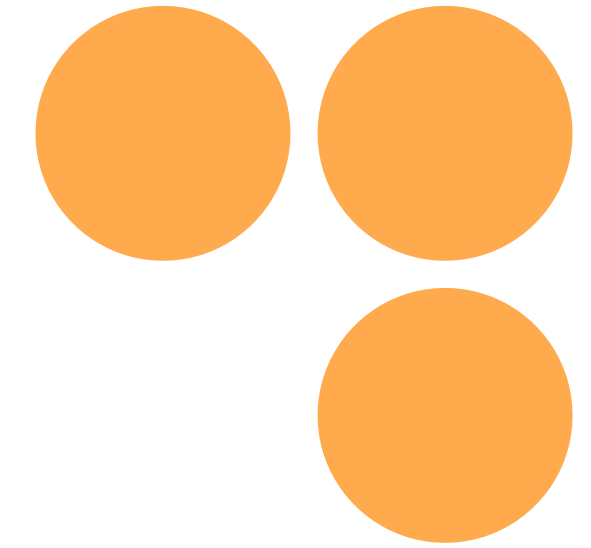


twinning towards
research excellence
in evidence-based planning
and urban design



Evidence-Based Design and Planning Research to inform design decisions and planning policy

Ilaria Geddes

Society and Urban Form (SURF) Research Lab,
Department of Architecture, University of Cyprus, Cyprus

@Society and Urban Form Research Lab
Presentation to King's College London Geography Department
09th December 2025



This project has received funding from the European Union's Horizon Europe Research and Innovation Programme under Grant Agreement No. 101078890



UK Research
and Innovation

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TWIN2EXPAND

Evidence-Based Design and Planning

Research to inform design decisions and planning policy

@ the Society and Urban Form Research Lab

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09 December 2025

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University
of Cyprus



Support the development, design and planning of cities which enable and foster social progress, sustainable practices and healthy habitats.

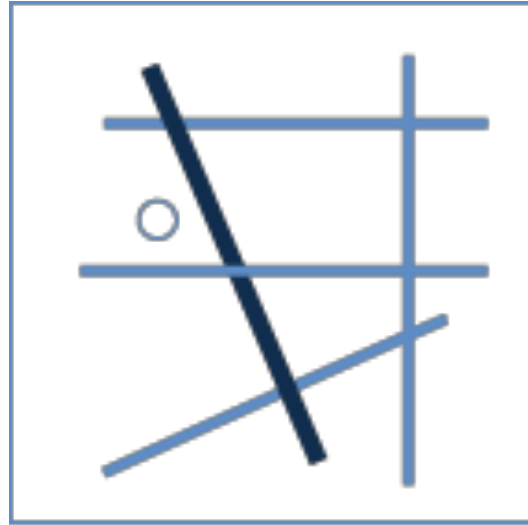


Develop knowledge and solutions to create the conditions which enable a high quality of life in cities.



Foster research capacity and excellence in urban design, planning and governance in the Eastern Mediterranean and Middle Eastern (EMME) region.





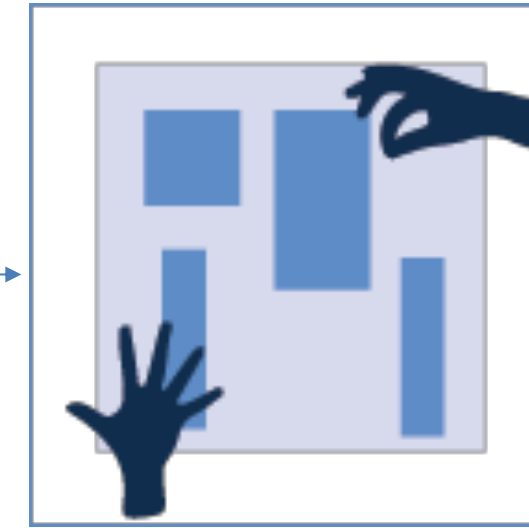
Socio-spatial analysis



Urban morphology



Evidence-based design and planning



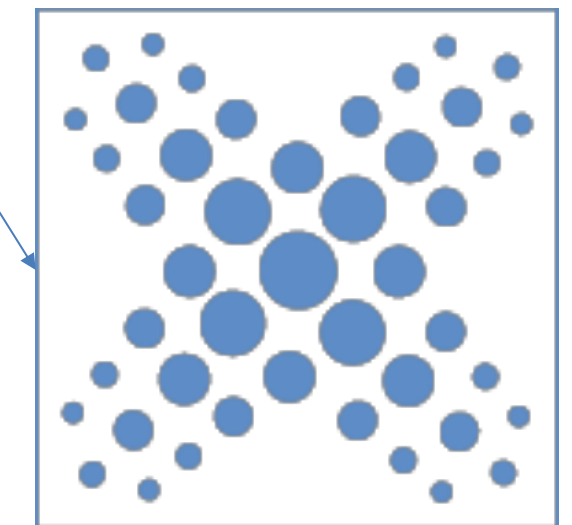
Participatory design practices



Mediterranean cities



Healthy cities



Sustainable urban governance

grounded in
science

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Cities are big, complicated and slow to build.

Governments change over years

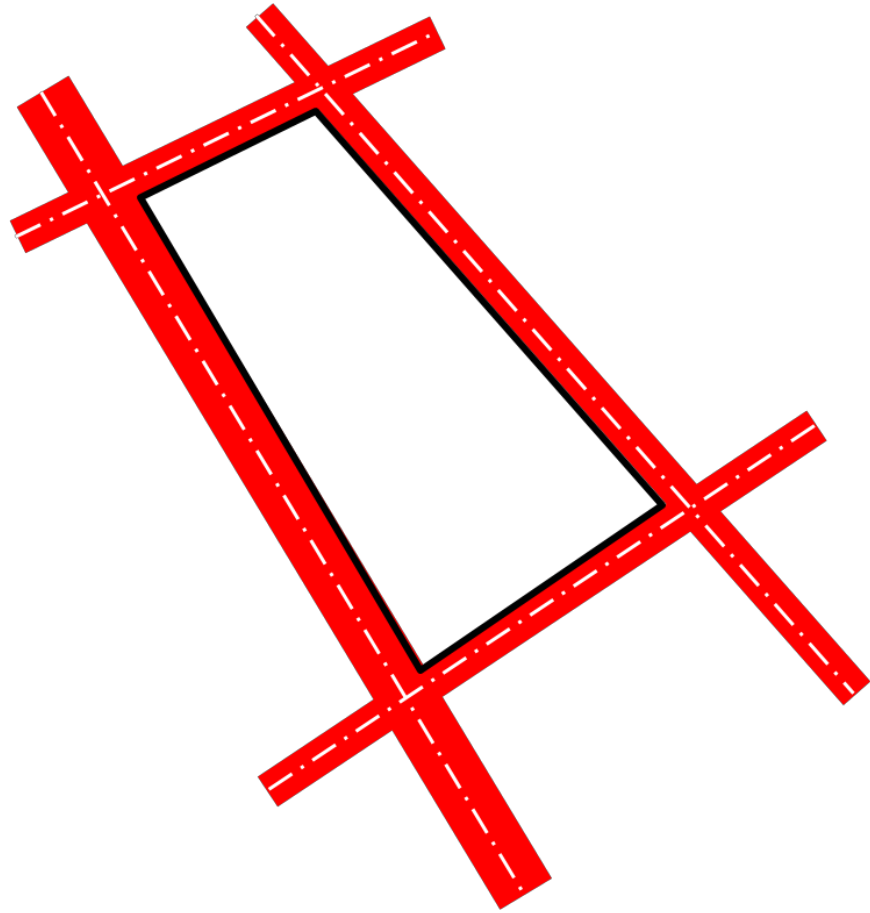
Economies change over months

Streets change over centuries

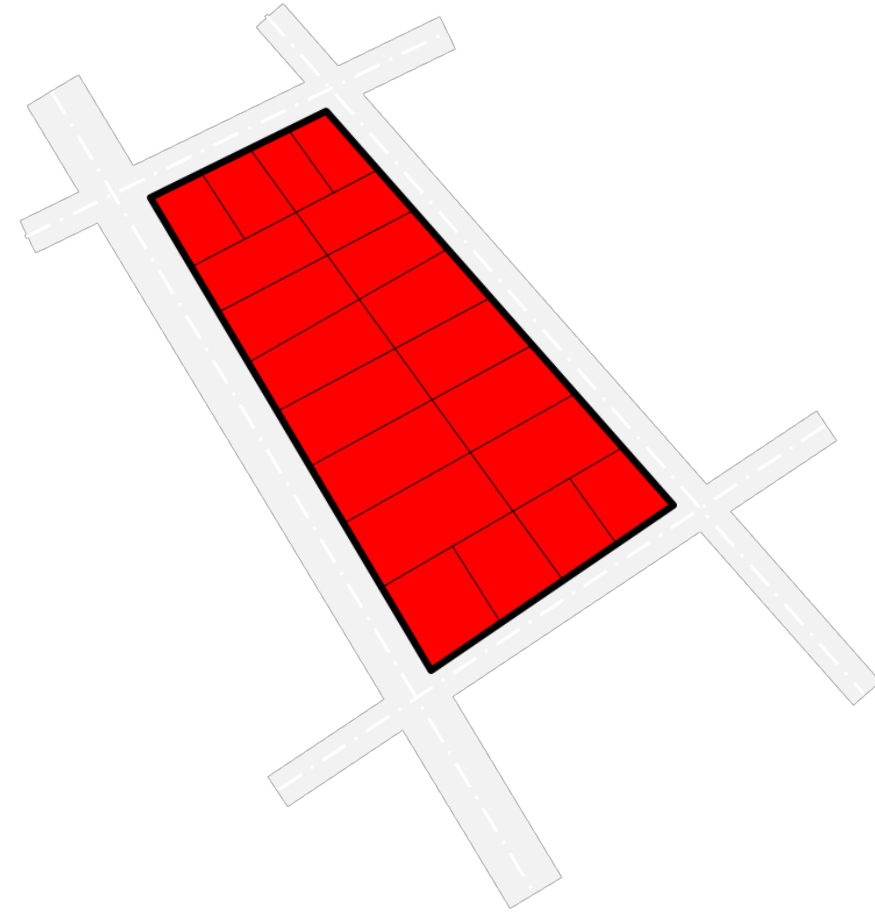
Buildings change over decades

Activities change over minutes

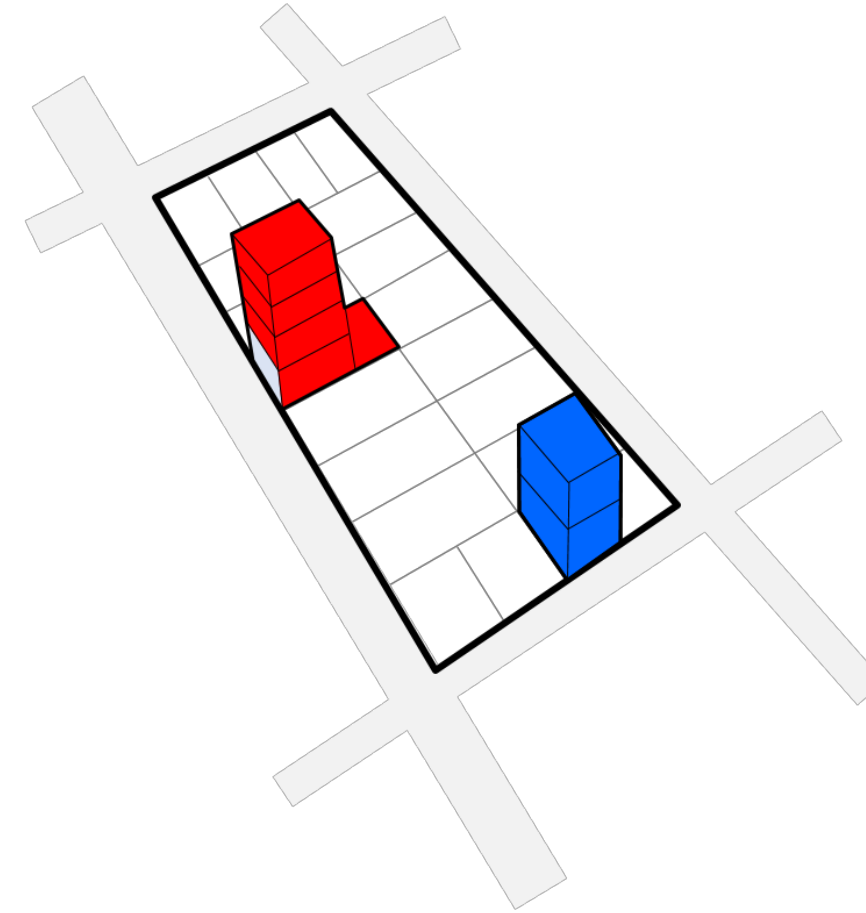
We should therefore design the fewest, most influential elements:



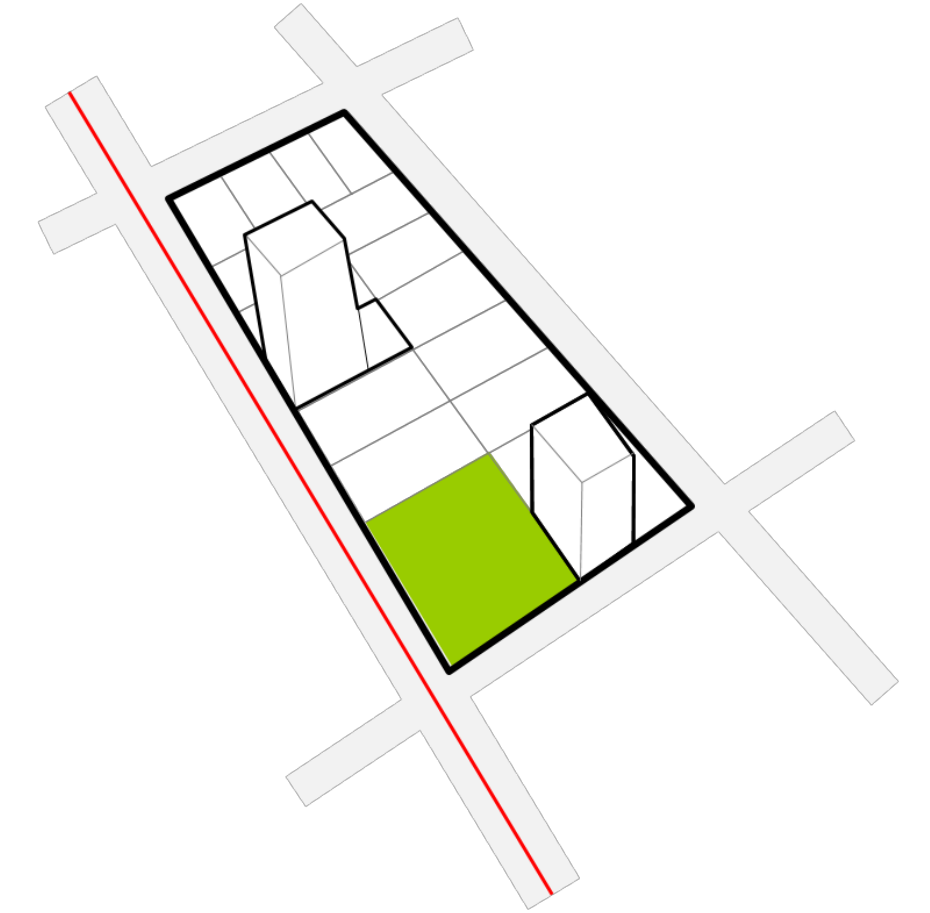
Spatial network
Hierarchies
Street typologies
Infrastructure



Plots
Ownerships
Security
Finance



Plot Typologies
Activities
Densities
Interfaces



Services
Public Transport
Schools
GPs
Parks

Space syntax

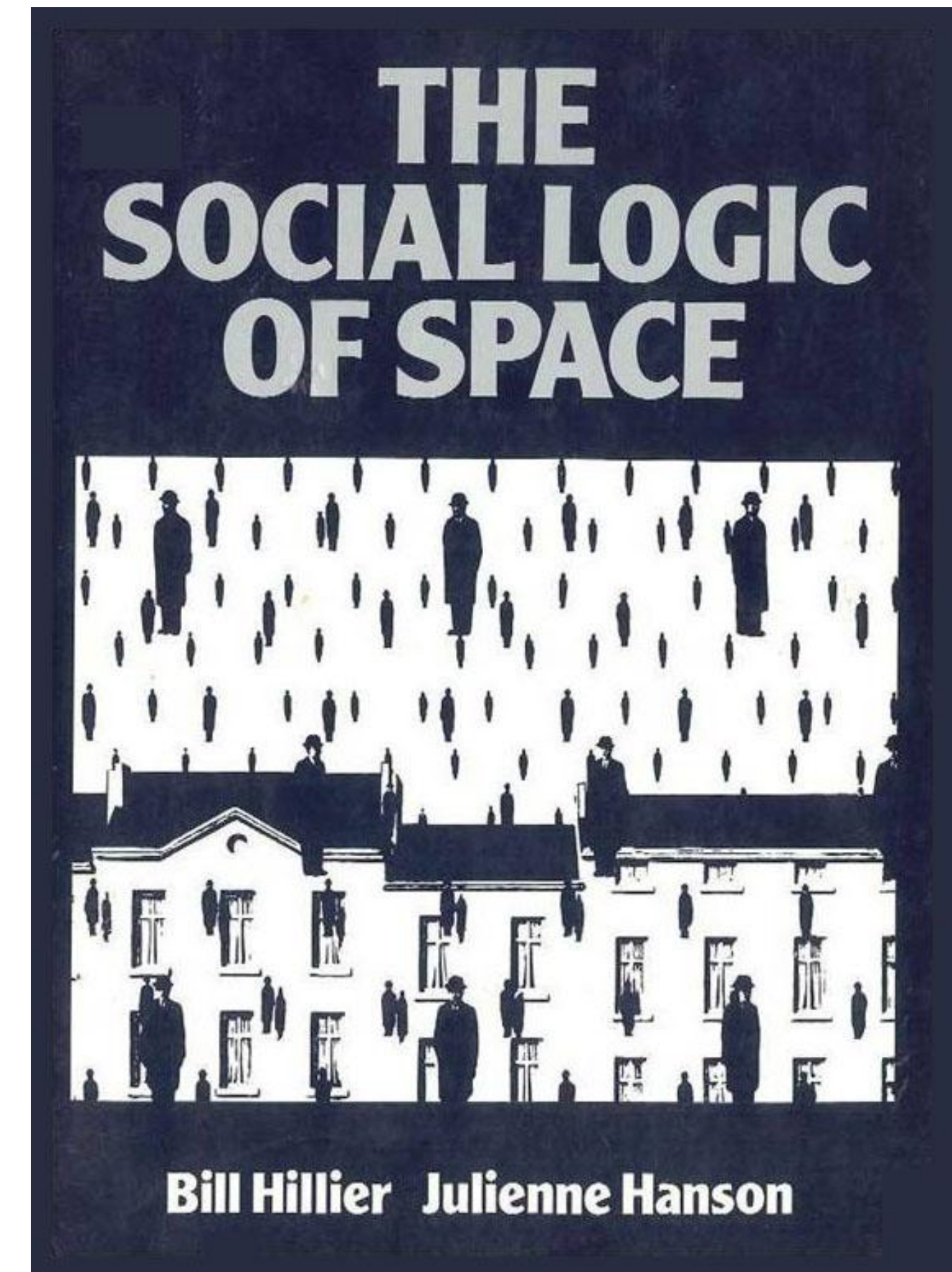
Space is not a background to human activity but is **intrinsic** to it.

Space syntax is a theory and a method for quantitatively describing patterns of spatial layout and relating these patterns to social activities such as movement, behaviour, and even social meaning and interpretation

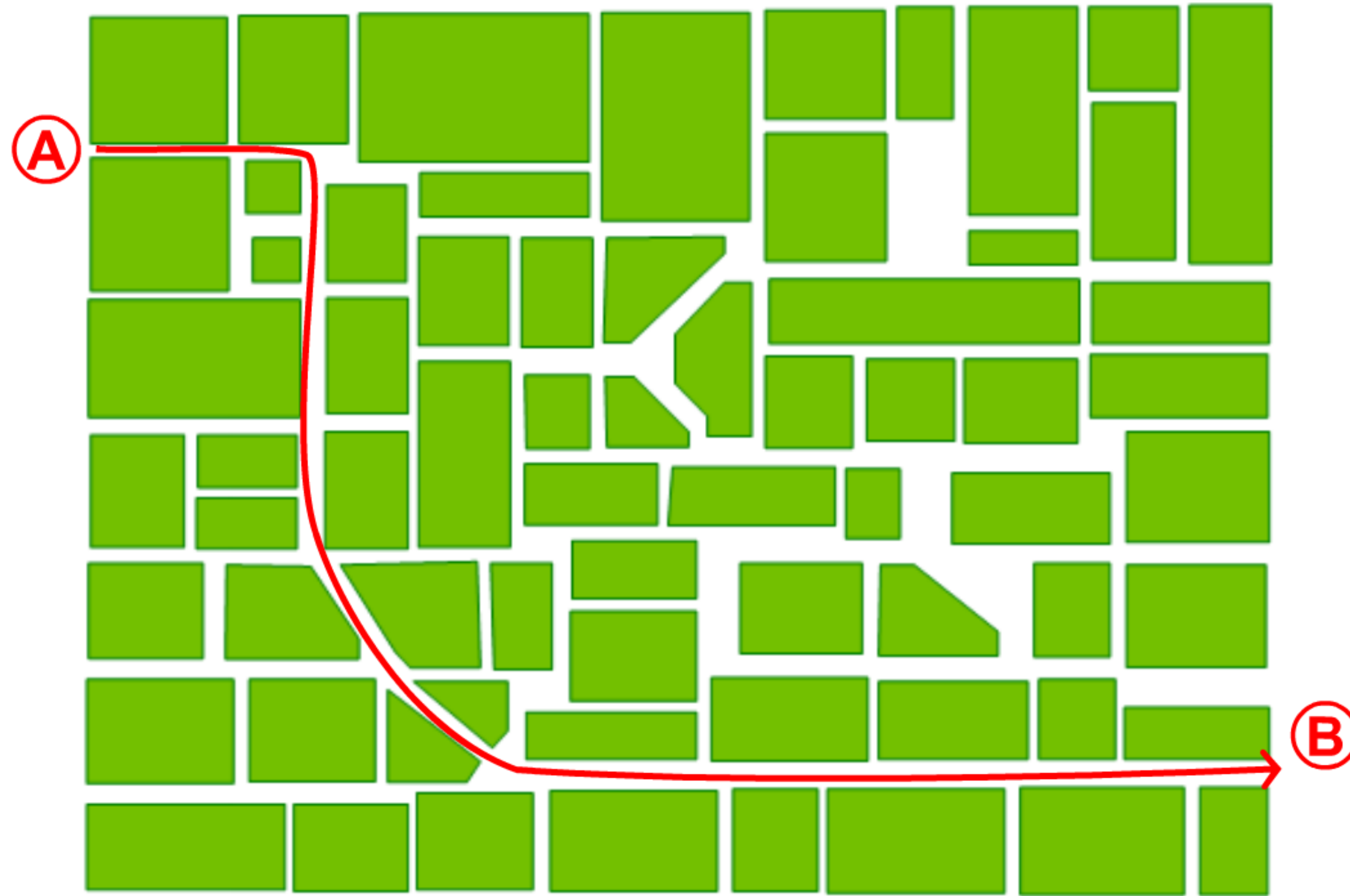
- to understand and simulate the social effects of design.

Space is first and foremost **configurational**

- what happens in any individual space is fundamentally influenced by the relationships between that space and the network of spaces to which it is connected.

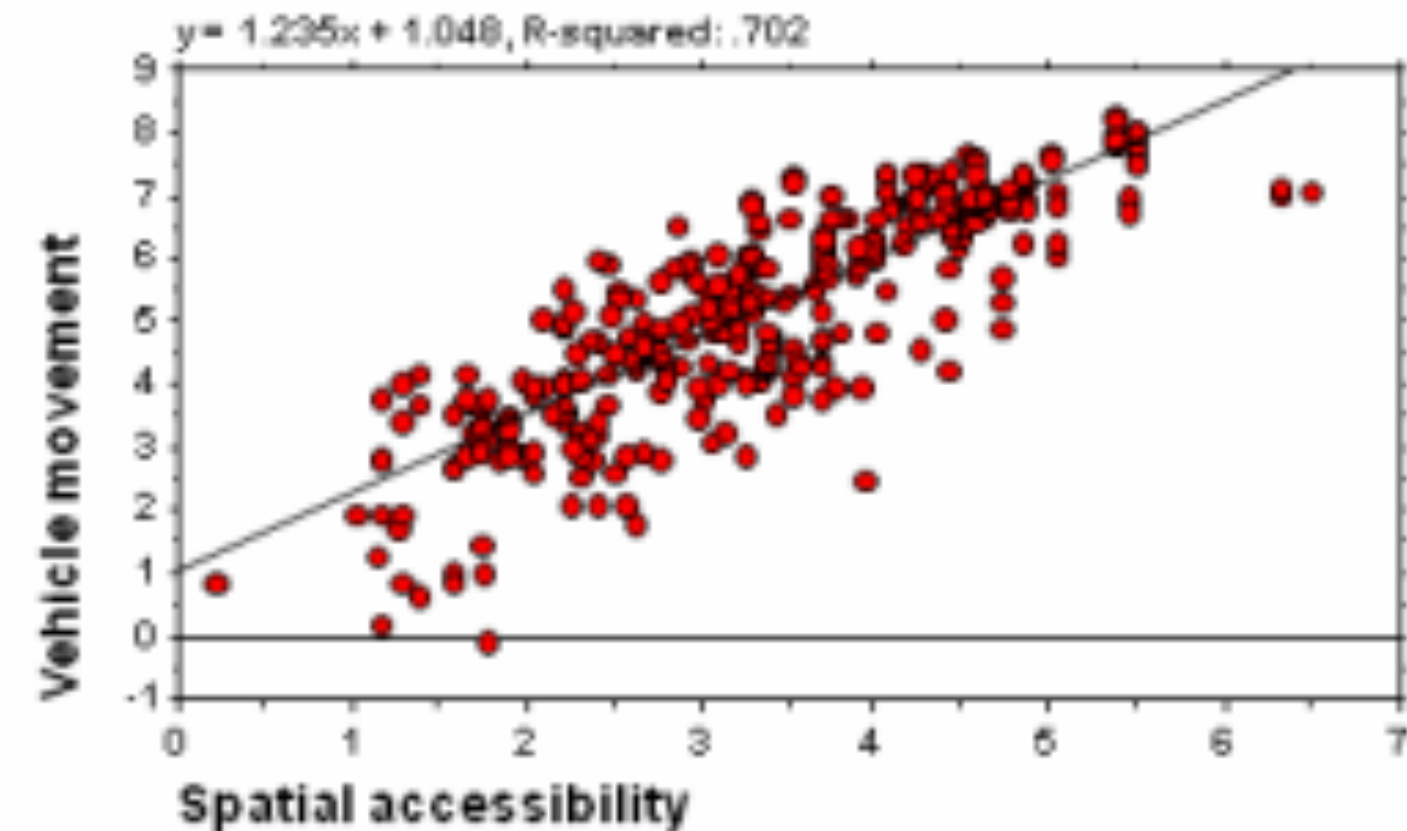
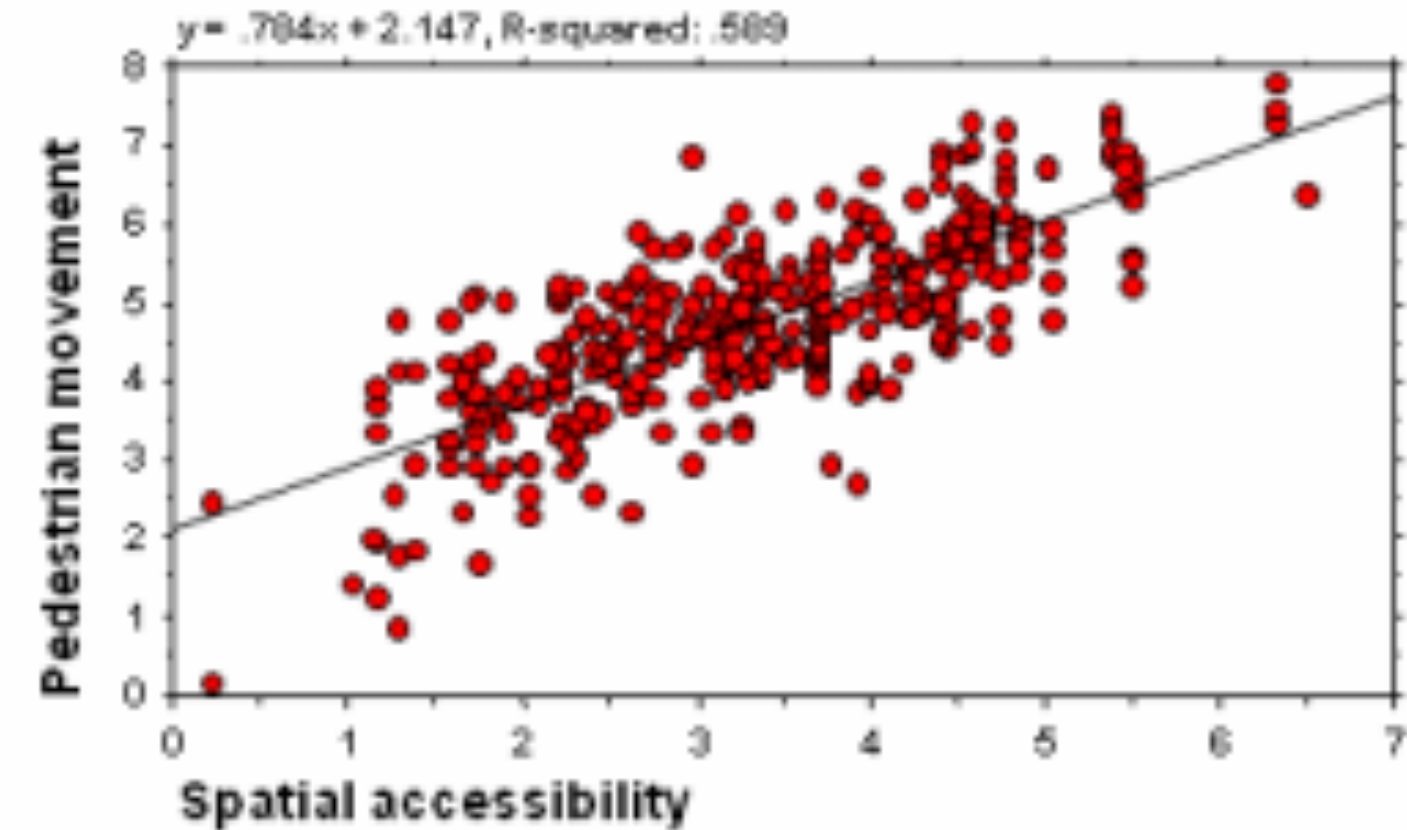


Simplest path / least angle change



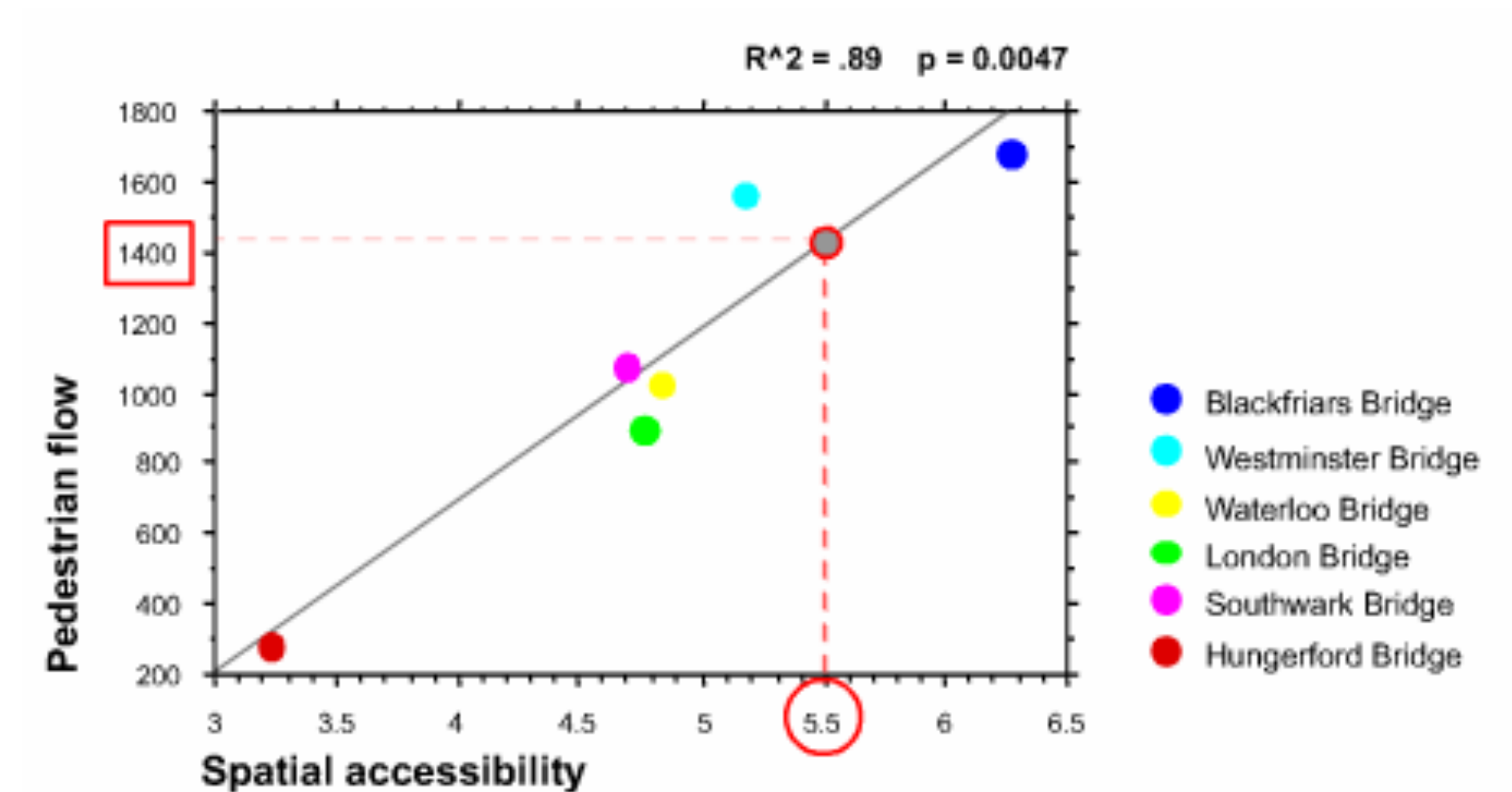
Spatial layout organizes movement

- 60–80% of movement flows are due to the structure of the network – more accessible places get more movement
- The volumes of movement are mostly determined by density – the distribution of movement is mostly determined by the relative accessibility of the network
- To predict movement there must be a correlation between flows and accessibility values in the given context

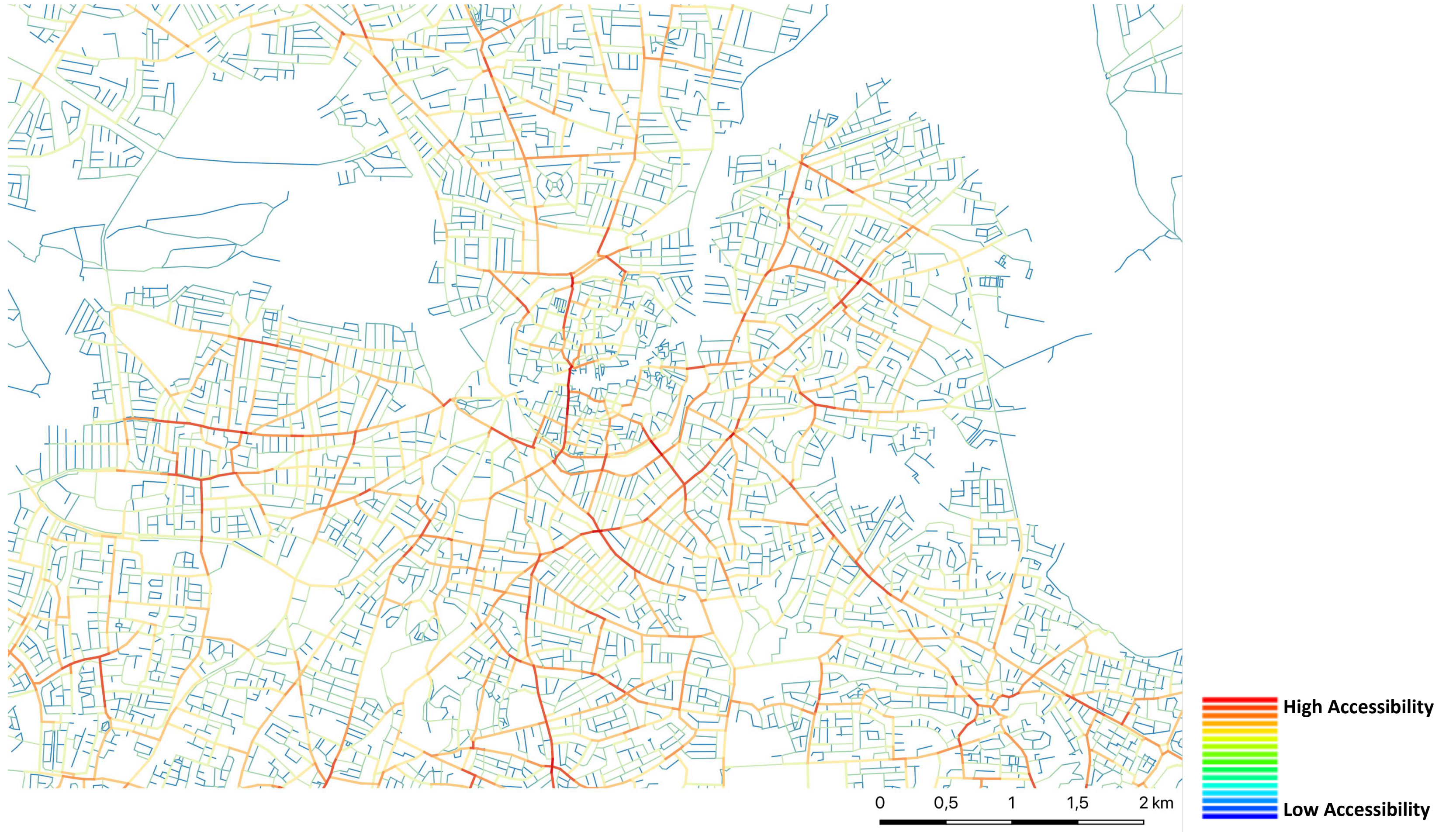


Workflow for predictive modelling

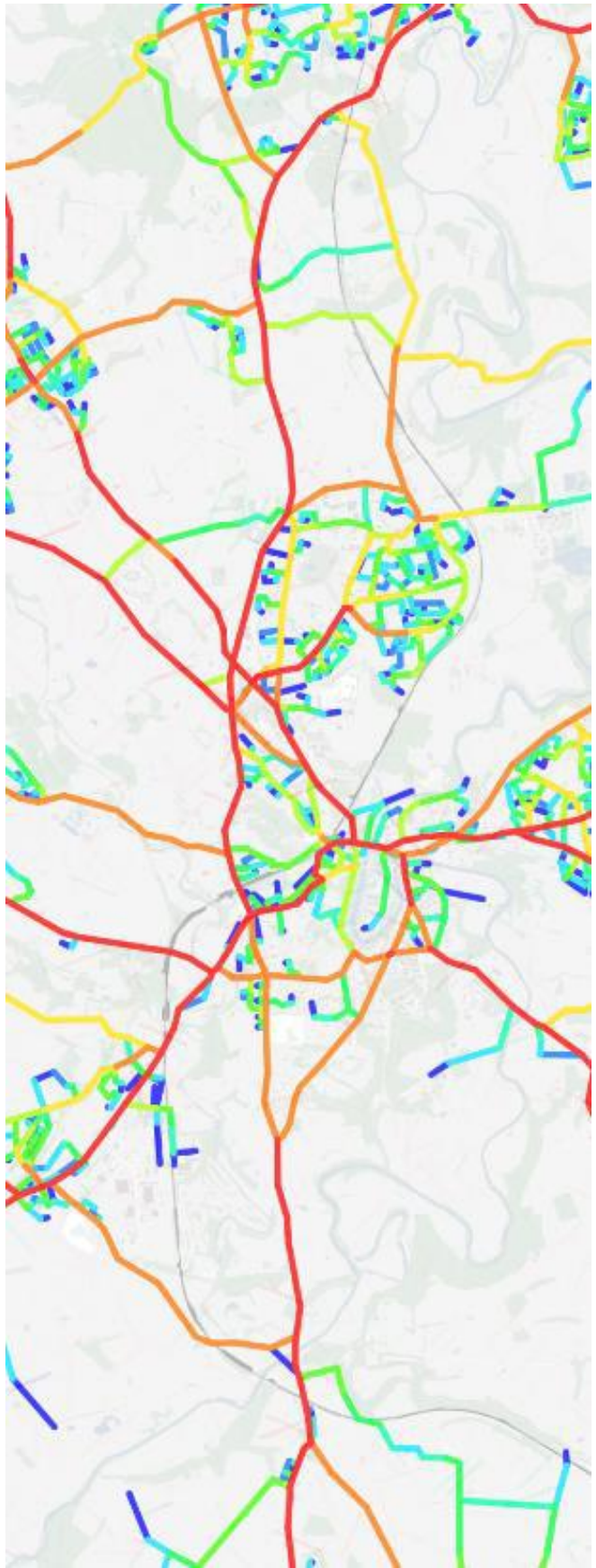
- Data collection on pedestrian movement across Larnaca
- Find the best correlation
- Evaluate volumes in relation to density
- Estimate density within the masterplan
- Project pedestrian movement values onto masterplan street network
- Different scenarios can be evaluated [indicating economic potential of different layouts]



Betweenness centrality



Key relationships



Urban form



Movement



Land use



Economy



Crime



Sustainability

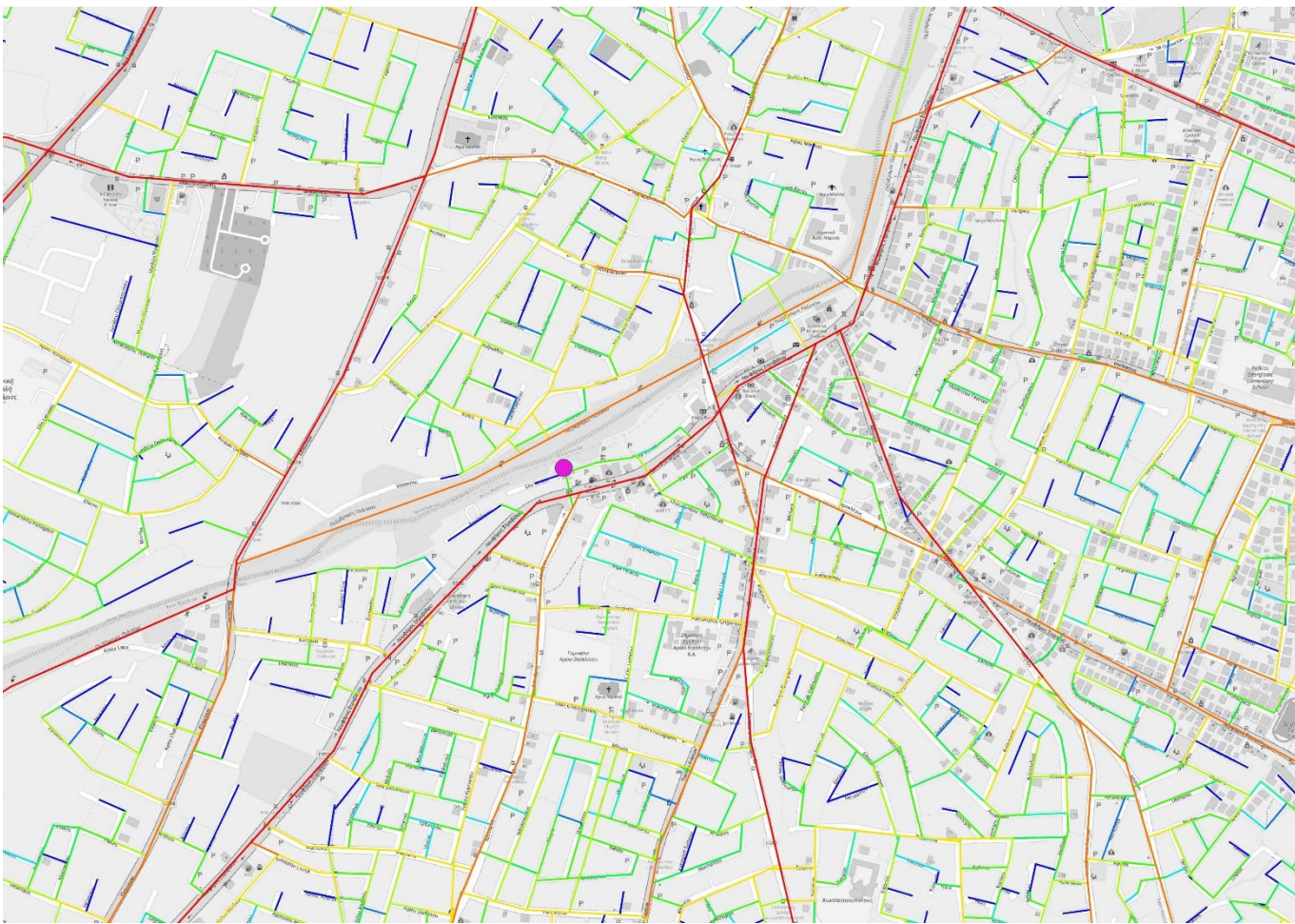
applications in cyprus

a predictive tool of design impacts

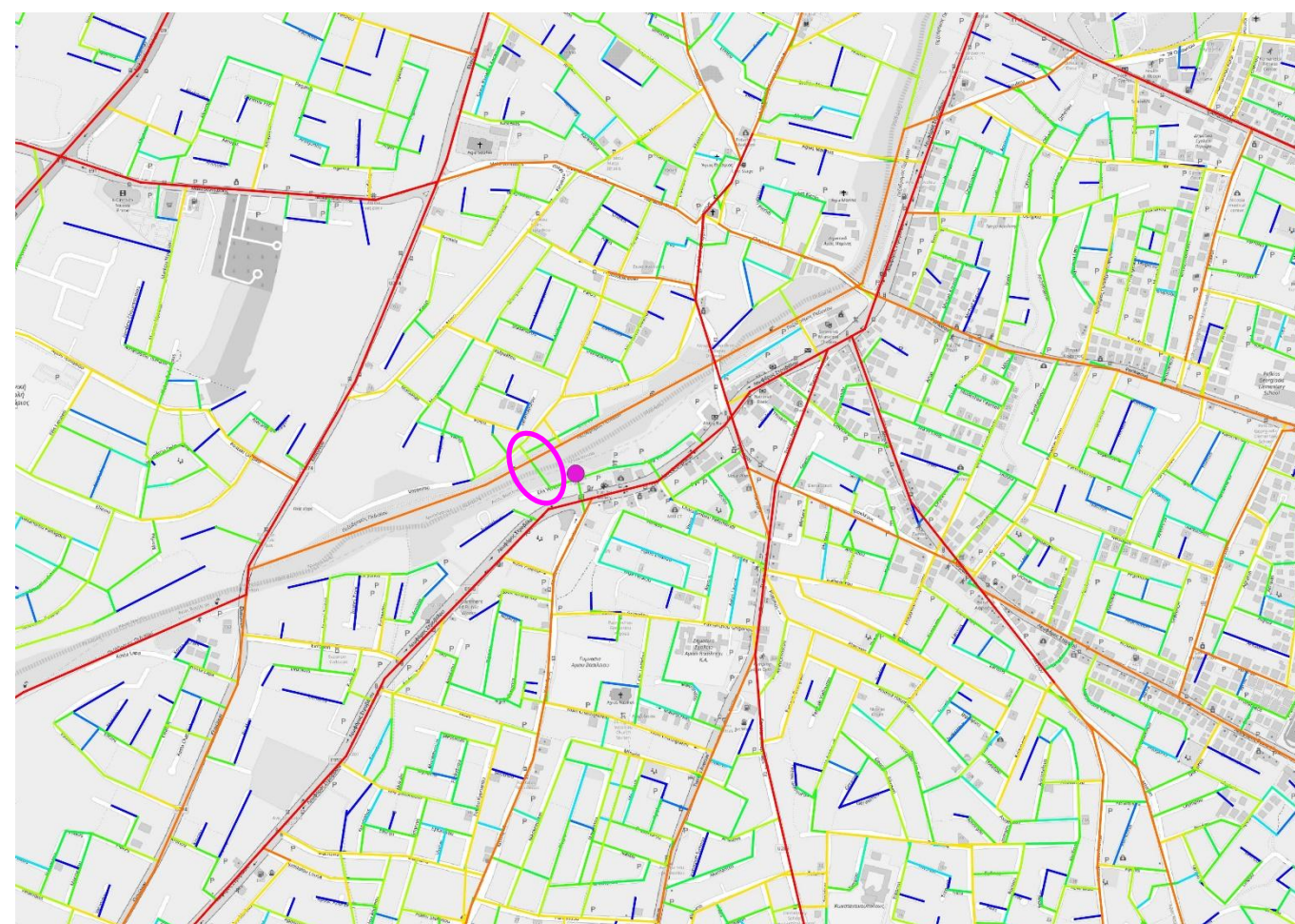
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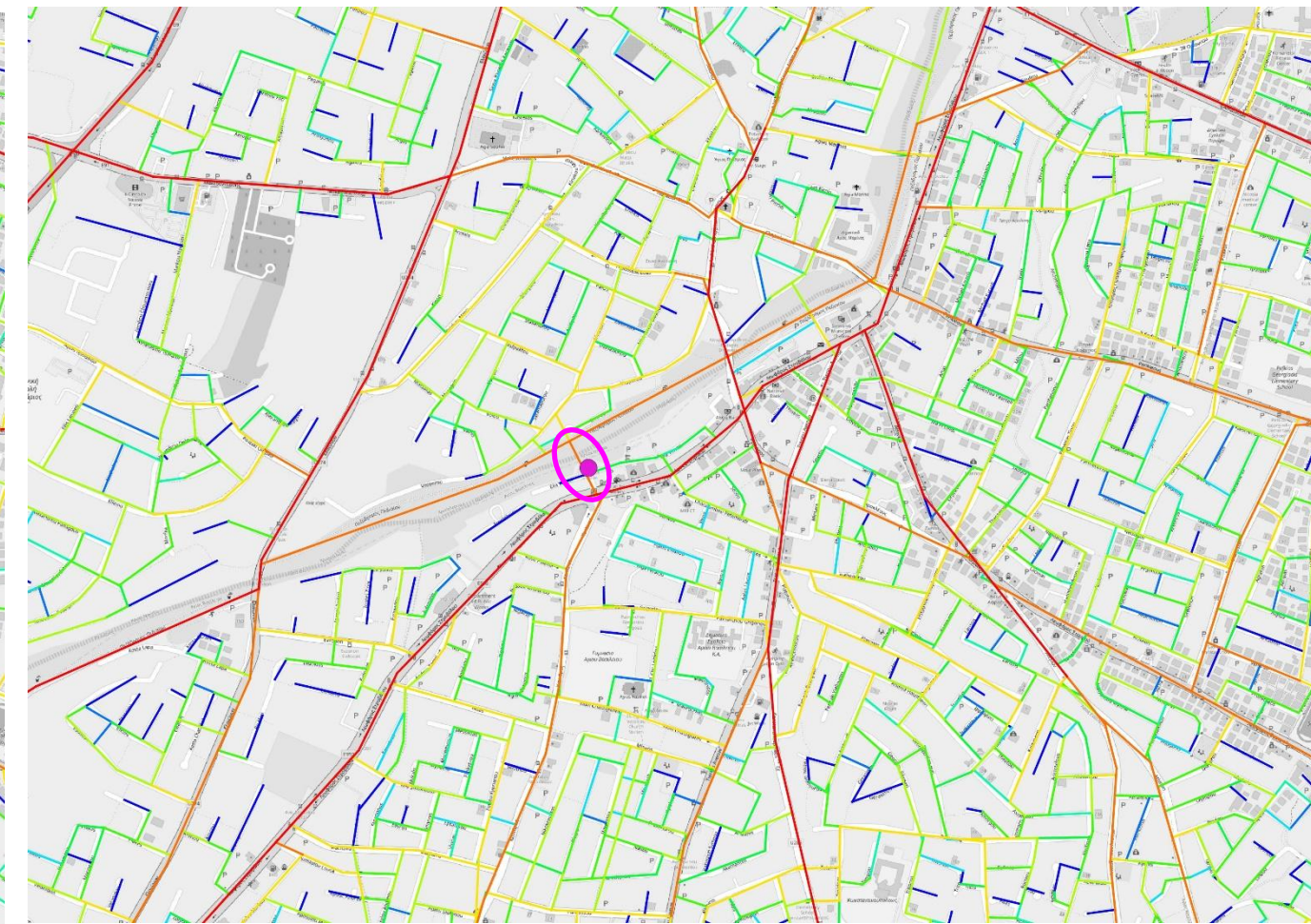
Connecting places to other places across the whole city



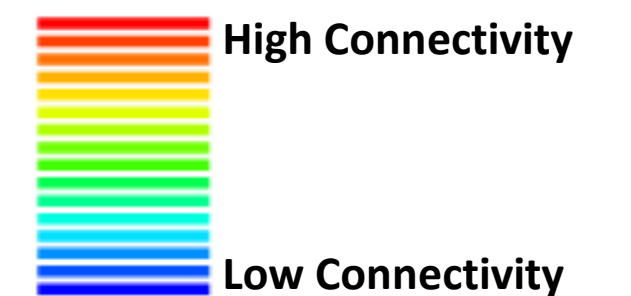
Existing



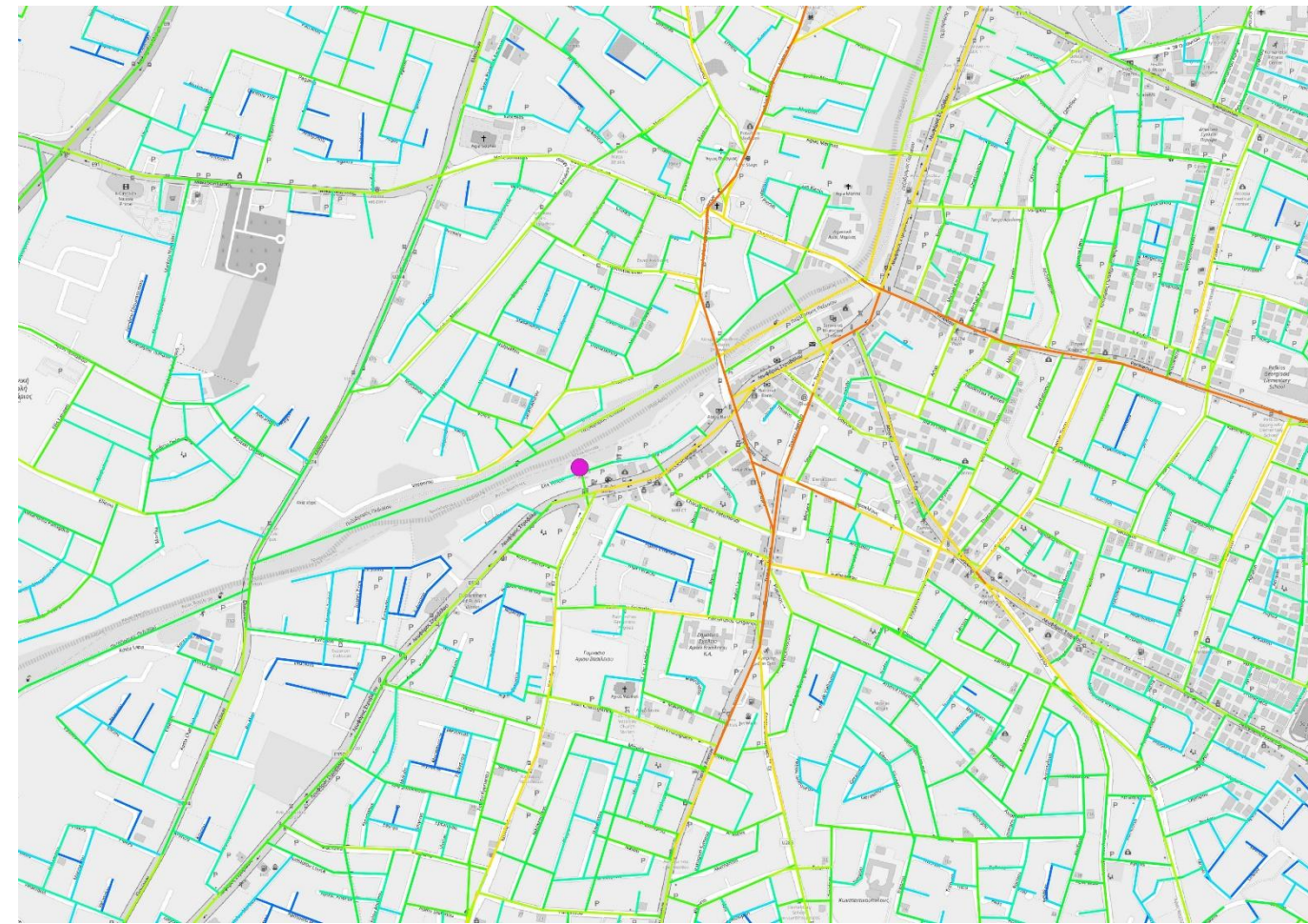
Masterplan Bridge connectivity value: 0,878



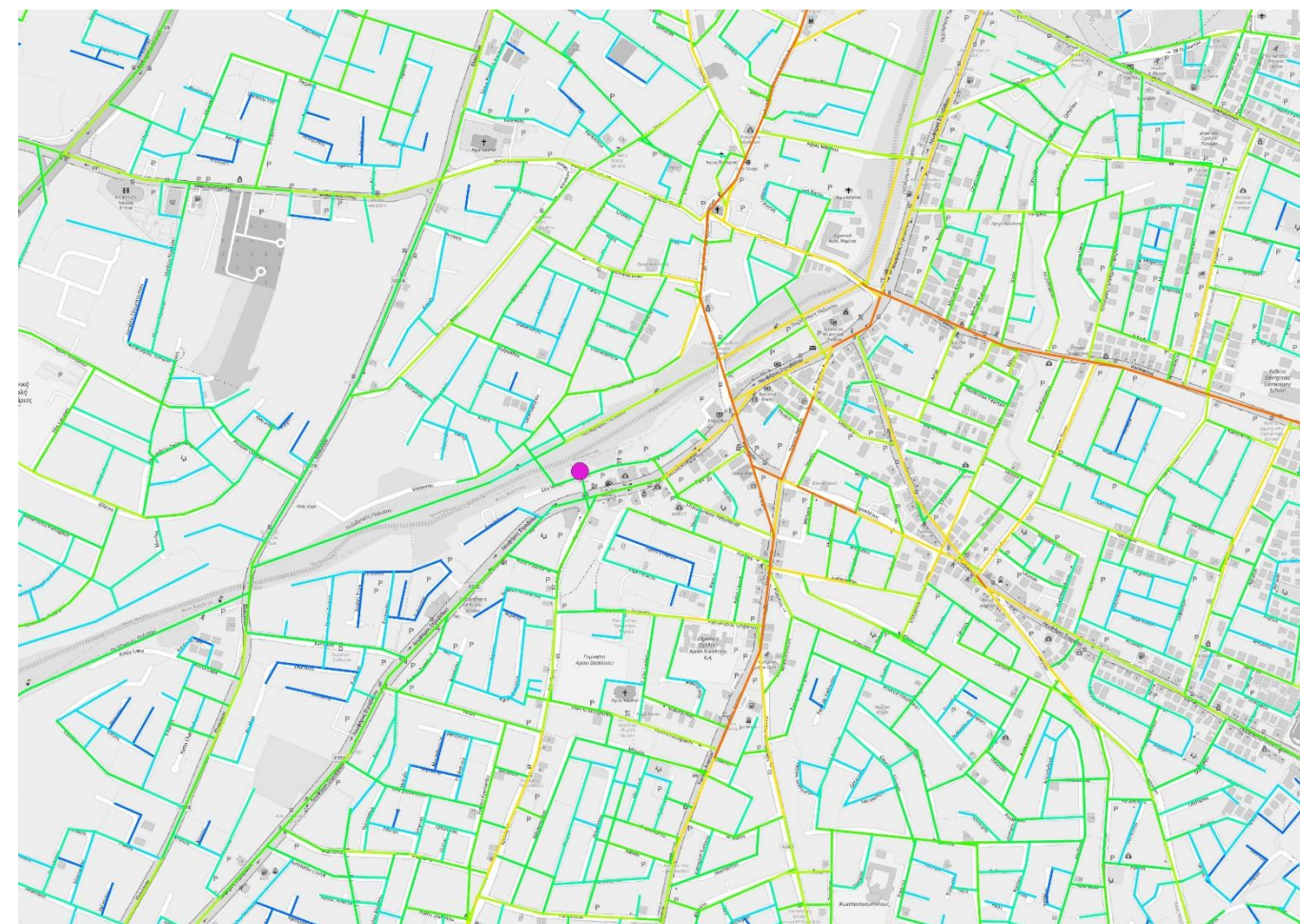
Alternative Bridge connectivity value: 1,458



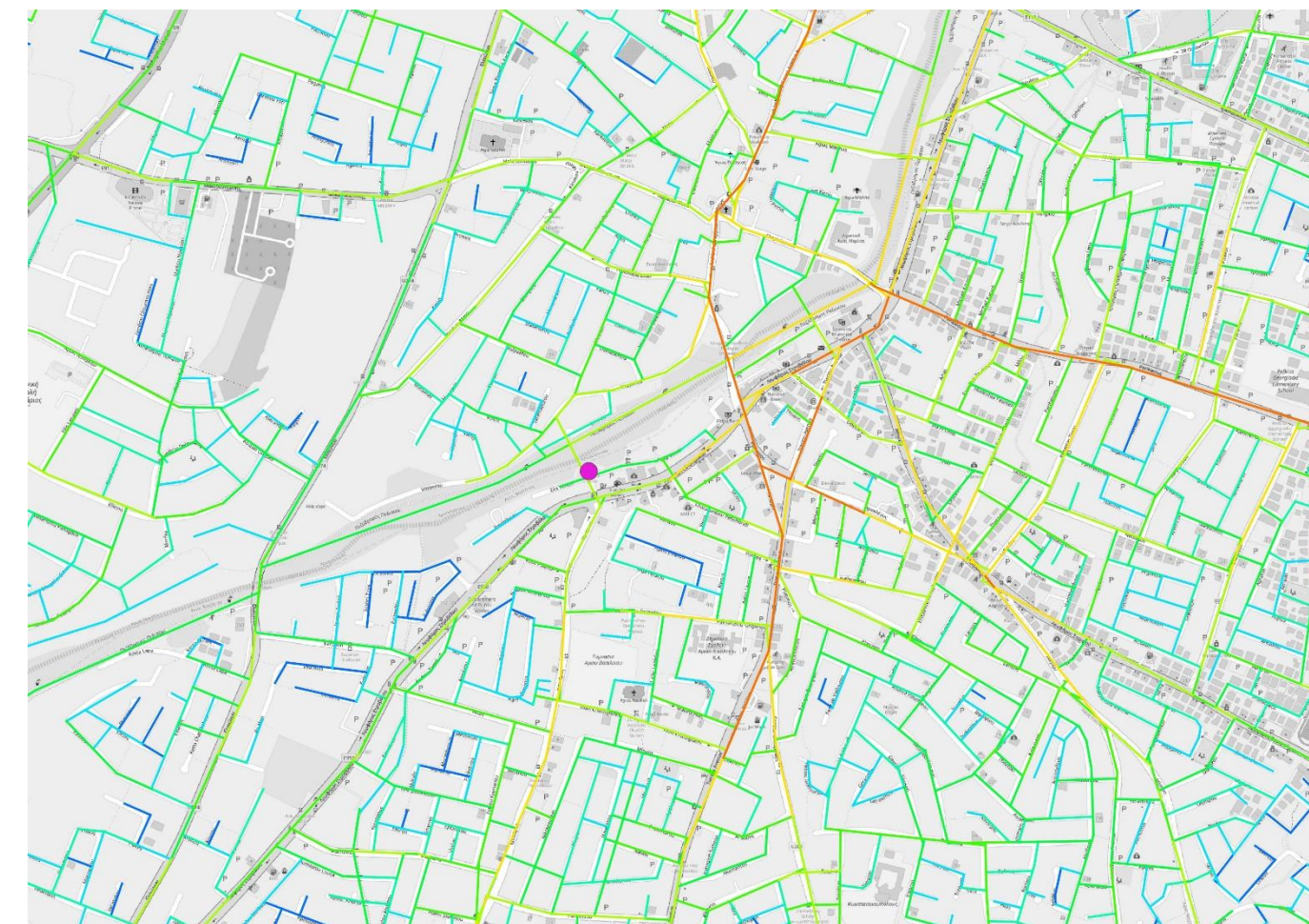
Easy to reach from places within 800m



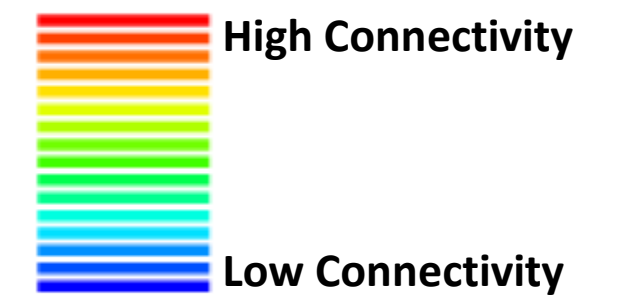
Existing



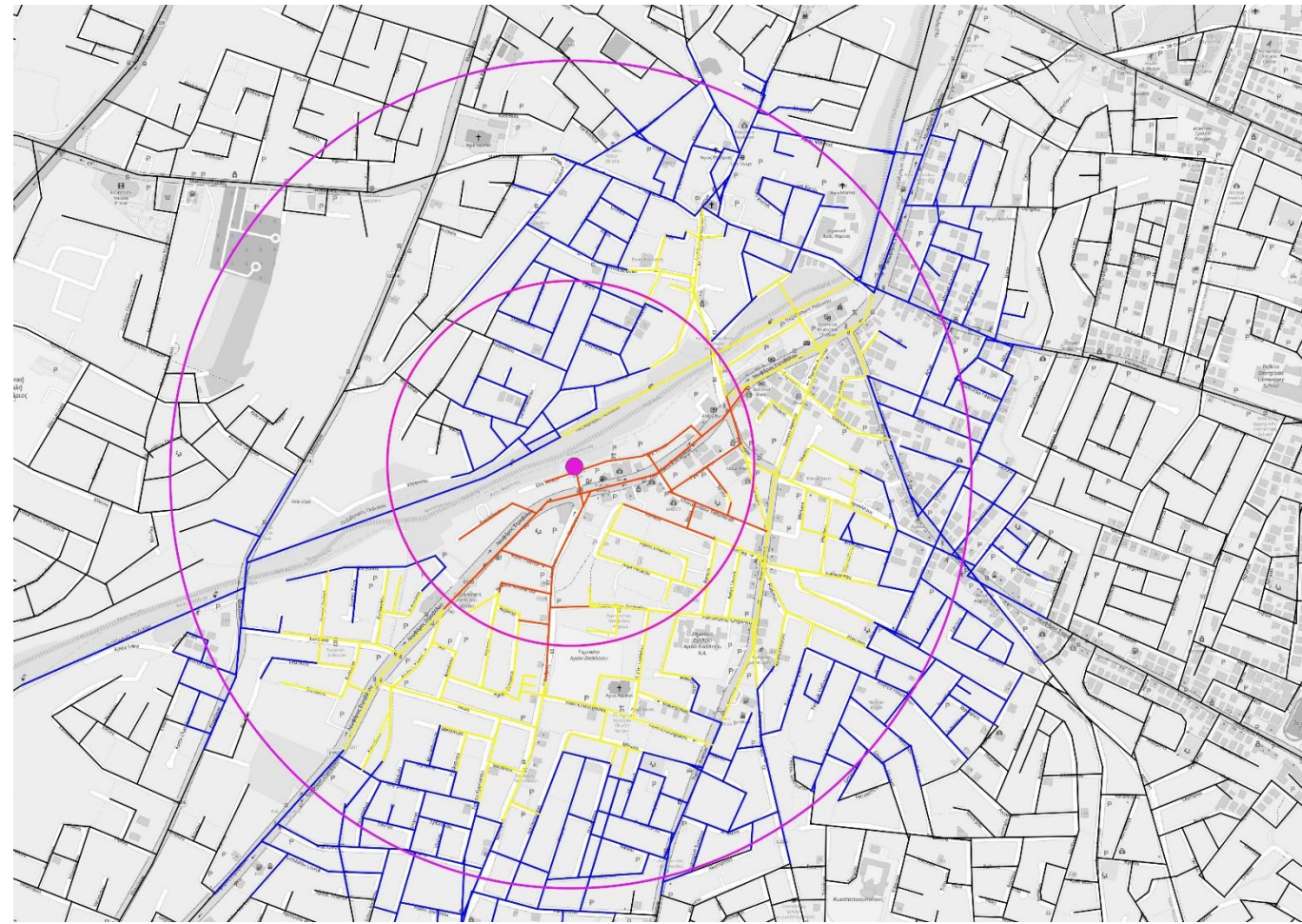
Masterplan Station accessibility value: 0,991



Alternative Station accessibility value: 0,980



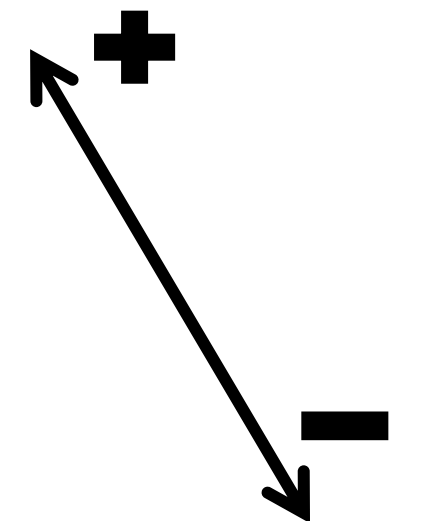
400-1200m network distance from bus station



Existing

Masterplan

Alternative



-  Within 400m
-  Within 800m
-  Within 1200m

applications in cyprus

evaluating service provision

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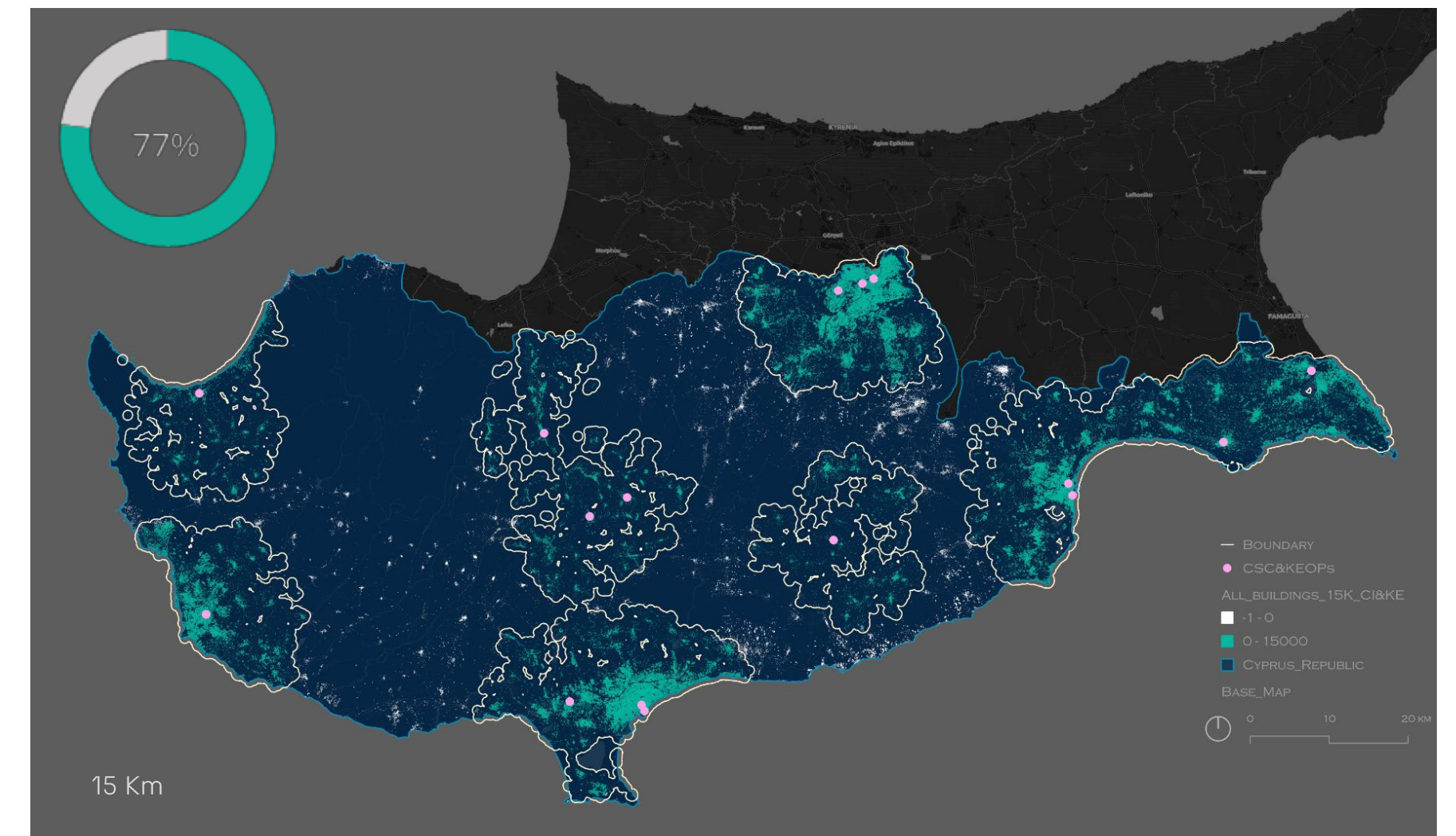
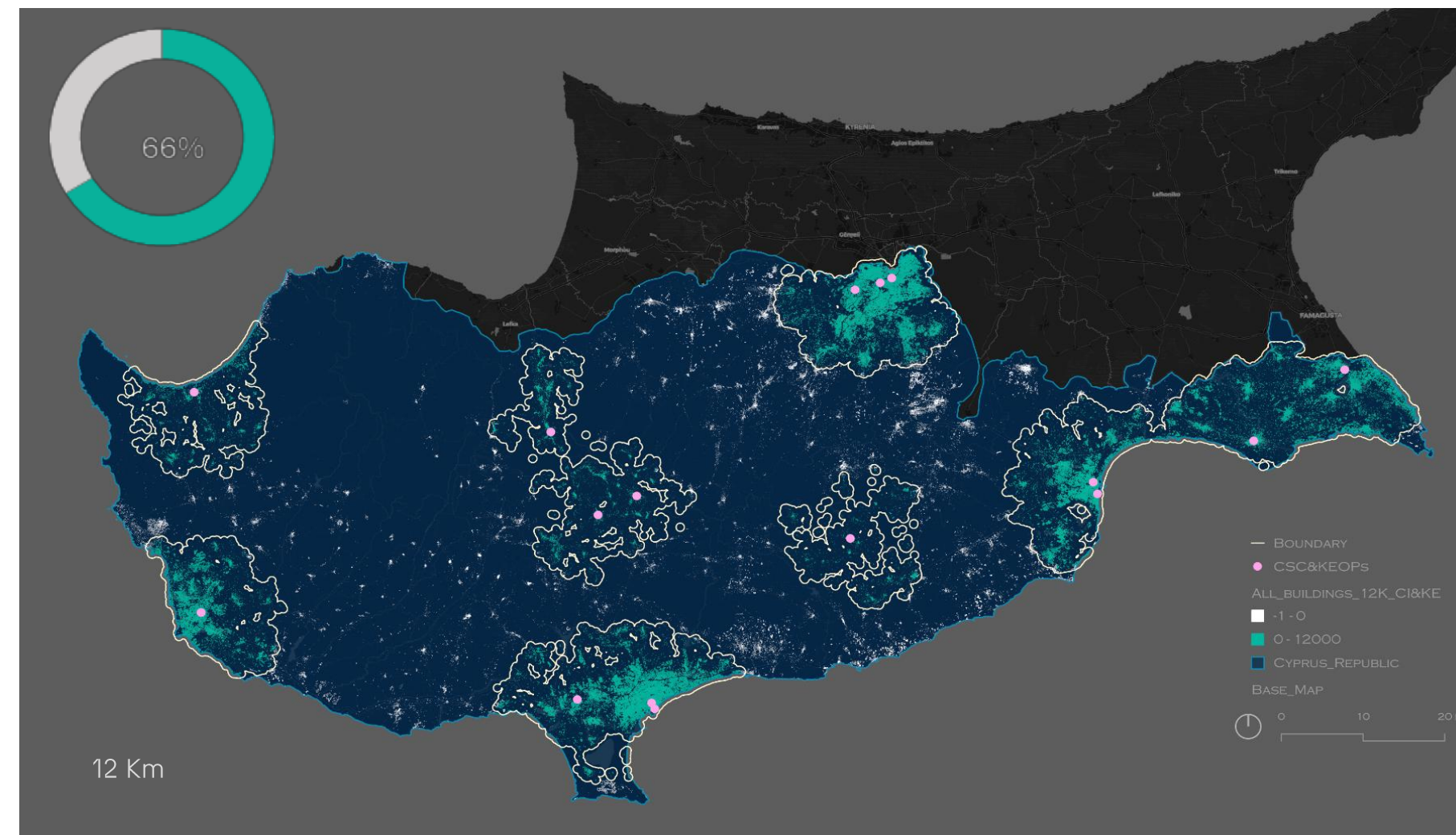
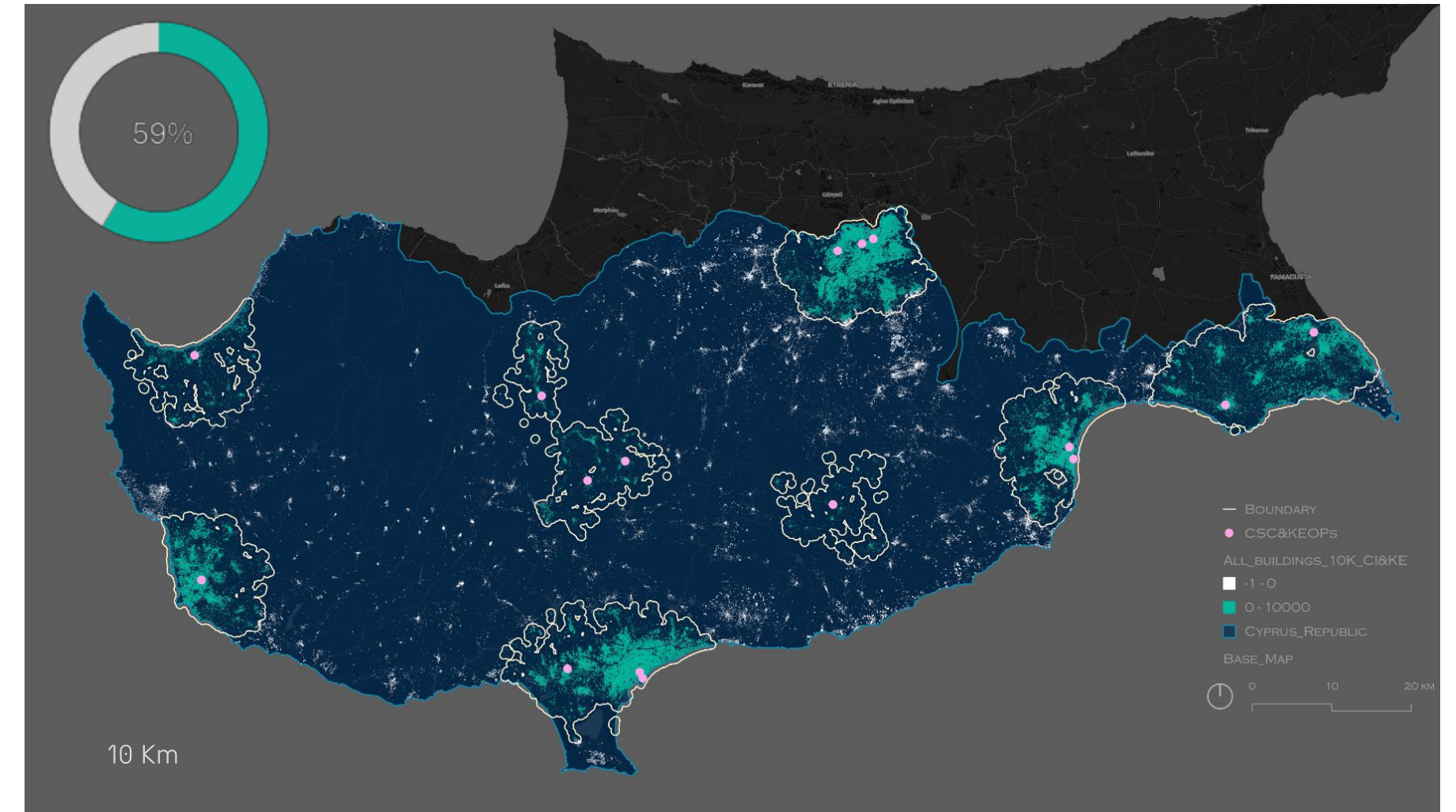
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National scale: KEPs and KEPOs

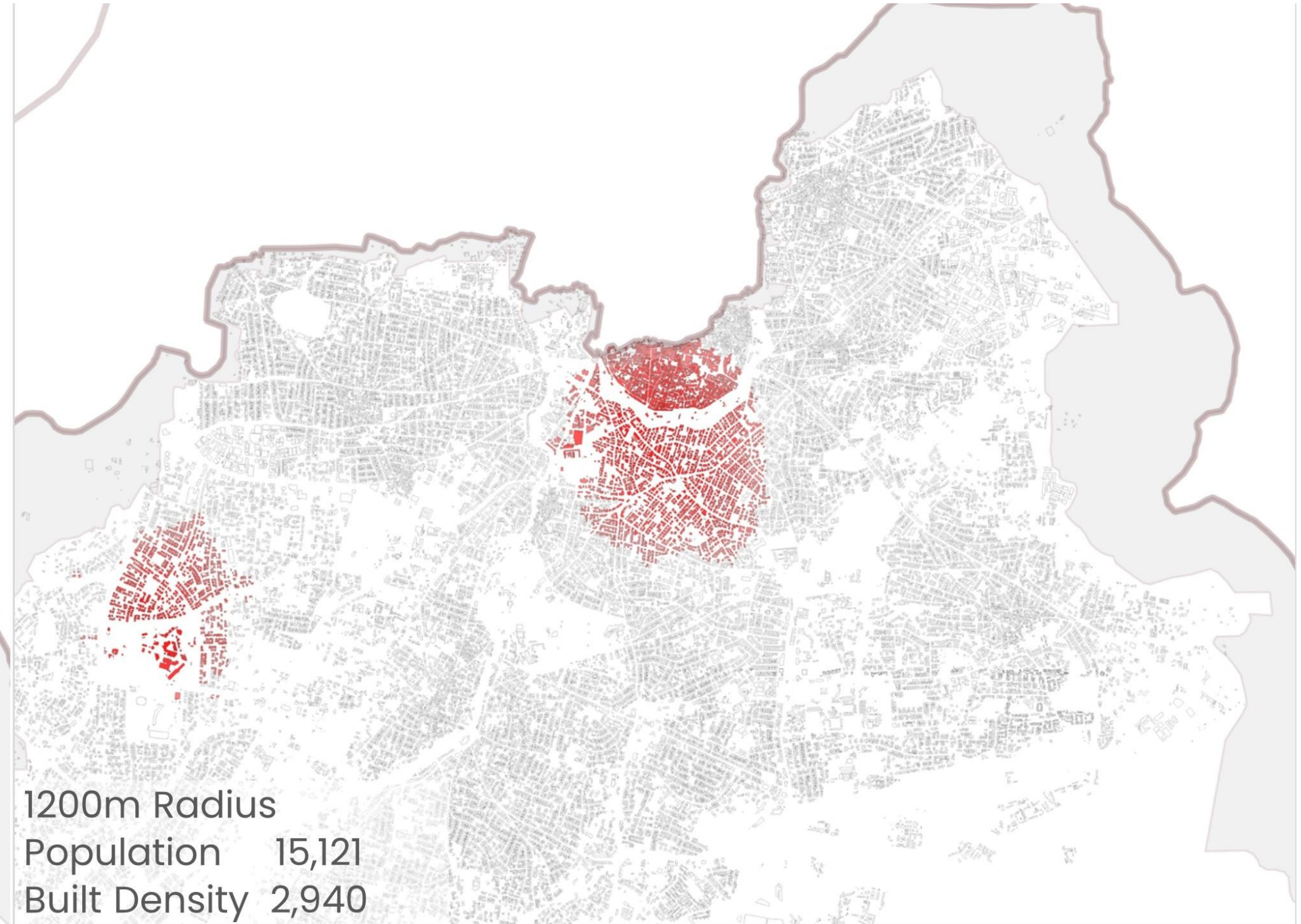
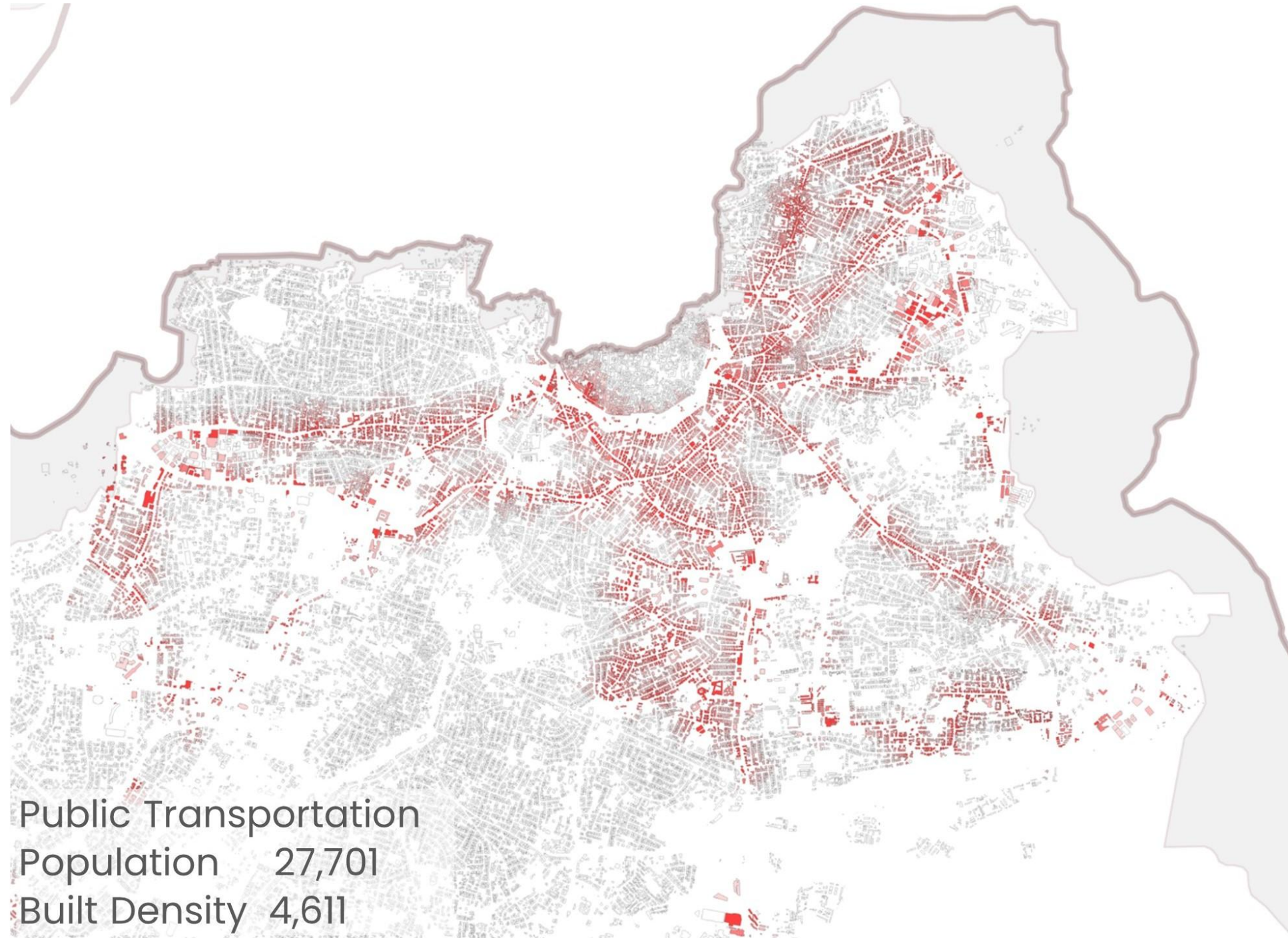
The national scale analysis reveals that the KEPs and KEPOs together serve:

- **59%** of the population at a 10Km distance
- **66%** of the population at a 12Km distance
- **77%** of the population at a 15Km distance

Underserved areas are identifiable in the maps even at a 15Km radius.



Urban scale: KEPs



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TWIN2EXPAND is a project funded by Horizon Europe. It aims to enhance research capacities in evidence-based urban design and planning (EBDP) as a field of critical importance in the R&I of integrated approaches and technologies for effective spatial planning and sustainable urban governance.



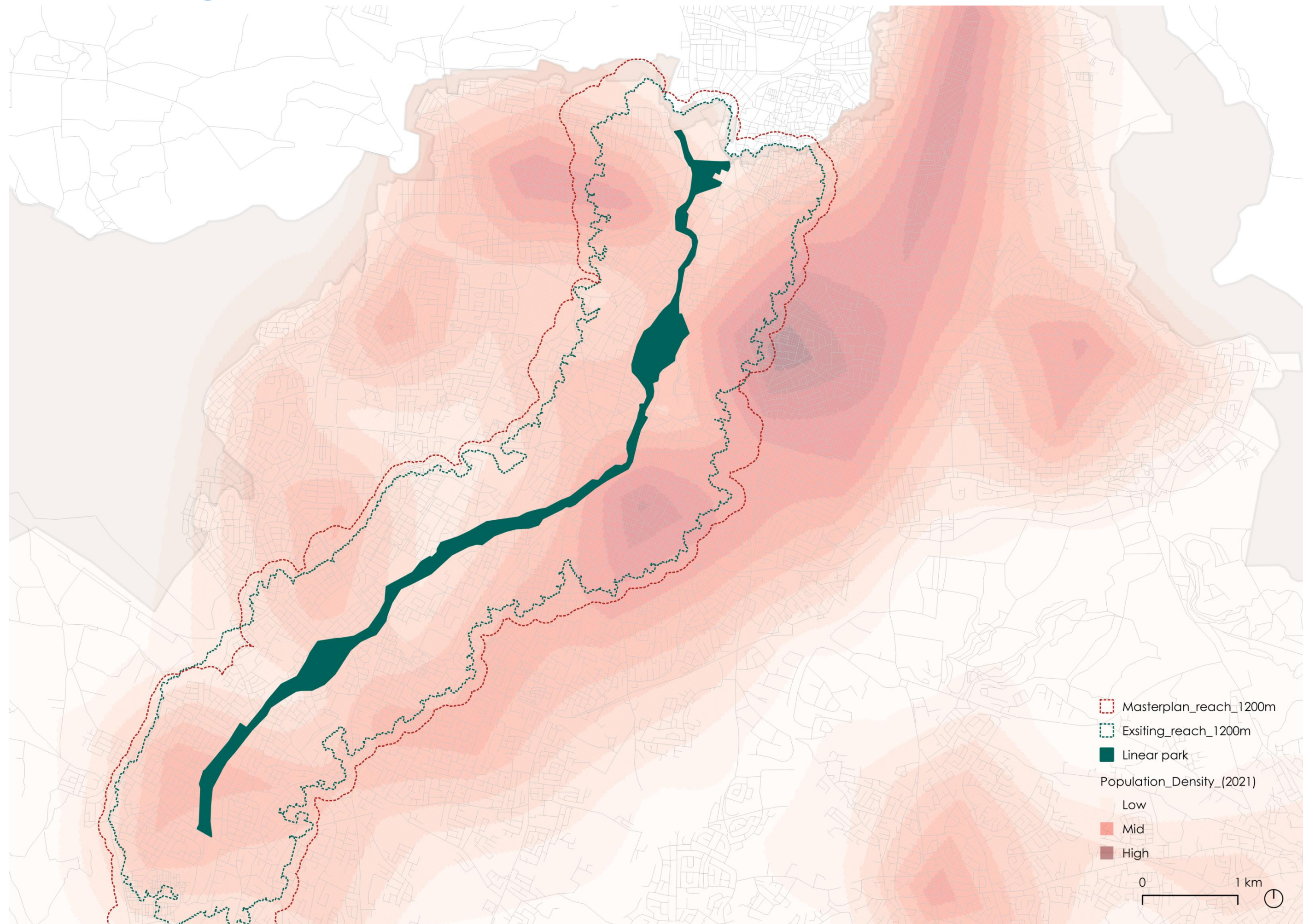
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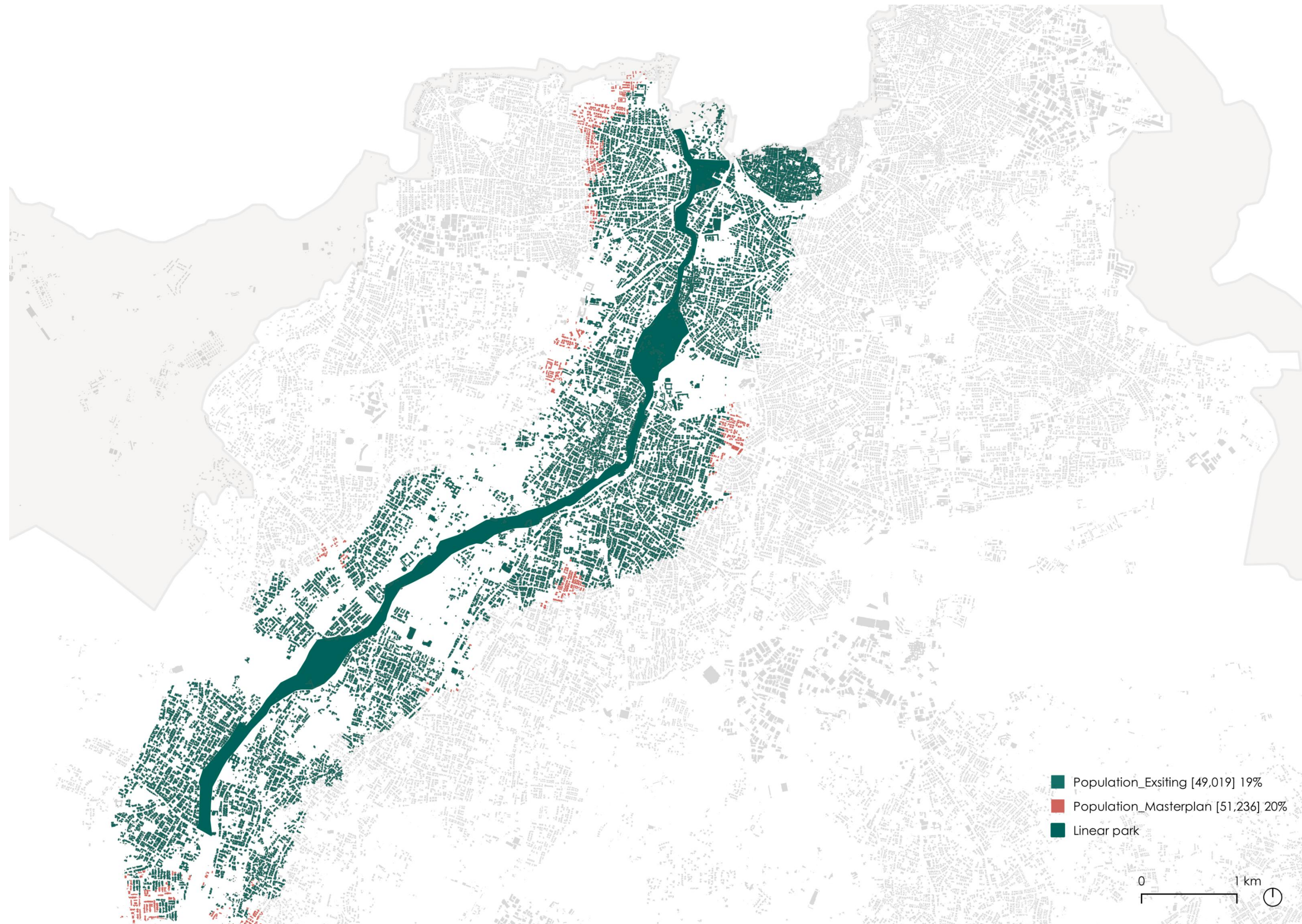
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What are the challenges and barriers of applying existing spatial models, KPIs and tools focusing on social-economic performance in *data challenging urban environments*?

Pedieos: existing and masterplan. Density reach.



Pedieos: existing and masterplan. Population Reach.





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