

(Urban) form/function in Great Britain

<https://urbangrammarai.xyz>

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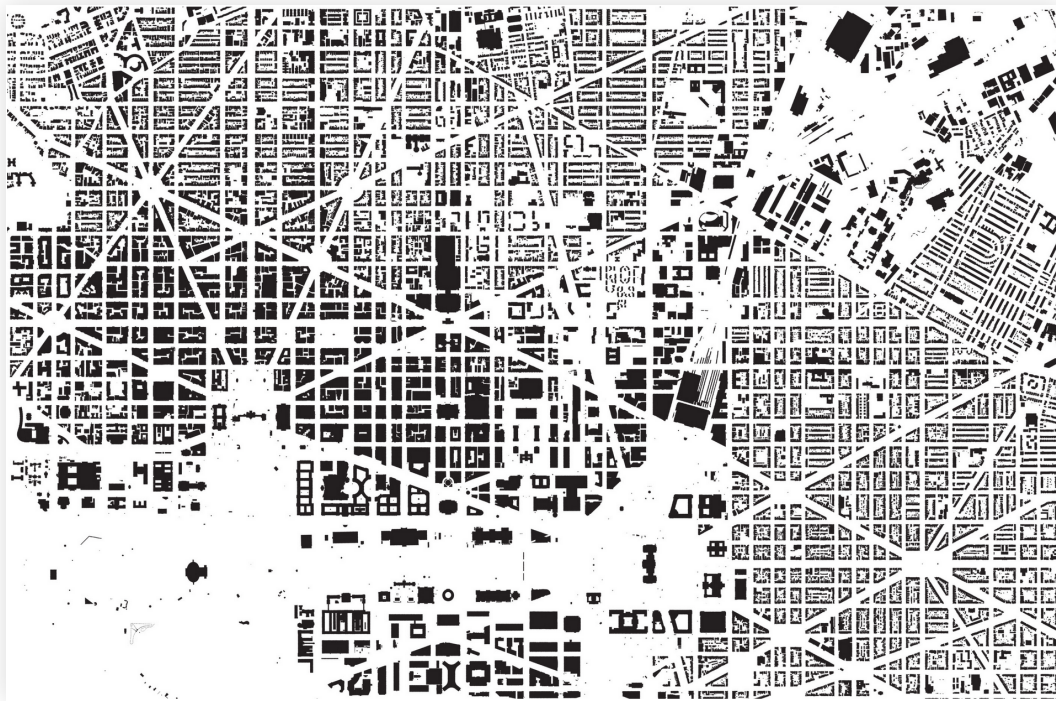
**The
Alan Turing
Institute**



Geographic
Data Science
Lab

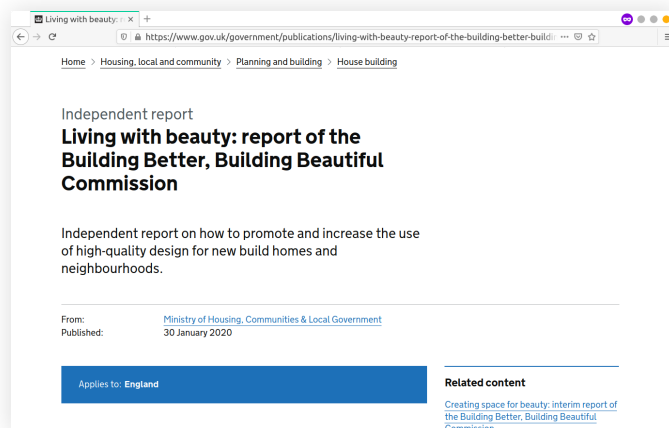
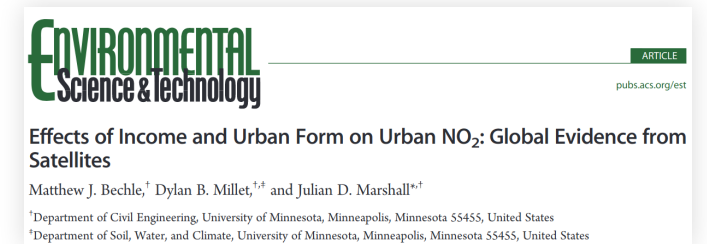
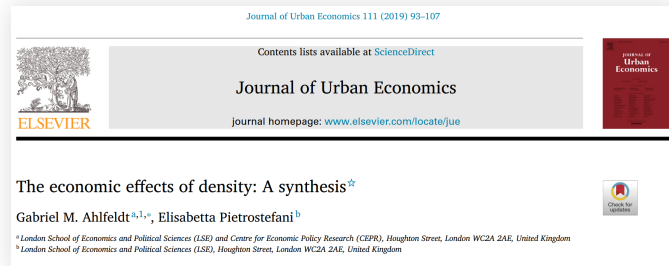
“The point”

How we arrange “stuff” in cities matters...



Source: *A map of every building in America* (New York Times)

... it matters *a lot*



Form & Function

Form

What does it look like?

“Physical structure and appearance of cities”

Function

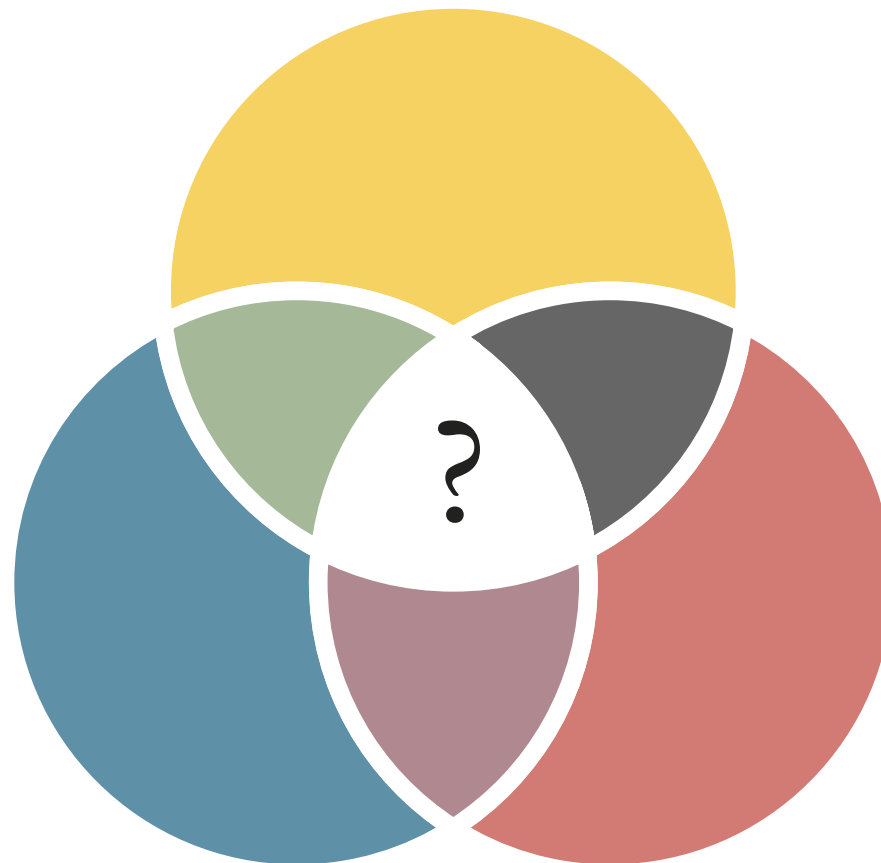
What is it used for?

“Activities that take place within an environment”

detailed

scalable

consistent



Spatial Signatures

*A characterisation of space based on form and function
designed to understand urban environments*

*A characterisation of space based on form and function
designed to understand urban environments*

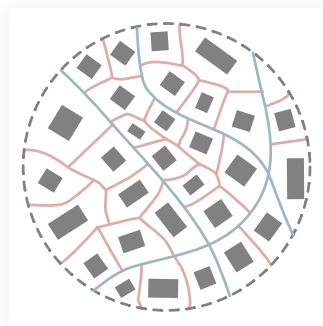
*A characterisation of space based on form and function
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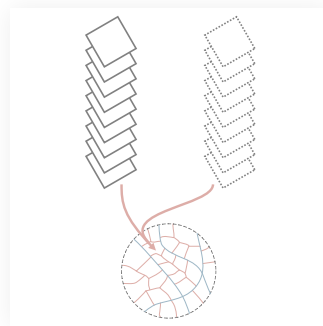
Building *Spatial Signatures*

[STAGE] Delimiters Enclosure Anchors Encl. Tess. Characters Clusters Signatures

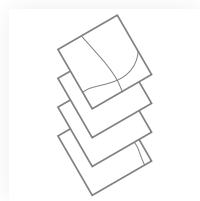
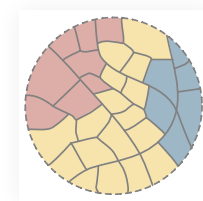
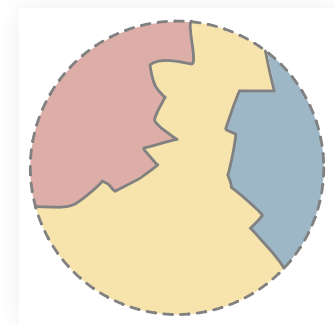
Enclosed
Tessellation



Embedding
form & function



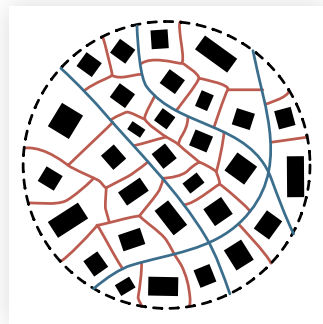
Spatial
Signatures



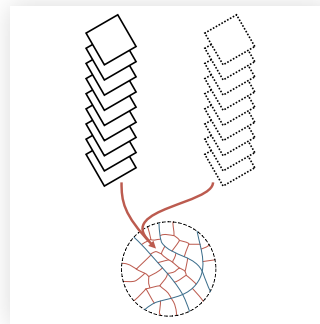
Building *Spatial Signatures*

[STAGE] Delimiters Enclosure Anchors Encl. Tess. Characters Clusters Signatures

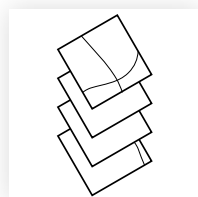
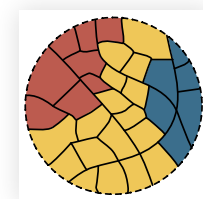
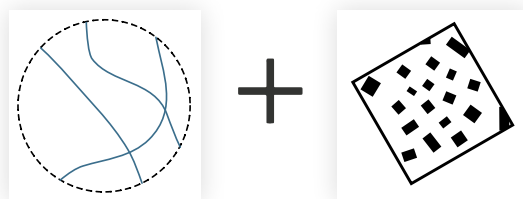
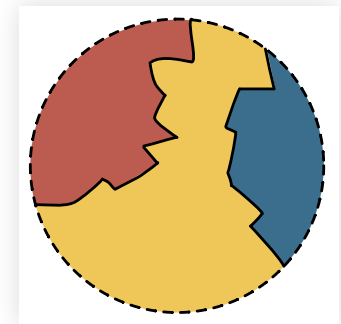
Enclosed
Tessellation



Embedding
form & function



Spatial
Signatures



Great Britain

Characters

Form

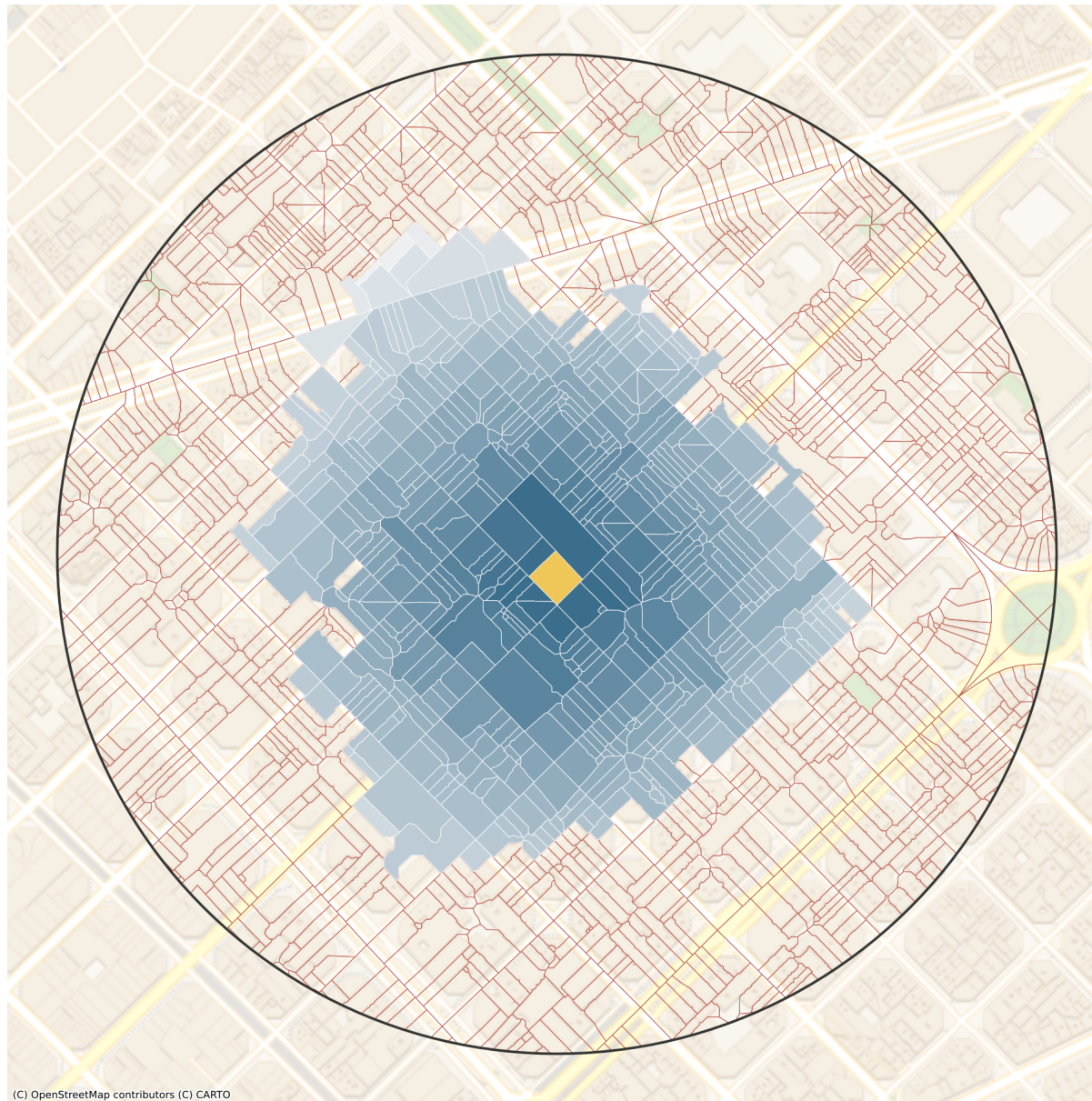
- Dimension
- Shape
- Intensity
- Connectivity
- Diversity

Function

- Population
- Employment
- Industry
- Land
use/cover
- Amenity access

$N \approx 300$

Context



Data

Form

- OS OpenMap
- OS OpenRoads

Function

- (Business) Census
- OpenStreetMap
- Geolytix
- Listed buildings
- CDRC
- CORINE /
Sentinel 2
- VIIRS

British Signatures

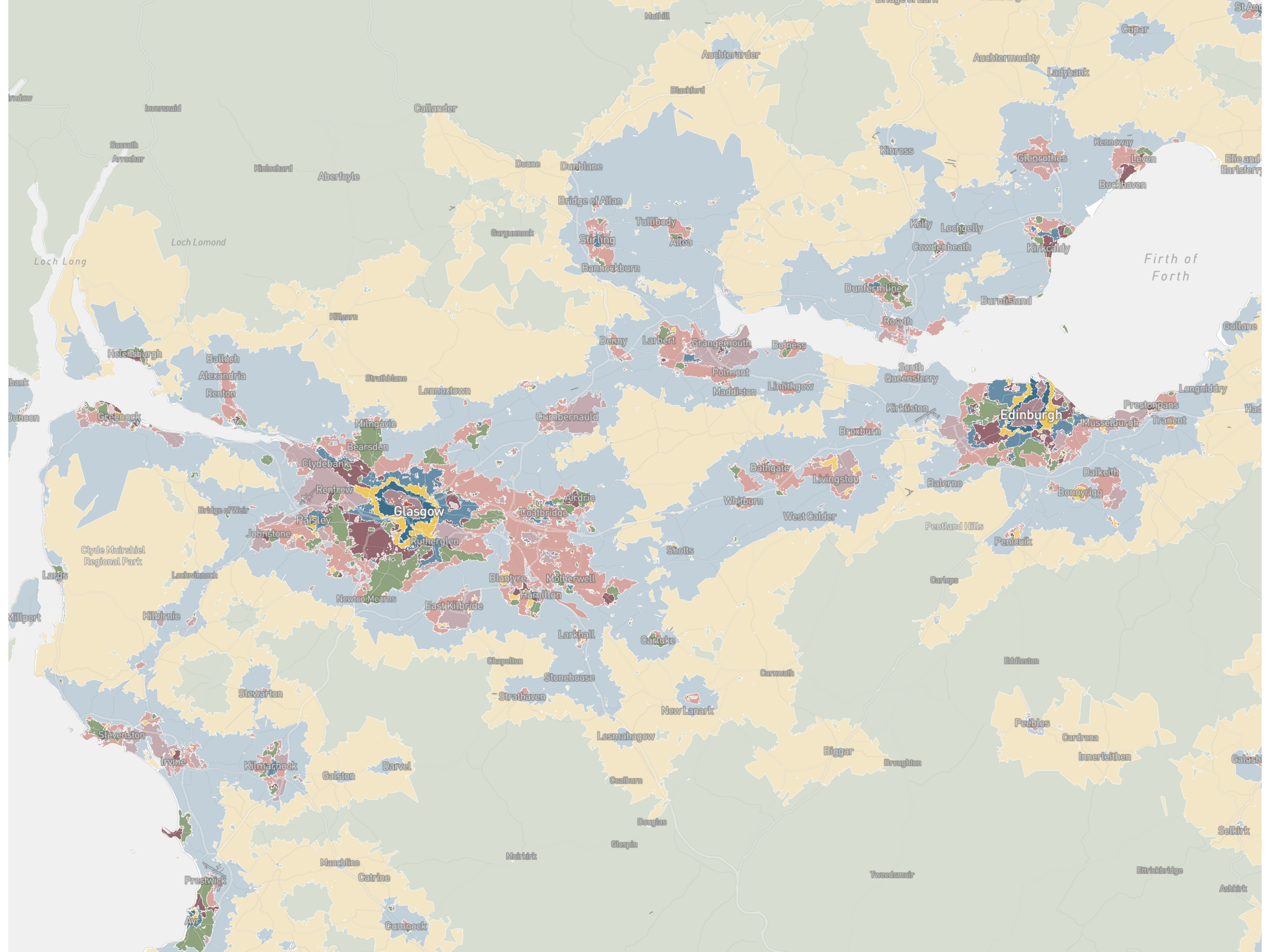
BRITISH SIGNATURES

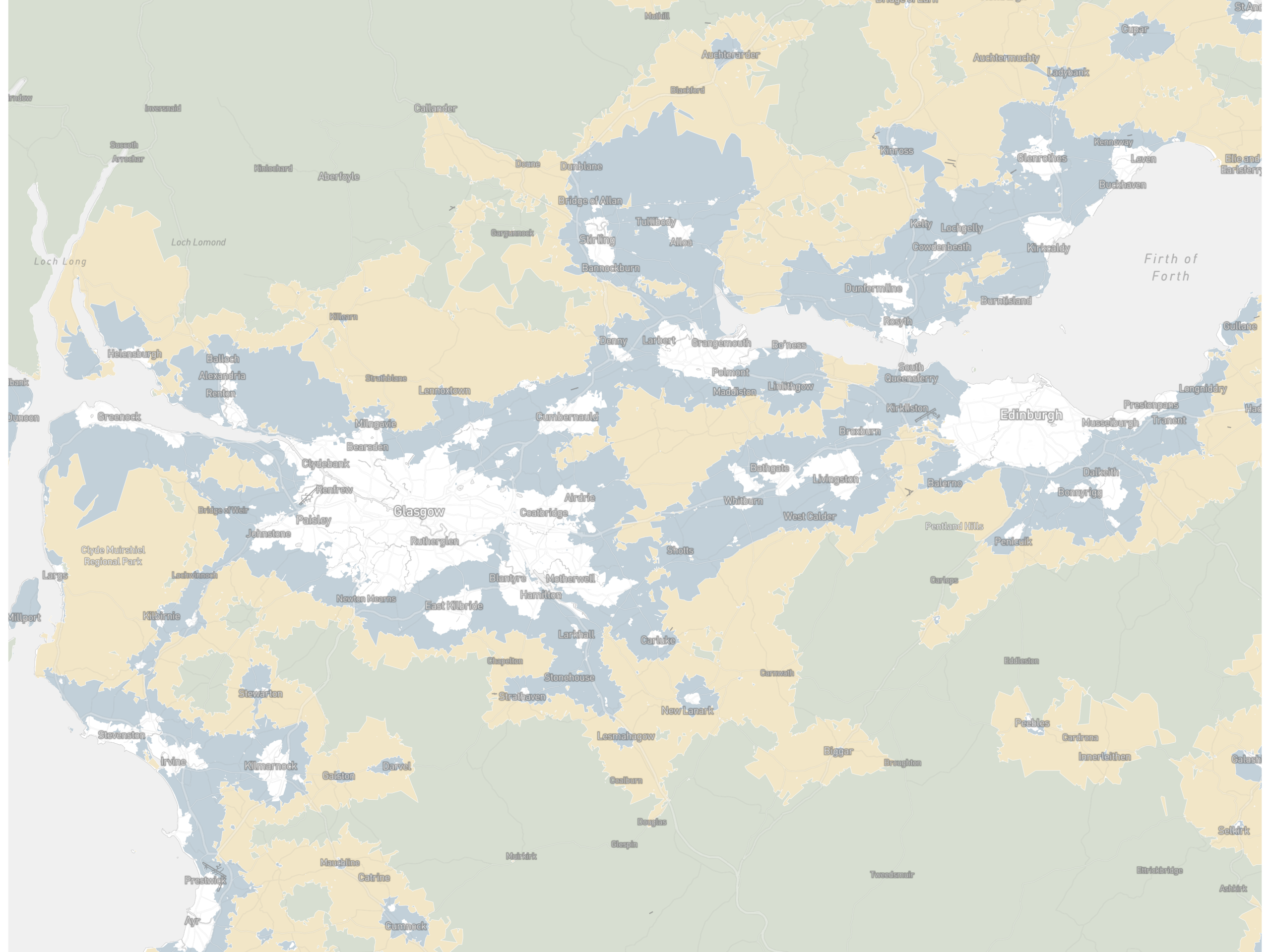
Countryside (3) 

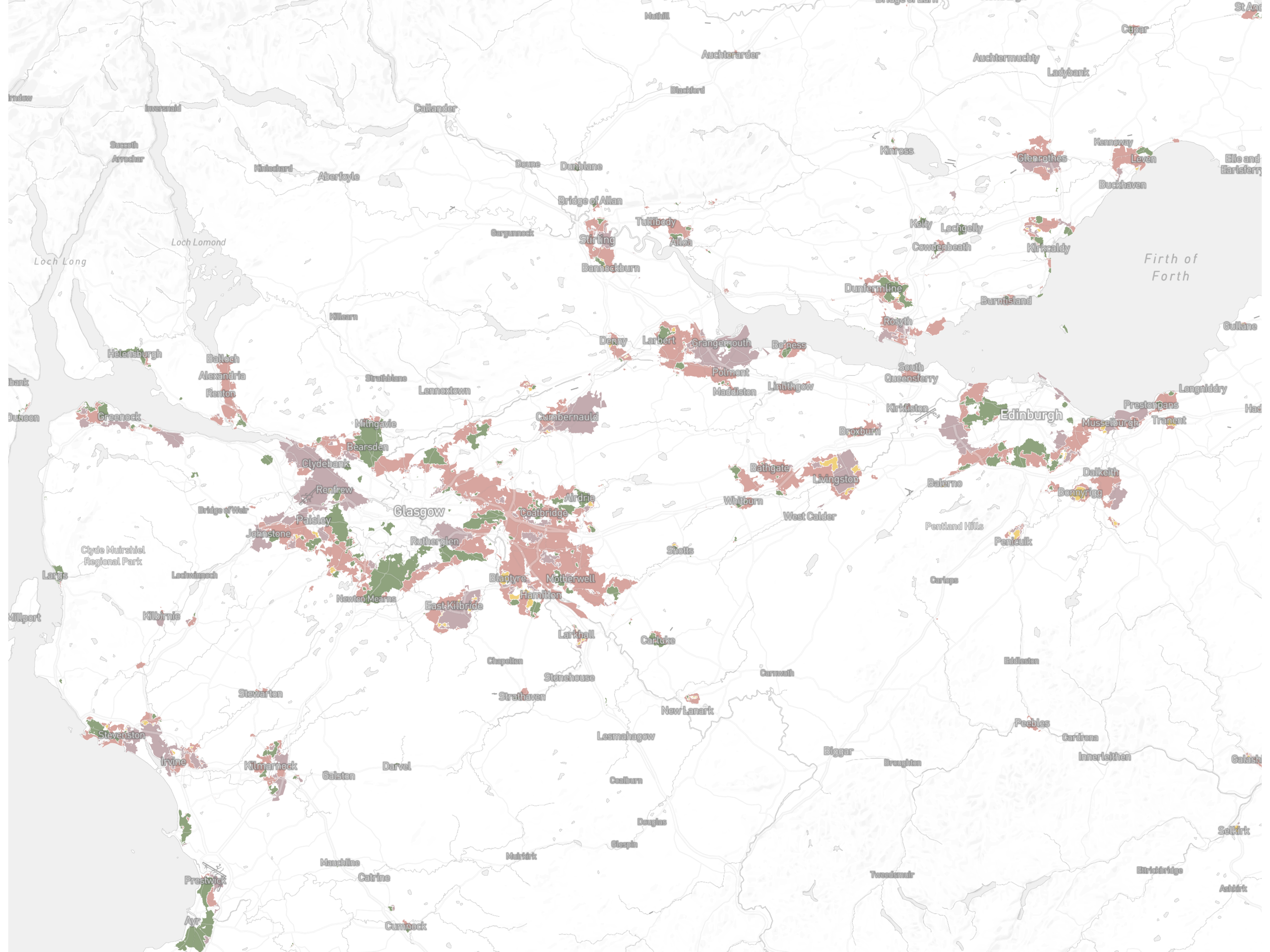
Periphery (4) 

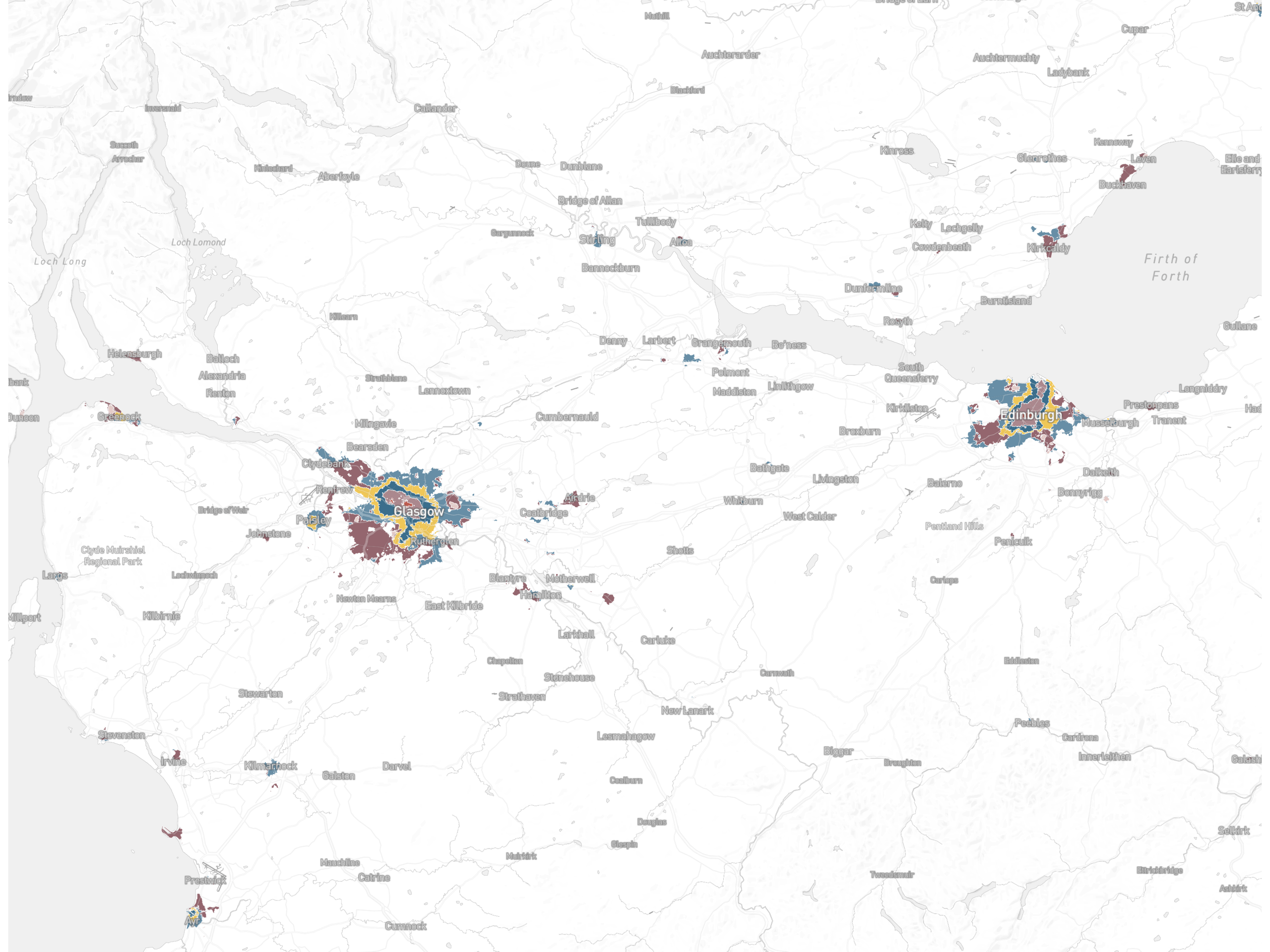
Urban (9)



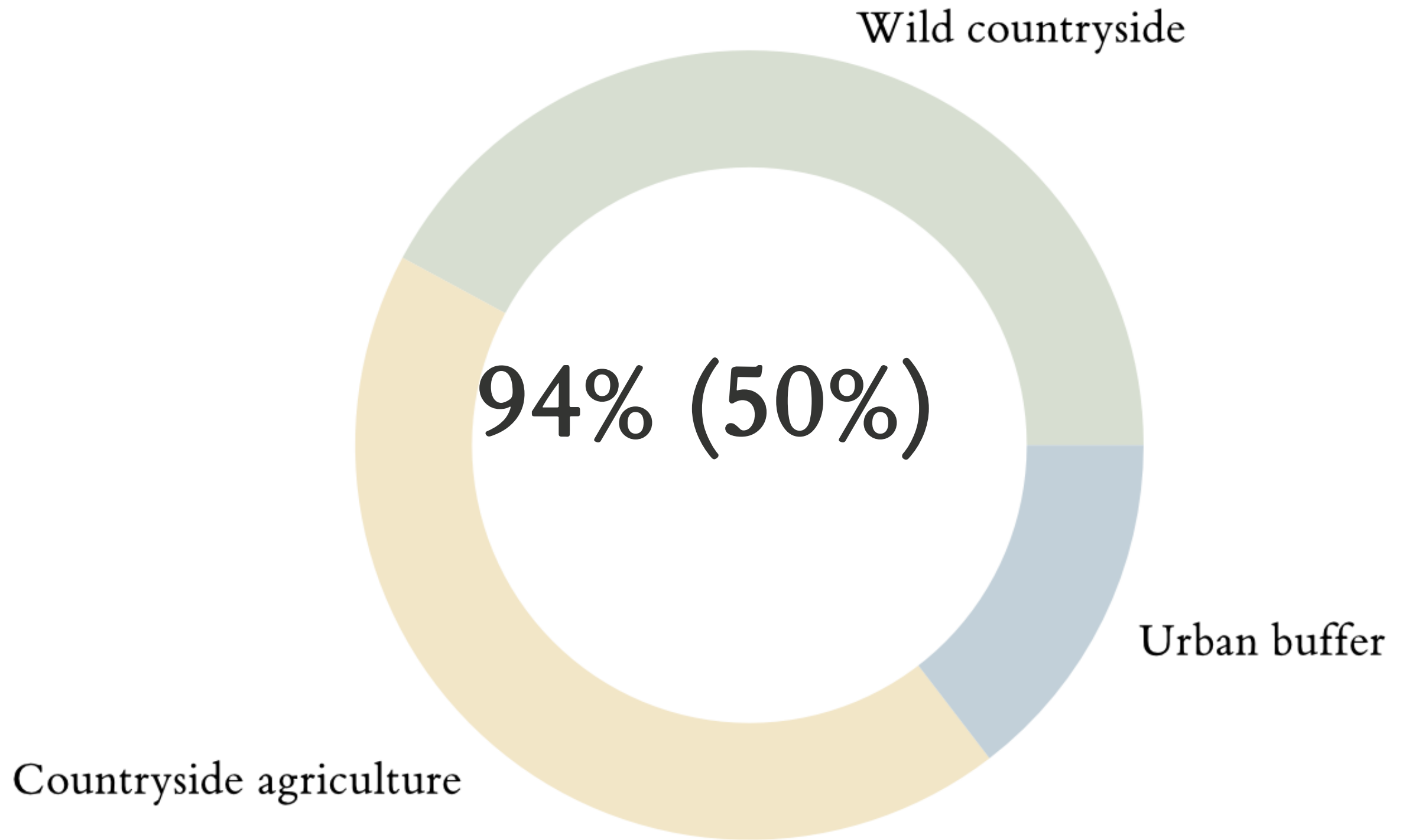








(Geographical) Coverage



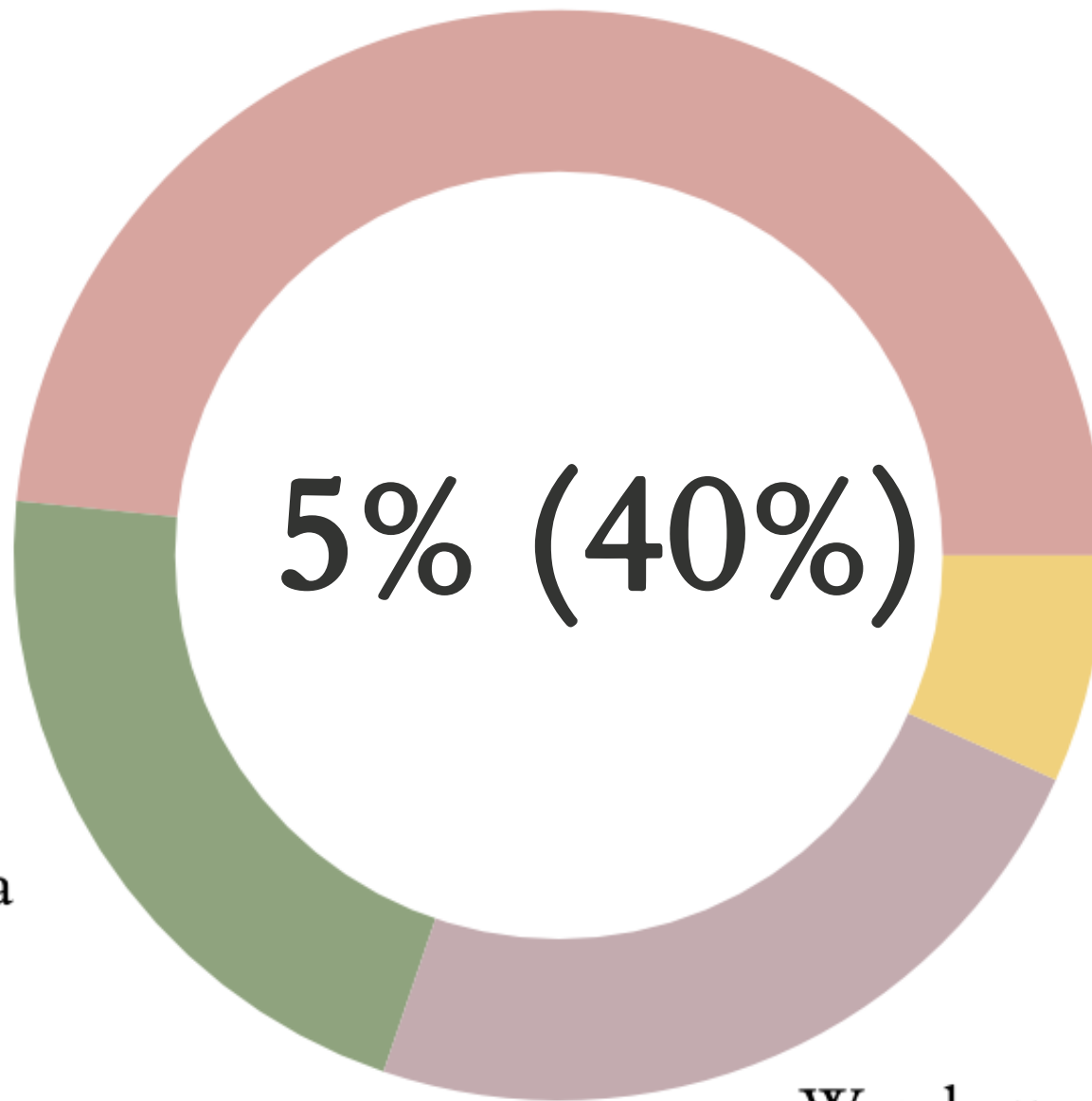
Open sprawl

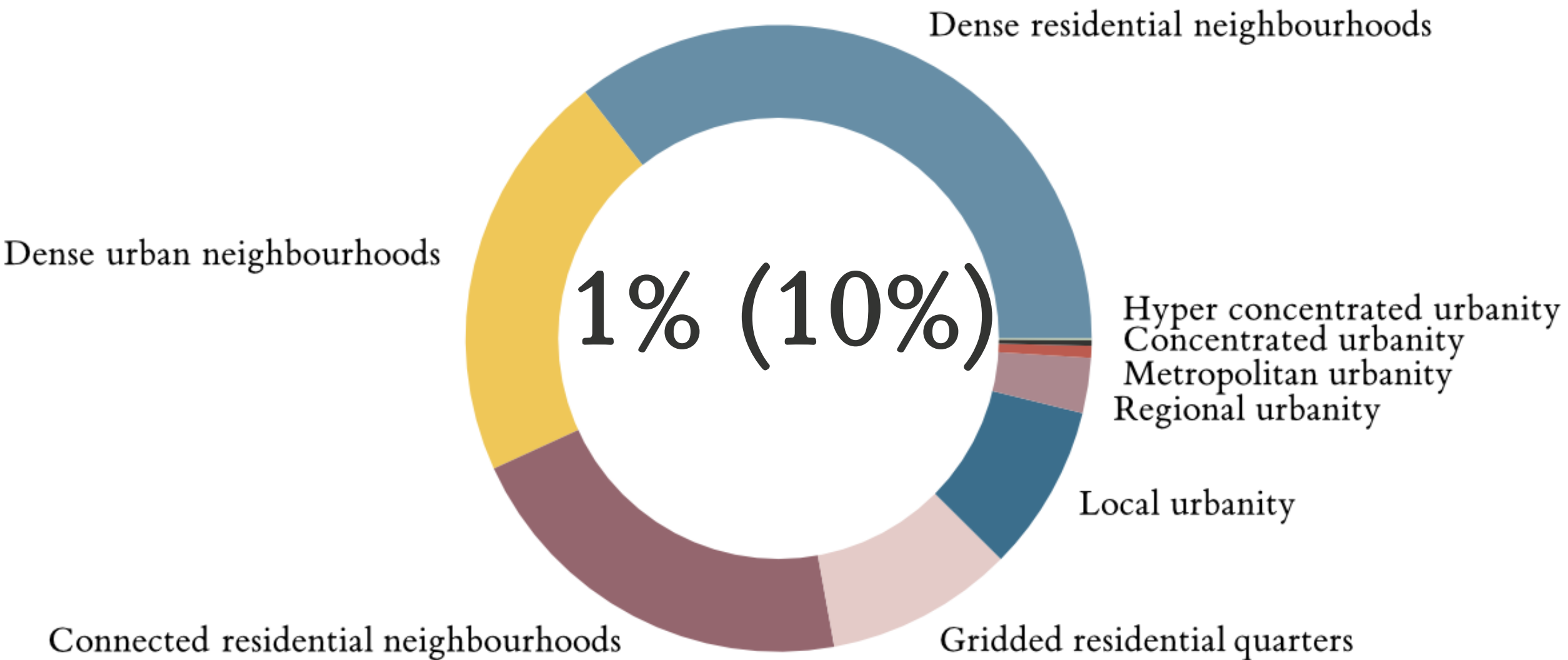
5% (40%)

Disconnected suburbia

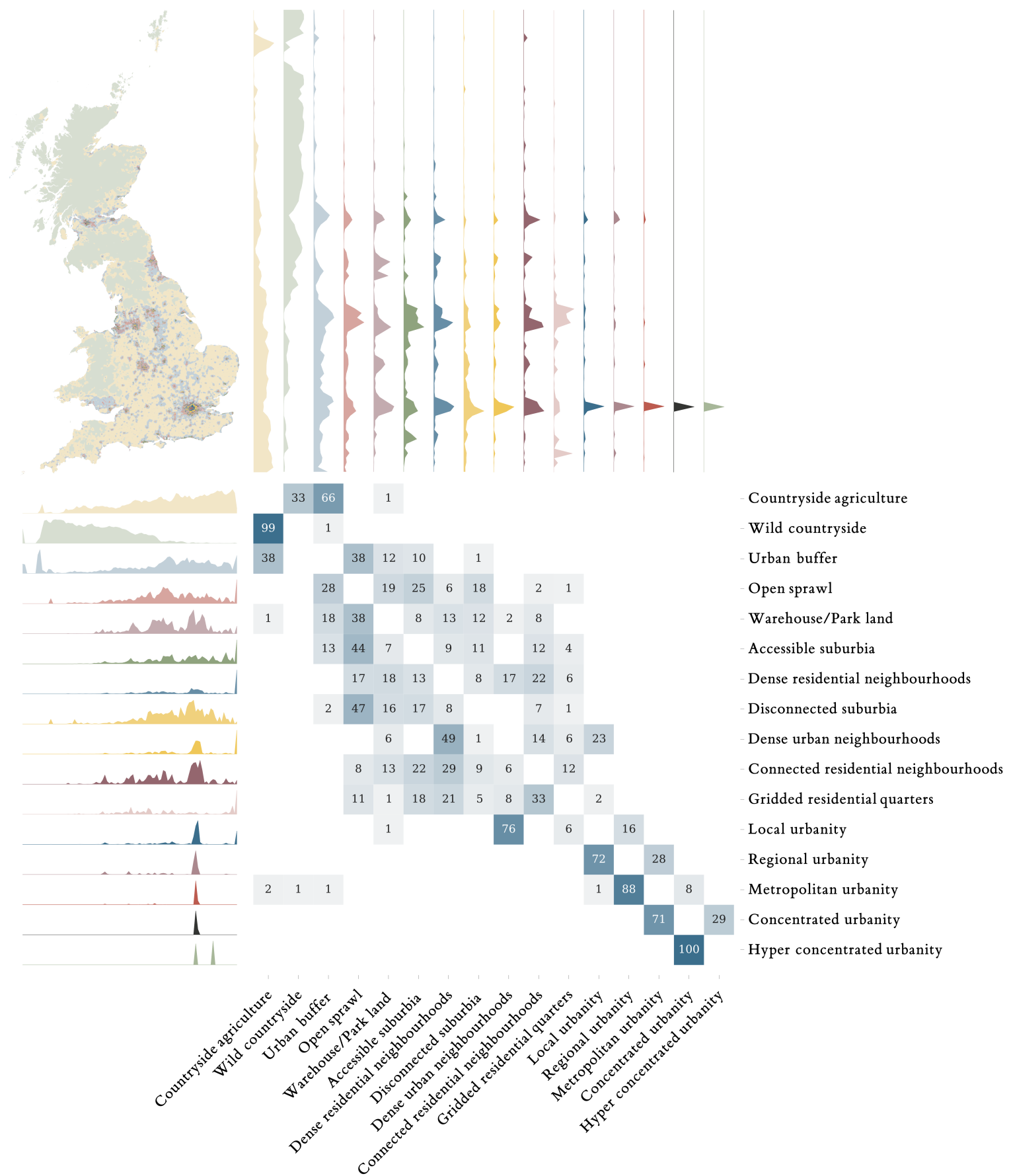
Accessible suburbia

Warehouse/Park land

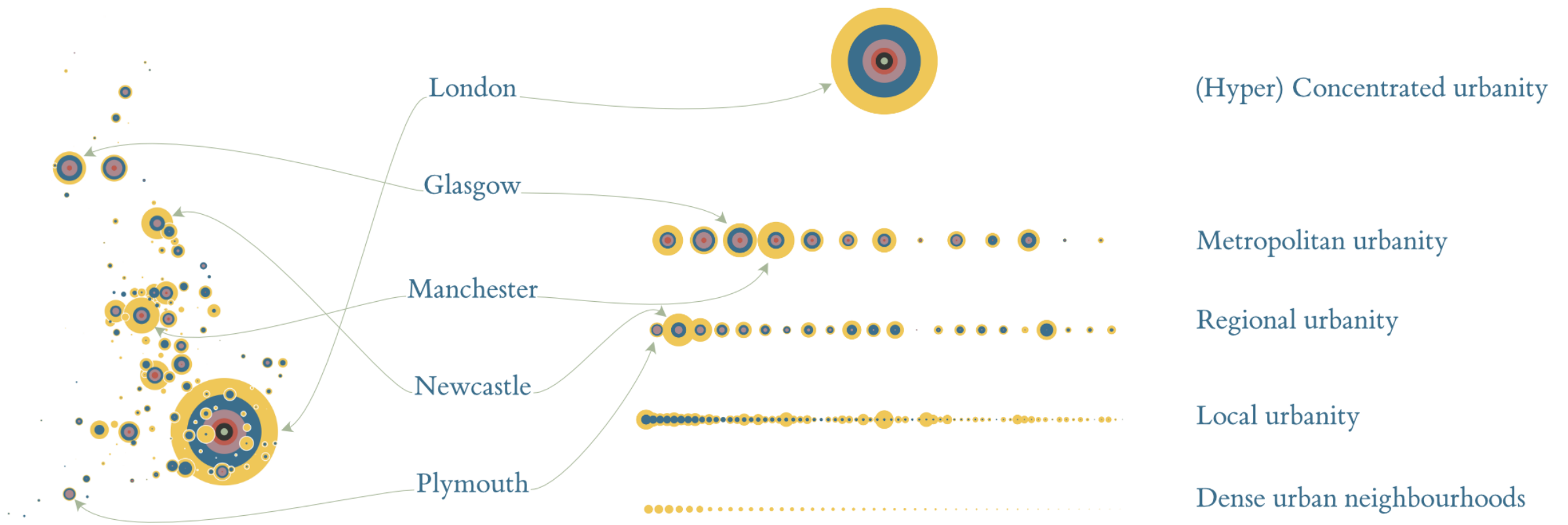




Distribution/co-occurrence



Urban hierarchy



Signature drivers

Conclusions

1. Urban *form* and *function* matters
2. **Spatial Signatures**: F&F for cities, in detail, at scale
3. Good **measurement** → better **understanding**

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