a riverine municipality north of Lisbon, it includes projects related to 1) pedestrian and cycle paths along Tagus river, with planned links

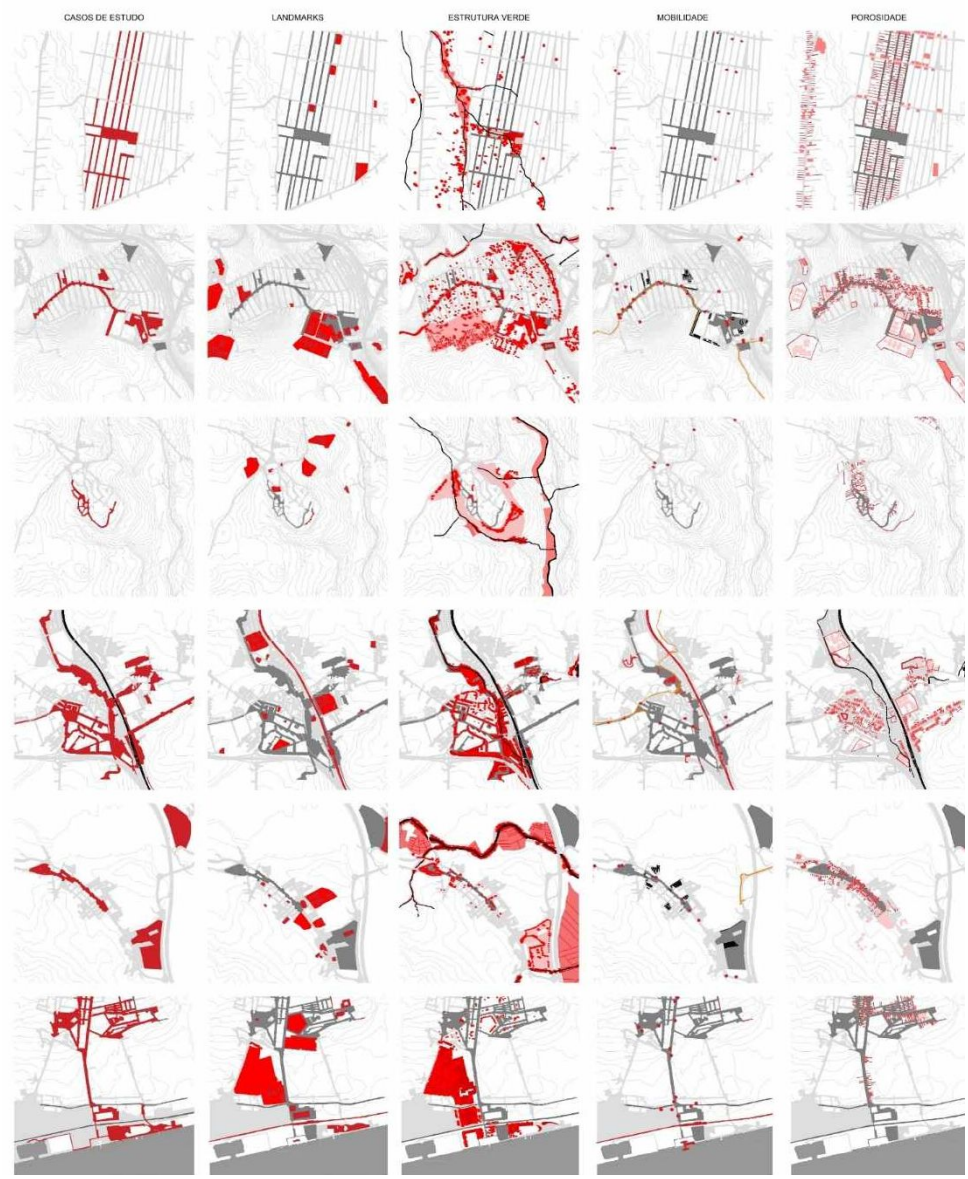

Figure 1: Example of comparative table of case study systematic decomposition. From top to down: Fernão Ferro (Seixal), Brandoa (Amadora), Leceia (Oeiras), Cacém (Sintra), Loures (Loures), Ajuda (Lisboa). (source: authors.)

to Lisbon's riverfront, 2) redesign and urban integration of a national road as pedestrian friendly infrastructure, and 3) transversal connections to dense suburban residential neighborhoods, in which local community agriculture was promoted to actively reuse interstitial spaces.

Public Space Types and Planning Rationales

Following the case study outline, an interpretative matrix offers a combined lens through which different types of public space intervention (i.e. linear

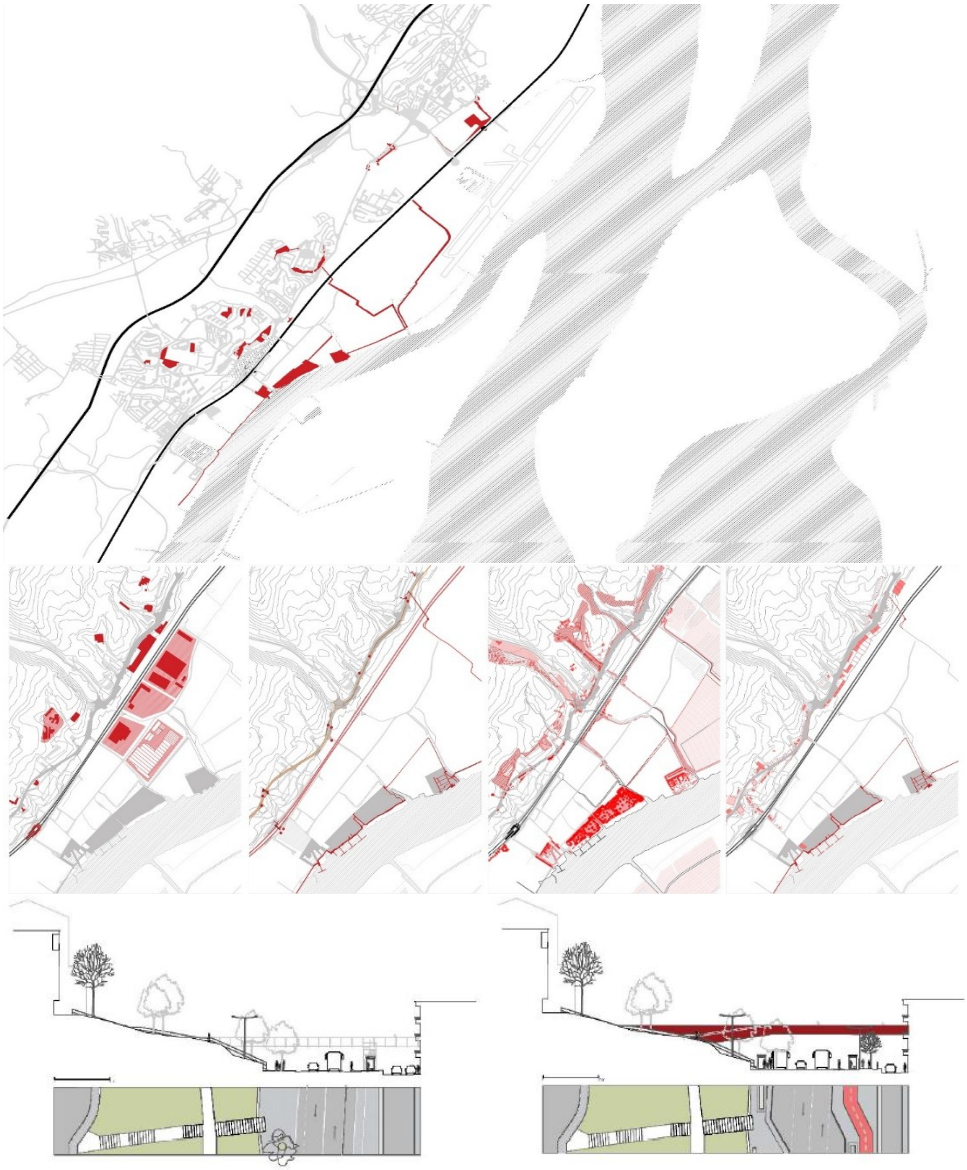

Figure 2: Example of case study decomposition – Vila Franca de Xira / Tagus riverfront parks and N10 national road. Above: location of public space interventions; centre: systemic decomposition; below: before and after public space intervention schematic section. (source: authors.)

parks and ecological corridors, waterfront renewal, street re-profiling and sidewalk extension, local square revitalization, etc.) integrate planning rationales and goals. Table 1 offers a global perspective on the association of public space types and the prevailing rationale for each case study. The more complex and integrated interventions show the capacity to bridge different rationales and public space types (i.e. Sintra – Cacém urban requalification). However, even the simpler projects in terms of physical transformation, may deal with complex territorial and social situations, as in the.

Table 1. Case studies matrix: 1) project rationale and 2) type of intervention (source: authors).

	Project rationale				Types of public space intervention						
Case studies	Blue & green infrastructures	Active mobility & walkability	Neighborhood connection & cohesion		Streets, roads, cycle paths	Squares and plazas	Green spaces	Stream & stormwater solutions and urban agriculture	Transport hubs and dedicated lanes	Reorganization of parking	Coastal and river waterfronts
Vila Franca de Xira - Luís C. Pereira Park and Santa Sofia valley	■				■		■	■			
Vila Franca de Xira – Tagus riverfront parks and N10 national road	■	■			■		■				■
Mafra – Ribeira D'Ilhas and Foz do Lizandro beach amenities	■	■			■					■	■
Loures – R. República, R. Guilherme Fernandes, Av. Moscavide		■	■		■	■					
Odivelas – Serra da Luz and Vale do Forno	■	■	■		■	■	■				
Amadora – Brandoa neighborhood		■	■		■	■	■				
Amadora – Zambujal neighborhood			■		■	■					
Sintra – Algueirão-Mem Martins linear park	■	■			■		■	■			
Sintra – Cacém urban requalification	■	■	■		■	■	■	■	■	■	
Oeiras – Leceia neighborhood		■	■		■						
Sintra/Oeiras/Amadora – Green & Blue Axis	■	■			■		■	■			
Cascais – Tires/Manique roads		■			■						
Lisboa – Central Axis		■			■	■					
Lisboa – Ajuda neighborhood		■	■		■	■					
Lisboa – Riverfront	■	■			■	■				■	■
Almada/Seixal – Sobreda and Corroios Parks	■				■		■				
Almada/Seixal – MST tram		■			■	■			■		
Seixal – Fernão Ferro		■	■		■						
Barreiro – central streets		■	■		■	■			■	■	
Moita – Av. 25 de Abril, R. 1º de Maio		■			■						
Montijo/Palmela – Bicycle path Montijo-Pinhal Novo		■			■						
Alcochete – riverfront	■	■			■	■					■
Sesimbra – Quinta do Conde Parks	■				■		■	■			
Setúbal – central city streets and Várzea Park	■	■			■		■	■	■	■	

Cascais – Tires/Manique roads, where pedestrian and bike lanes were added to created active mobility conditions in highly fragmented urban areas; and in the Amadora – Zambujal neighbourhood, where civic spaces were requalified in an economically deprived areas thus offering a more dignified, cohesive and better connected urban environment.

Towards Resilience and Cohesion Through Incremental Project Strategies

Each case study is going through an incremental process of public space qualification interventions, mostly promoted and delivered by local municipalities across time, providing stronger linkages and continuities in relatively heterogeneous and splintered territories, such as those of Lisbon and many other contemporary metropolises. This analytical framework is a useful tool to identify relevant tools of metropolitan spatial redevelopment and regeneration based on the incremental development of multiple forms of public space. Following MetroPublicNet's main research hypothesis, public space's contribution to metropolitan resilience and cohesion stems primarily from the networked assemblage of multiple interventions, more expressive in those related to green and blue infrastructure, thus creating a systemic and coherent frame with greater impact on the whole than merely on the individual parts. With this in mind and having in consideration the processes identified in each case study and a more general perspective on recent metropolitan development in Lisbon, a framework that reinforces incremental public space development strategies was devised (Table 2).

Table 2. Incremental strategies identified in the case studies (source: authors).

	Linear continuities		Distributed network of nodes			Passages and porosity			Selective and asymmetrical differentiation			Landscape references / collective identity	
Case studies	streets, urban axes and mobility	ecological corridors	railway stations and public transport	metropolitan facilities	local urban facilities	Combination of public and built space	Connections over infrastructure and physical barriers	Exploration of interstitial and transition spaces	Basic infrastructure	links to physically segregated neighborhoods	growth of commercial and economic activities	historic districts and heritage	landscape features
Vila Franca de Xira - Luís C. Pereira Park and Santa Sofia valley													
Vila Franca de Xira – Tagus riverfront parks and N10 national road													
Mafra – Ribeira D'Ilhas and Foz do Lizandro beach amenities													
Loures – R. República, R. Guilherme Fernandes, Av. Moscavide													
Odivelas – Serra da Luz and Vale do Forno													
Amadora – Brandoa neighborhood													
Amadora – Zambujal neighborhood													
Sintra – Algueirão-Mem Martins linear park													
Sintra – Cacém urban requalification													
Oeiras – Leceia neighborhood													
Sintra/Oeiras/Amadora – Green & Blue Axis													
Cascais – Tires/Manique roads													
Lisboa – Central Axis													
Lisboa – Ajuda neighborhood													
Lisboa – Riverfront													
Almada/Seixal – Sobreda and Corroios Parks													
Almada/Seixal – MST tram													
Seixal – Fernão Ferro													
Barreiro – central streets													
Moita – Av. 25 de Abril, R. 1º de Maio													
Montijo/Palmela – Bicycle path Montijo-Pinhal Novo													
Alcochete – riverfront													

CONCLUSION

The research process highlighted three main contributions: 1) a visual/graphical interpretation matrix through which different public space interventions are consistently represented in their multi-dimensional character, 2) a relational approach between the programmatic rationality and the typological diversity of public space projects, and 3) a prospective toolbox to incrementally assemble multiple interventions into coherent and multi-scalar public space networks. Focusing on the latter two, it is possible to see the potential of *linear continuities* as particularly useful to promote more resilient ecosystemic features associated with green corridors, biodiversity flows, water stream restoration, and flood prevention, while also useful in terms of active modes of mobility. The logic underpinning a *distributed network of nodes* is relevant when considering the mobility-land use nexus, by creating a more equative and consistent coverage of transport hubs in strategic locations as well as complementary distribution of collective urban facilities. The use of *passages and porosity* strategies are important to foster active mobility modes, by decreasing the effect of spatial barriers and promoting accessibility for all, thus promoting social cohesion. *Selective and asymmetrical differentiation* can be better suited for achieving positive discrimination in terms of investment aiming at social cohesion, prioritising areas lacking basic infrastructure and creating connection to often splintered socially deprived districts. Finally, bringing qualified public spaces to *landscape references and collective identity* areas can have a relevant impact on the cultural and

political dimensions of planning and governance, creating a more aware, demanding and participatory metropolitan community.

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