Typifying the city with pan-European open data

A geospatial workflow for identifying modular urban form types as a planning-support tool

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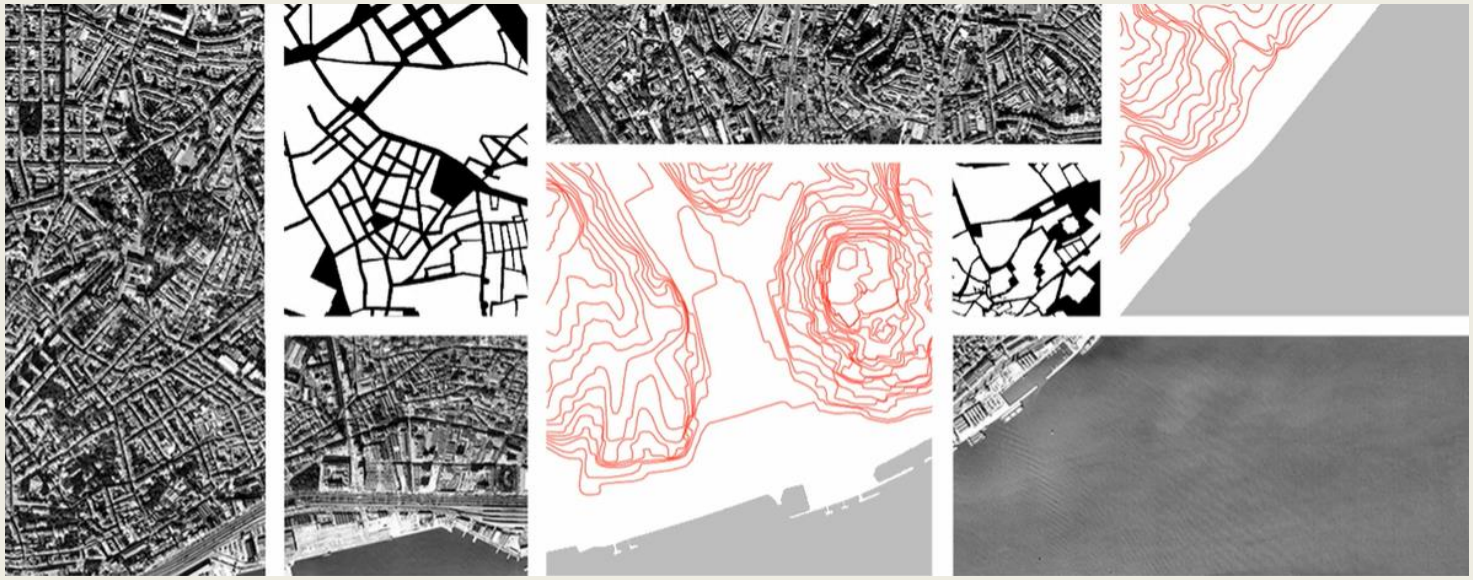
Urban form types

- We will focus on exploring the typologies of three elemental components of urban form *(Smailes, 1953; Lozano, 1990; Cowan, 2005)*: **1/ built density, 2/ network centrality** and **3/ functional mixture**

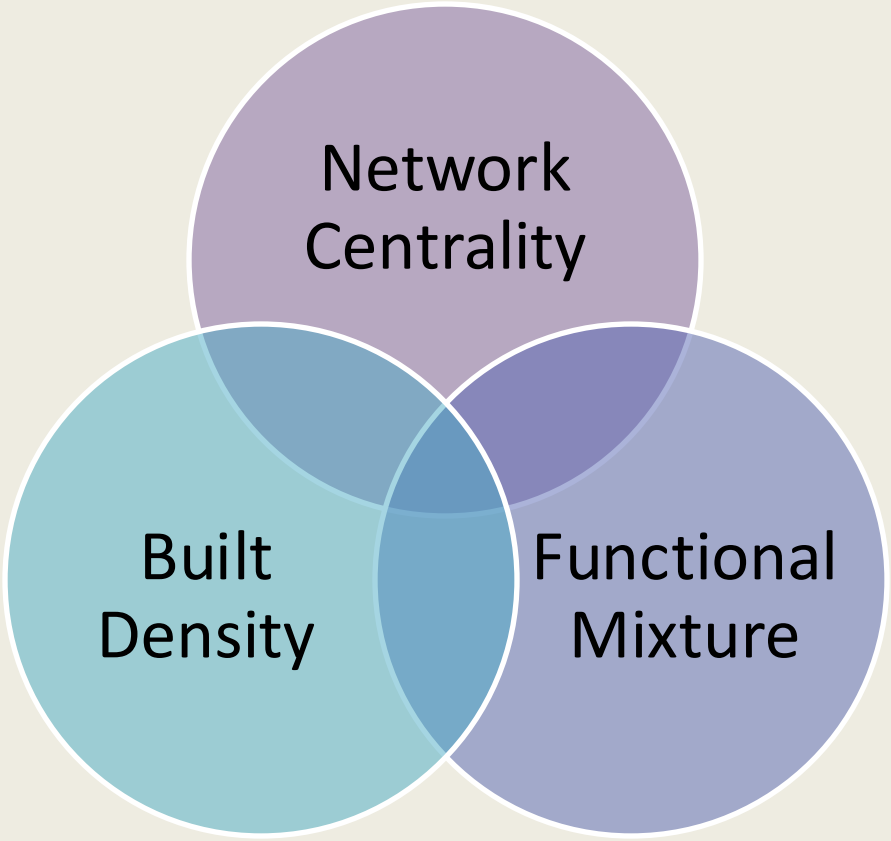


Source: *http://formaurbislab.fa.ulisboa.pt/indexEN.html*

- These three elemental components have been **used extensively in relevant research exploring urban form types**: *Berghauser Pont, et al., 2019a; Berghauser Pont, et al., 2019b; Bobkova, et al., 2019; Ye, et al., 2017)*

Spatio-functional urban types:

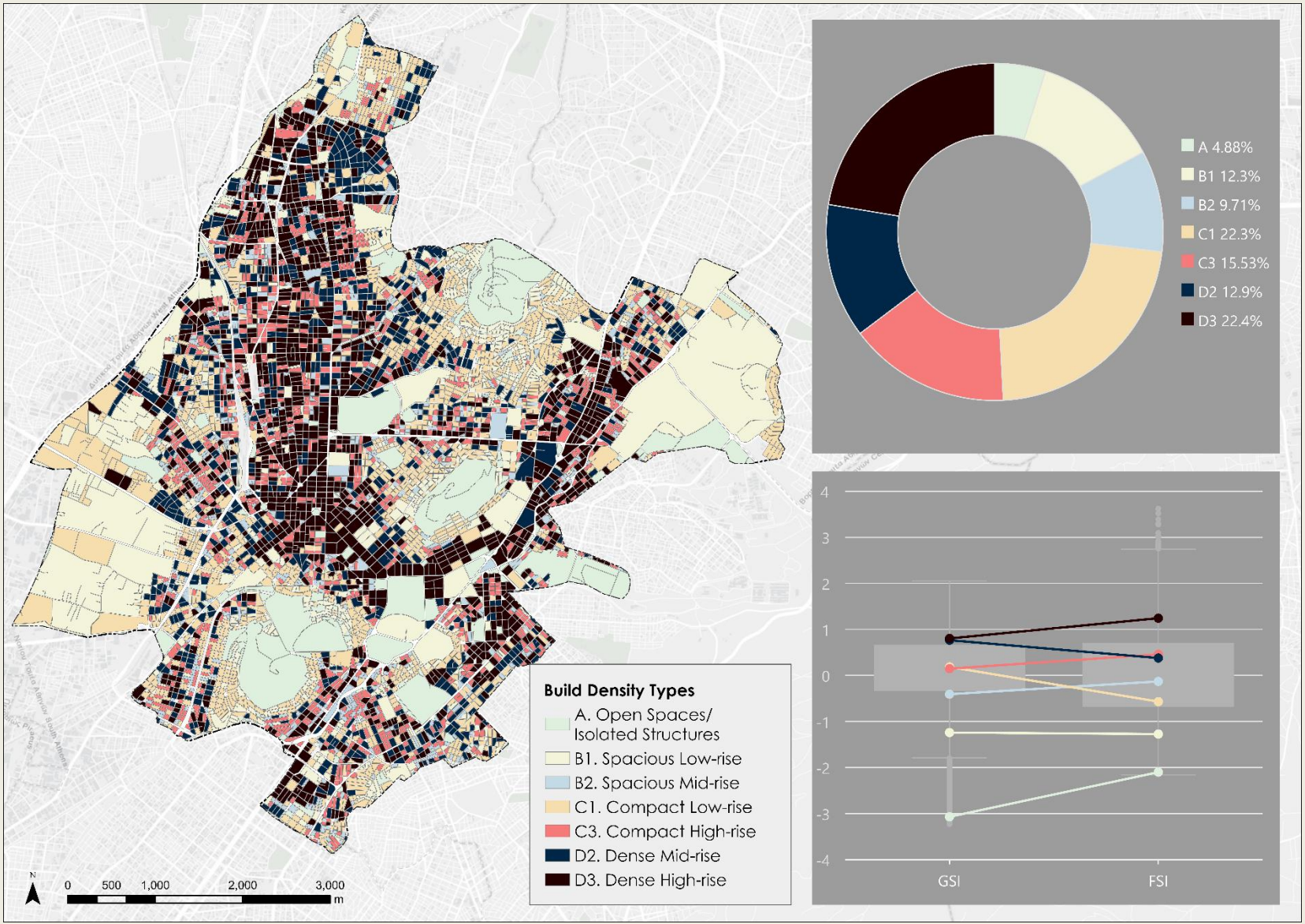
Addressing Form + Function,
through an open-data geospatial methodological framework



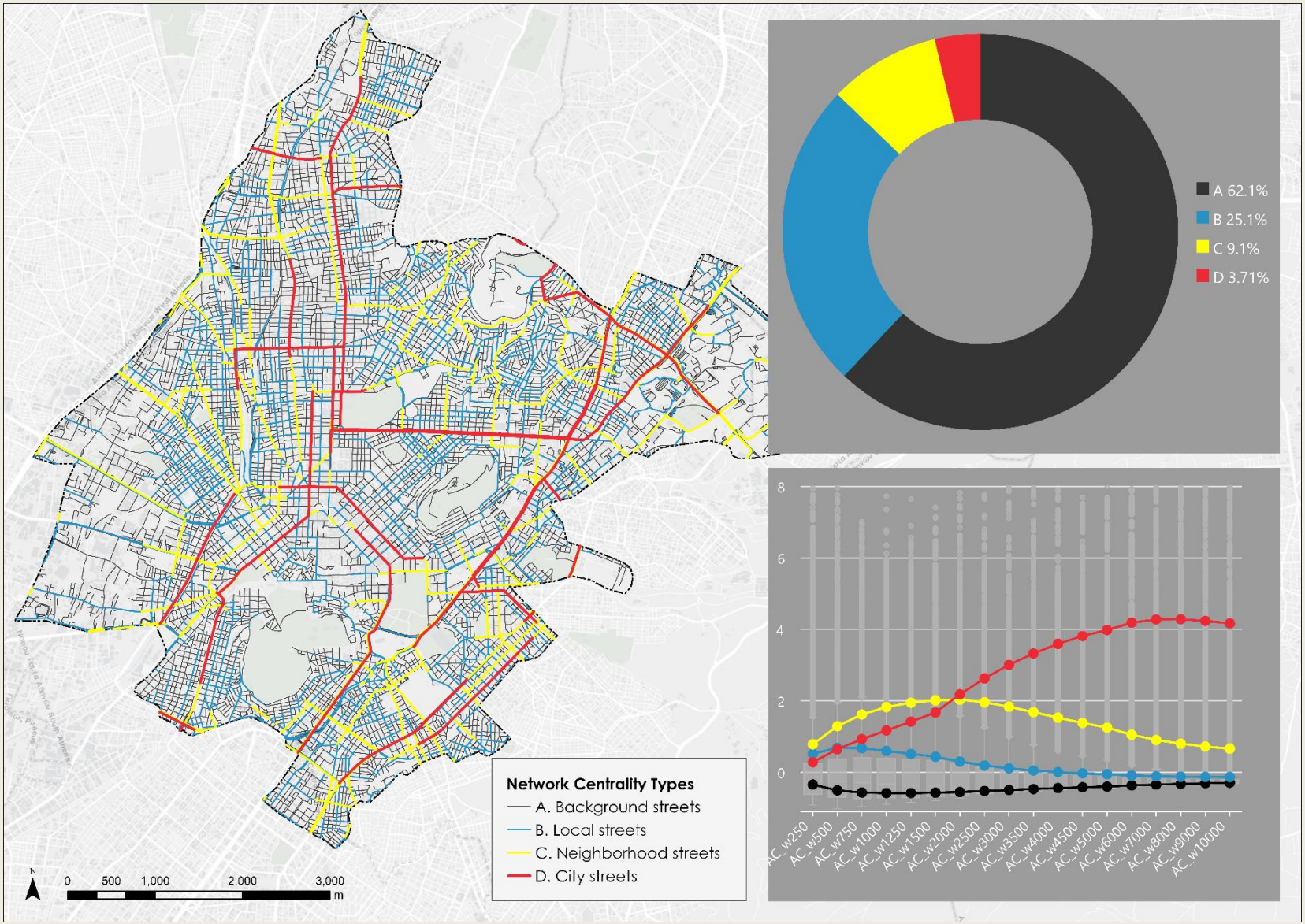
Conceptual and Technical Framework (1st Iteration)

Analytical Pillar	Analytical Component	Morphological Definitions	Spatial Unit	Data Source | Dataset
Built Density	***Ground Space Index (GSI)***	• Spacious, • Compact, • Dense	Urban Block	Urban Atlas | Building Height
	Floor Space Index (FSI)	• Low-rise, • Mid-rise, • High-rise		
Network Centrality	***Angular Choice 250m-10km*** *Low, Medium, High radii*	• Background • Local • Neighborhood • City	Street segment	OpenStreetMap | roads
Functional Mixture	***Population Density*** ***Functional Density***	• Sparsely populated residential blocks • Active Residential blocks • Residential activity nodes • Non-Residential activity nodes	Urban Block	Urban Atlas | Population estimates by Urban Atlas polygon OpenStreetMap | Points of Interest (pois) OpenStreetMap | Places of Worship (pofw)
	Functional Diversity	• multi-dimensional; • uni-dimensional		
	Density of Public Open Spaces	• with public open spaces; • without public open spaces		

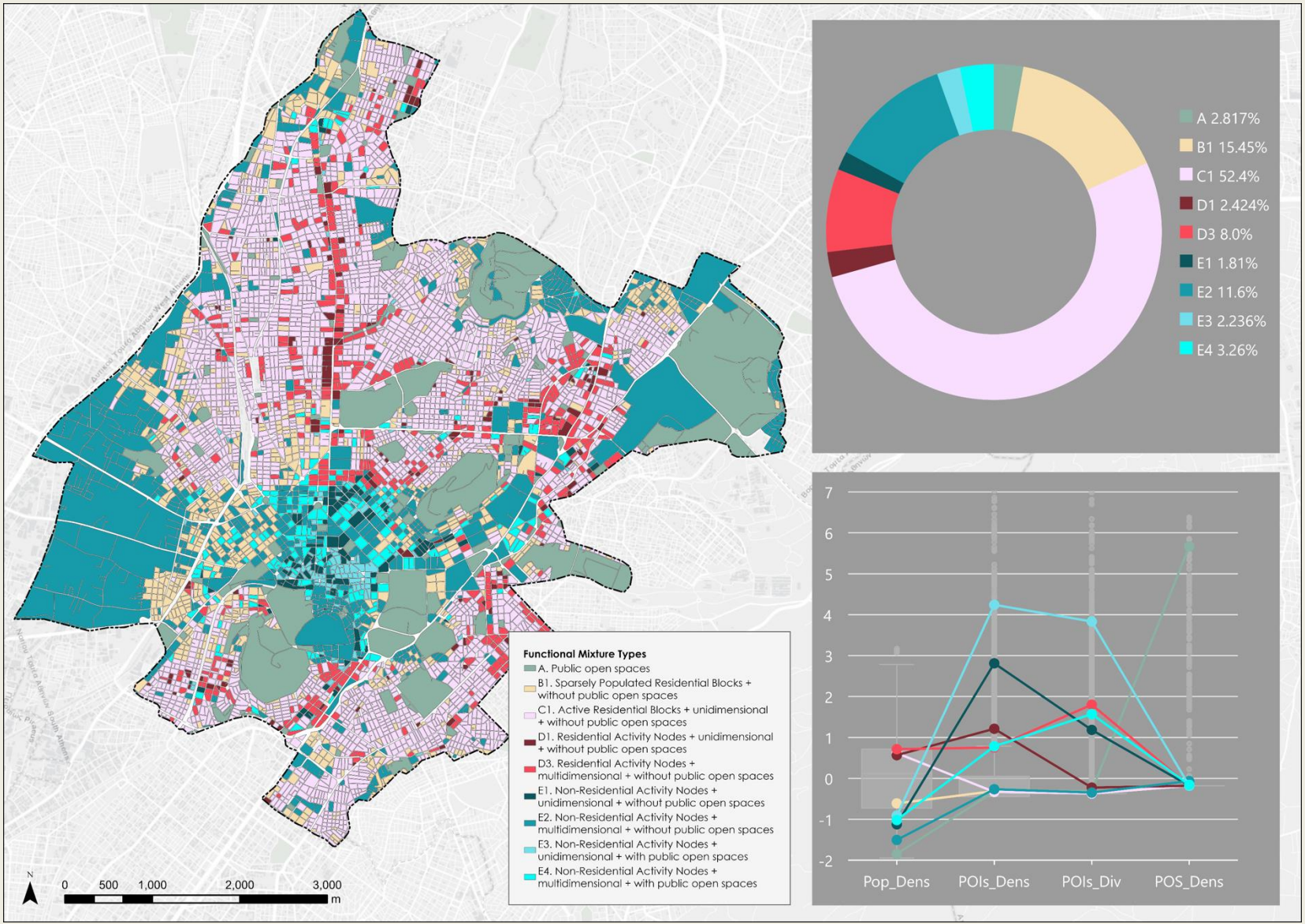
Athens's types of built density – Key Results (1st Iteration)



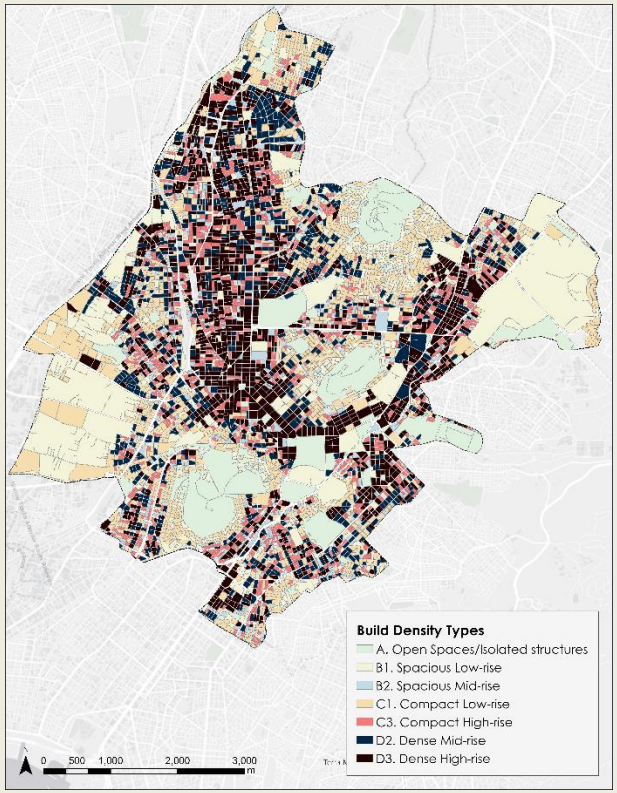
Athens's types of network centrality – Key Results (1st Iteration)



Athens's types of functional mixture – Key Results (1st Iteration)

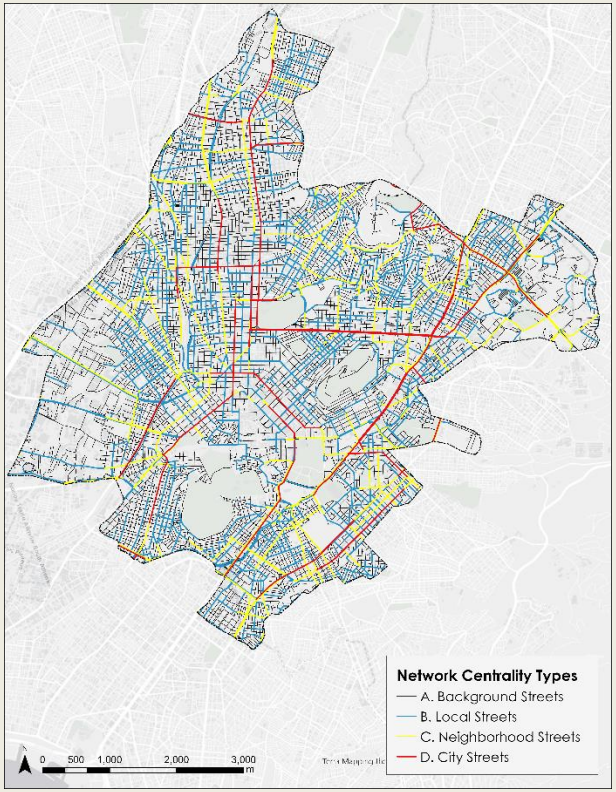


Urban form types and some open-ended questions



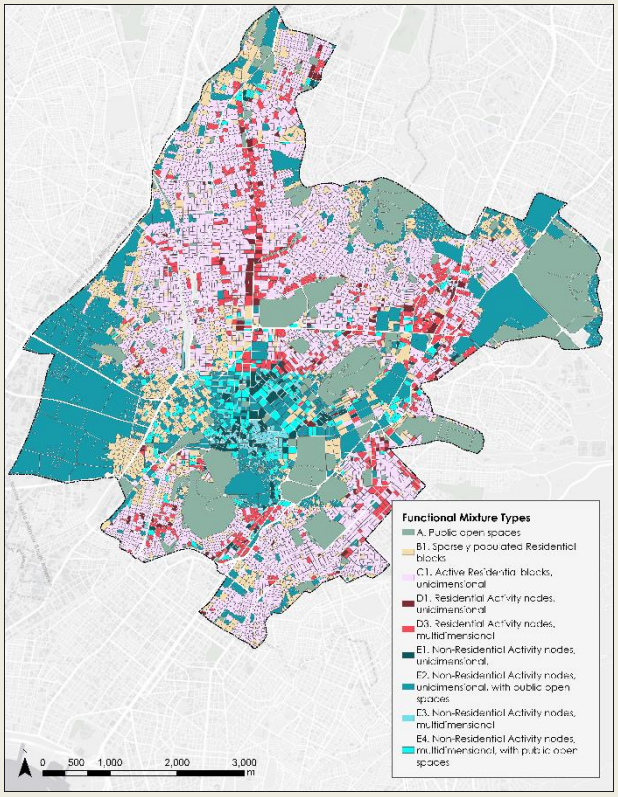
Patterns of build density

Proxy for socio-cultural patterns and processes for production of space?



Patterns of network centrality

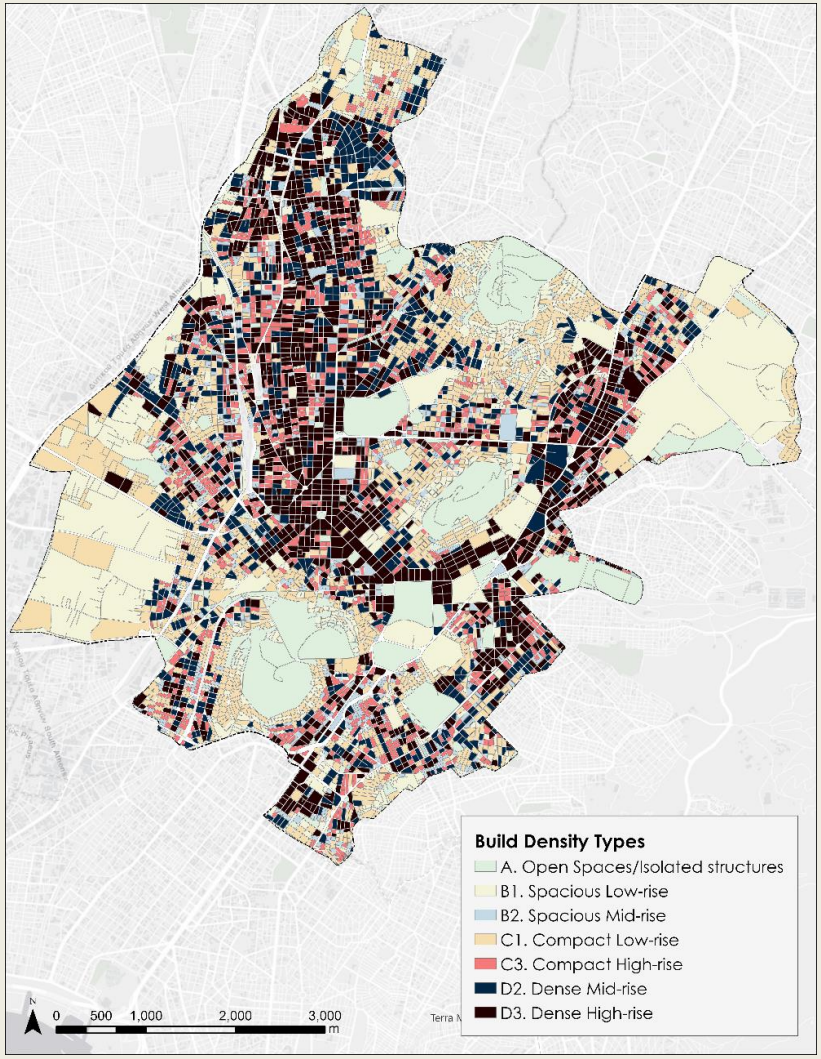
Proxy for urban mobility, quantifying human mobility with different modes ?



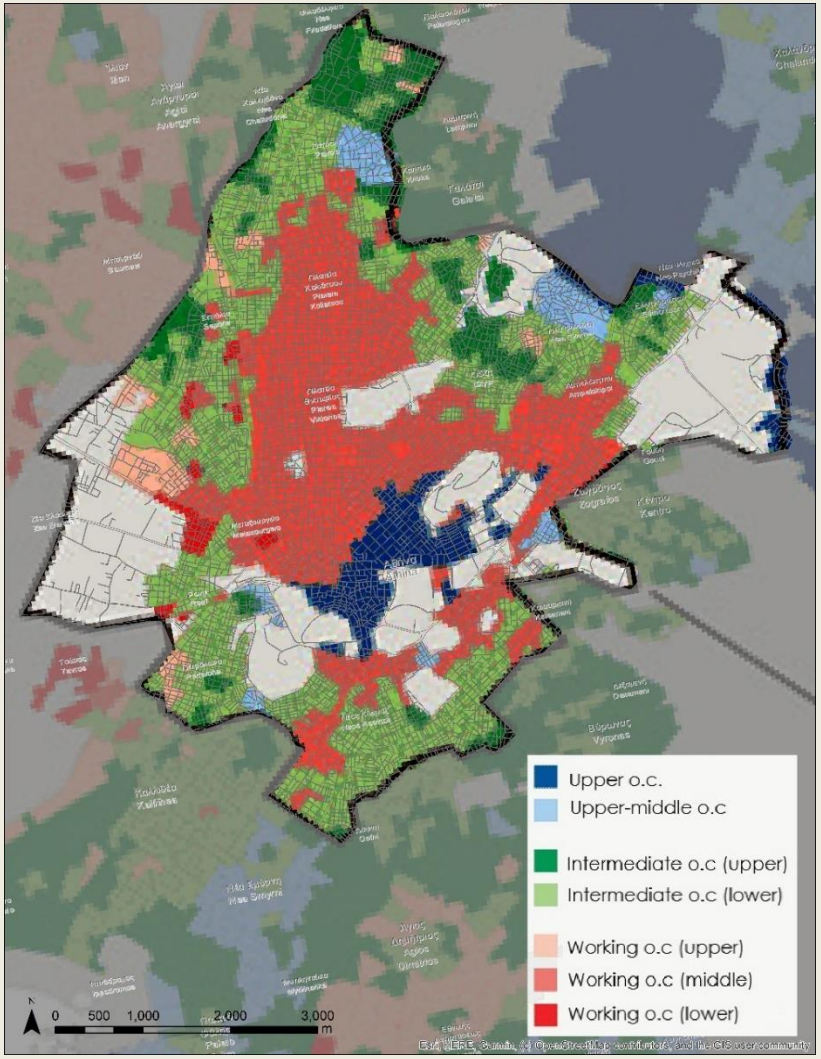
Patterns of functional mix

Proxy for urban activity and human practices in the urban space?

Urban form and Social form types



Build density typology



Social typology of residential areas (Maloutas & Spyrellis, 2019)

Next Steps (?)

This is the first implementation of our open-data methodology for identifying urban types, and further research is definitely needed. Such as:

- **Rethinking the analytical components**: e.g. Network centrality for Motorized and Non-motorized network → For active and passive mobility
- **A more robust clustering workflow** including more sophisticated clustering methods, and use of geoAI approaches
- Implementation and assessment of the developed methodology for **other European cities**.
- Produce a **modular palette / library of planning practices** connected to the urban form types and test it as an **integrated urbanism-mobility** planning support tool for **strategic connectivity-proximity planning**
- Produce a **modular spatial language** for facilitating the dialogue for the between built environment experts and non-expert stakeholders in the participatory planning context
- Address **urban form types in relation to socio-economical and or socio-cultural typologies.**

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