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Doctoral Dissertation

Doctoral Program in Architecture. History and Project (37<sup>th</sup> Cycle)

# **The evidence of the city**

Evidence-based approaches in urban design practice

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# Summary

As society keeps moving towards unprecedented levels of urbanisation, cities are explored as sources of solutions for the challenges that the urbanised world poses. The New Urban Agenda presents urban design as one of the five pillars that can help implement principles to improve the quality of urban life, and suggests evidence-based approaches as valuable methods to provide higher degrees of predictability to city plans and policies (United Nations, 2017).

Evidence-based approaches in design fields are described as operational models where credible and reliable facts, research findings, and field observations inform the choices taken by designers (Hamilton and Watkins, 2009). The evidence-based approach proposes a rigorous method of application of a broad source of evidence, including theoretical, practical, empirical, and scientific evidence, as all possible sources for project decisions. The implications of these ideas - from the need to establish what constitutes reliable evidence to the significance of merging analytical approach to intuitive design - inform the underlying question of this work of research: what are the possibilities and limits of an evidence-based *urban design* model? The implications of this question are identified at the crossing of the discourse on evidence-based design and the theories of urban morphology, consequently addressing the gap between the morphological theories and their practical application. While the discourse on evidence-based design has been facing rising interest in the architectural and urban environments, urban morphology has been undergoing an extended operational crisis, for which several proposals claim for the construction of a process “*where rigorous morphological analysis supports the design of plans and projects, that are evaluated (including assessment of different design alternatives) and monitored throughout implementation and construction, bearing in mind the major needs and aspirations of both citizens and cities, in times of limited resources*” (Oliveira, 2021). As a definition closely related to the evidence-based framework, and considering the urban morphological theory

and Space Syntax's analytical methods, this research relates the two fields in a codependent manner.

The inquiry employs empirical case-study methodology to address the research gap, analysing three urban design projects selected from a pool of design firms whose methods fall within the evidence-based approach, either explicitly or implicitly. The three projects are all cases of brownfield redevelopment with urban-scale objectives of renewed accessibility, centrality and connectivity with the surroundings, and for which they apply spatial modifications on all elements of the urban morphological project – the lot, the streets, and the buildings. They are the Theater District Neighborhood in San Diego University College by HKS Architects, the Ruzinov Project in Bratislava by ERA-Co and WoodsBagot, and the Banegraven Project in Aarhus by C.F. Moller, developed in collaboration with Gehl Architects. Each case is analysed descriptively, through the use of documentary sources provided by the firms, and morphologically, using the spatial analytics of Space Syntax Toolkit on QGIS. For this, each city's pedestrian street network around the project site is digitally modelled using OpenStreetMap data. The analytical lens of Space Syntax is limited to the evaluation of these designs in terms of configurational characters, but for such theoretical specificity, the method is deemed valuable as it returns a qualitative and quantitative understanding of the capacity of each project to accomplish its set urban objectives.

Comparison of the three empirical studies demonstrates that evidence at the urban scale does not follow a hierarchical logic to guide the morphological choices. For this, the thesis introduces three categories of evidence to differentiate their epistemic role in the design process: descriptive evidence, comparative evidence and predictive evidence. It is argued that all three are data collected in function of the design hypothesis, but support it to three extents, making the overall design either evidence-inspired, evidence-informed, or evidence-based. This theoretical refinement informs the definition of evidence-based urban design, proposed here as a *traceable design method which generates predictive evidence from qualitative and quantitative evaluation of morphologically different design iteration*.