

Spatial Signatures

(Urban) Form & Function in Great Britain

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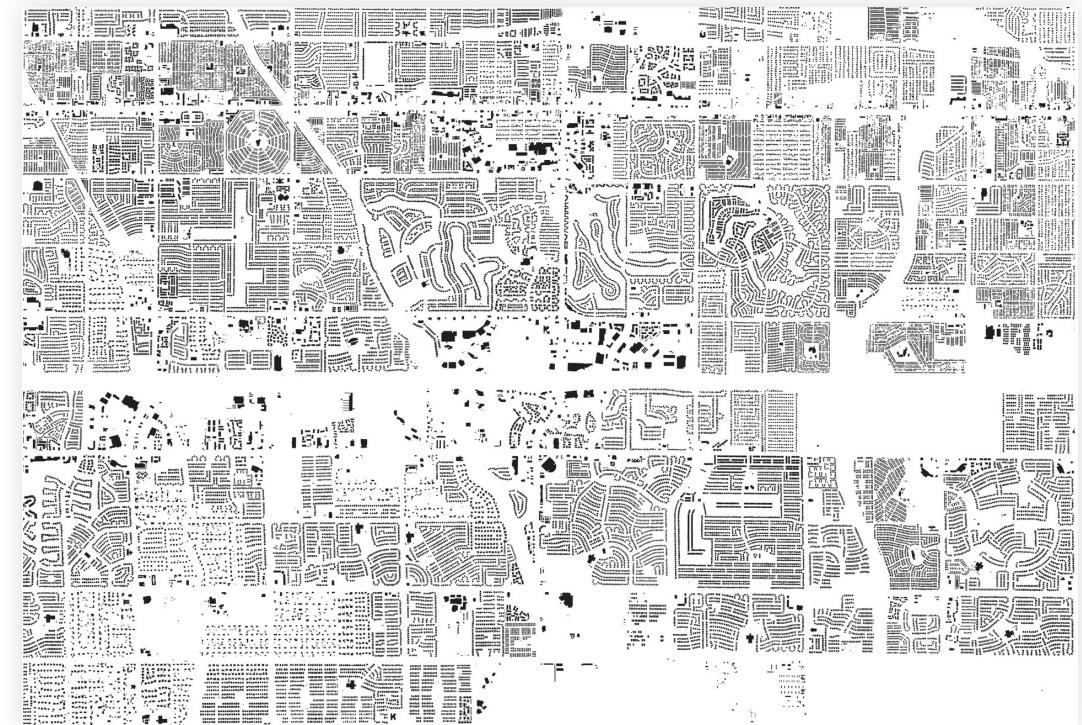
The
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Geographic
Data Science
Lab

“The point”

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



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

... it matters *a lot*

Journal of Urban Economics 111 (2019) 93–107
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The economic effects of density: A synthesis[☆]
Gabriel M. Ahlfeldt^{a,1,*}, Elisabetta Pietrostefani^b
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Cities in Bad Shape: Urban Geometry in India - American Economic Association — Mozilla Firefox

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Cities in Bad Shape: Urban Geometry in India

Mariaflavia Harari

AMERICAN ECONOMIC REVIEW
VOL. 110, NO. 8, AUGUST 2020
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ARTICLE
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Environmental Science & Technology

Effects of Income and Urban Form on Urban NO₂: Global Evidence from Satellites
Matthew J. Bechle,[†] Dylan B. Millet,^{†,‡} and Julian D. Marshall^{*,†}
[†]Department of Civil Engineering, University of Minnesota, Minneapolis, Minnesota 55455, United States
[‡]Department of Soil, Water, and Climate, University of Minnesota, Minneapolis, Minnesota 55455, United States

Living with beauty: report of the Building Better, Building Beautiful Commission

Independent report on how to promote and increase the use of high-quality design for new build homes and neighbourhoods.

From: Ministry of Housing, Communities & Local Government
Published: 30 January 2020

Applies to: England

Related content
[Creating space for beauty: interim report of the Building Better, Building Beautiful Commission](#)

Rethinking Urban Sprawl MOVING TOWARDS SUSTAINABLE CITIES



OECD

NEW URBAN AGENDA

H | III | UN

Form

What does it look like?

“Physical structure and appearance of cities”

Function

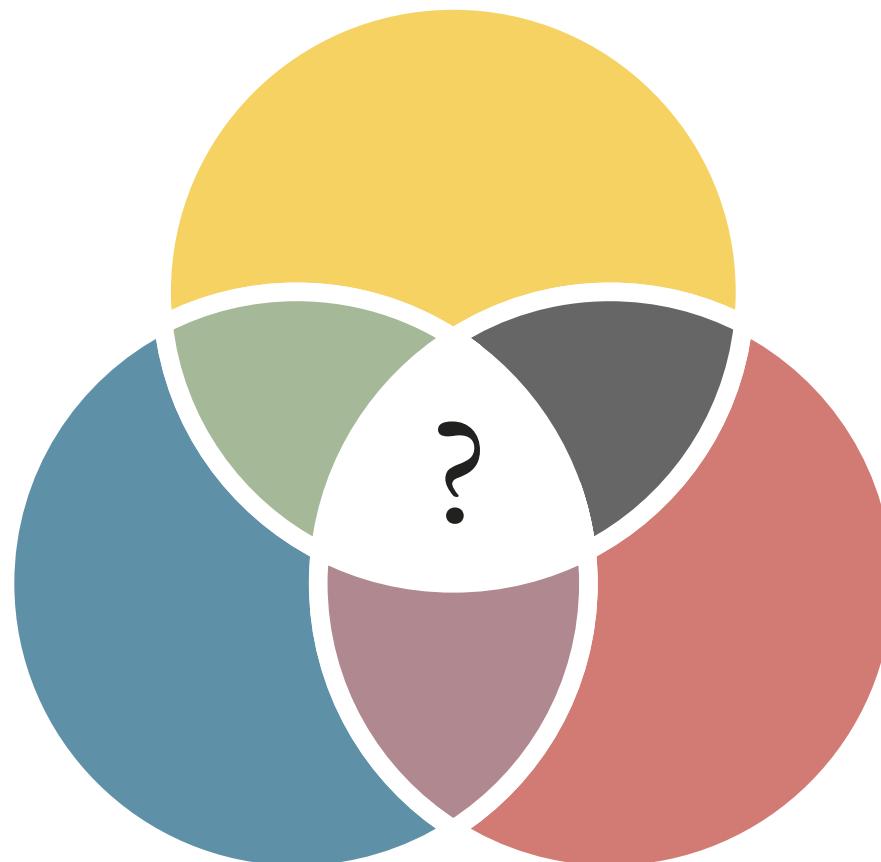
What is it used for?

“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*

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designed to understand urban environments*

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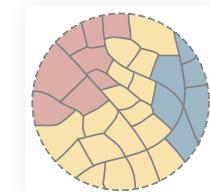
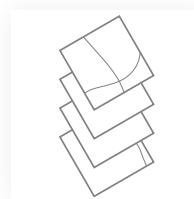
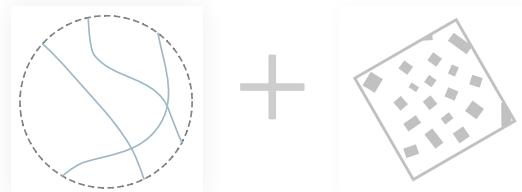
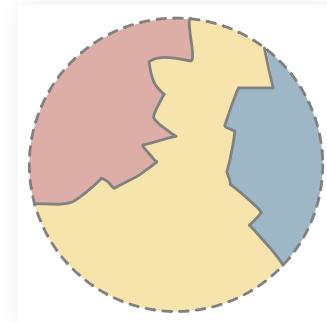
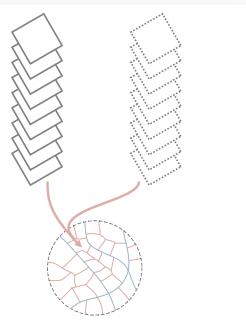
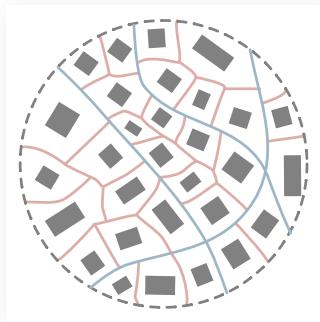
Building *Spatial Signatures*

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

Enclosed
Tessellation

Embedding
form & function

Spatial
Signatures



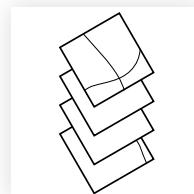
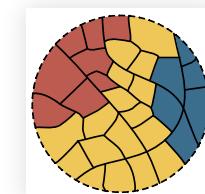
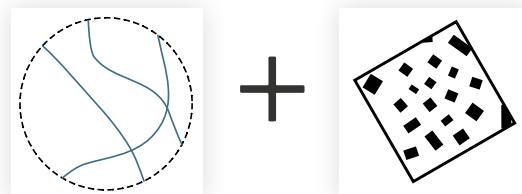
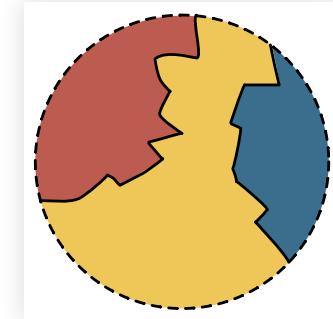
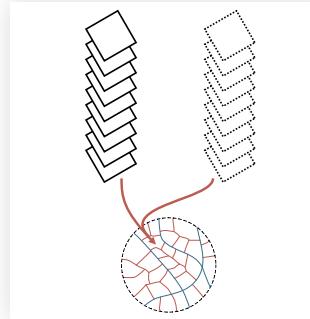
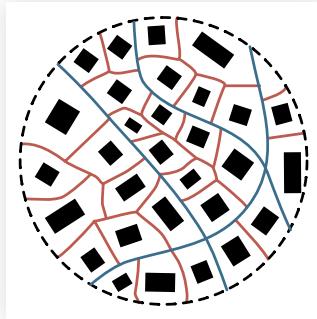
Building Spatial Signatures

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

Enclosed
Tessellation

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Spatial
Signatures



Great Britain

Characters

Form

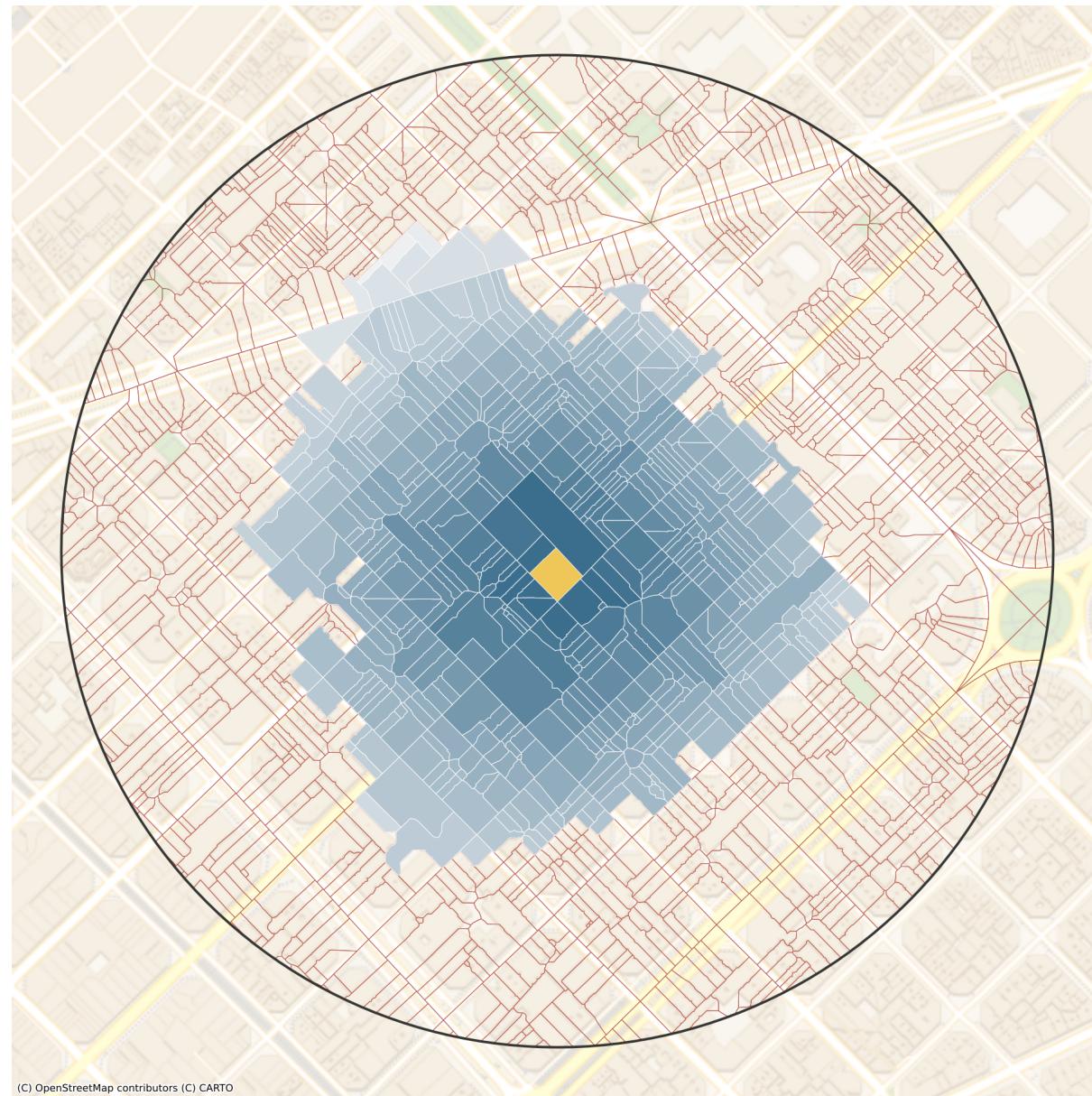
- Dimension
- Shape
- Intensity
- Connectivity
- Diversity

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

P A R E N T A L
A D V I S O R Y
E X P L I C I T C O N T E N T

BRITISH SIGNATURES

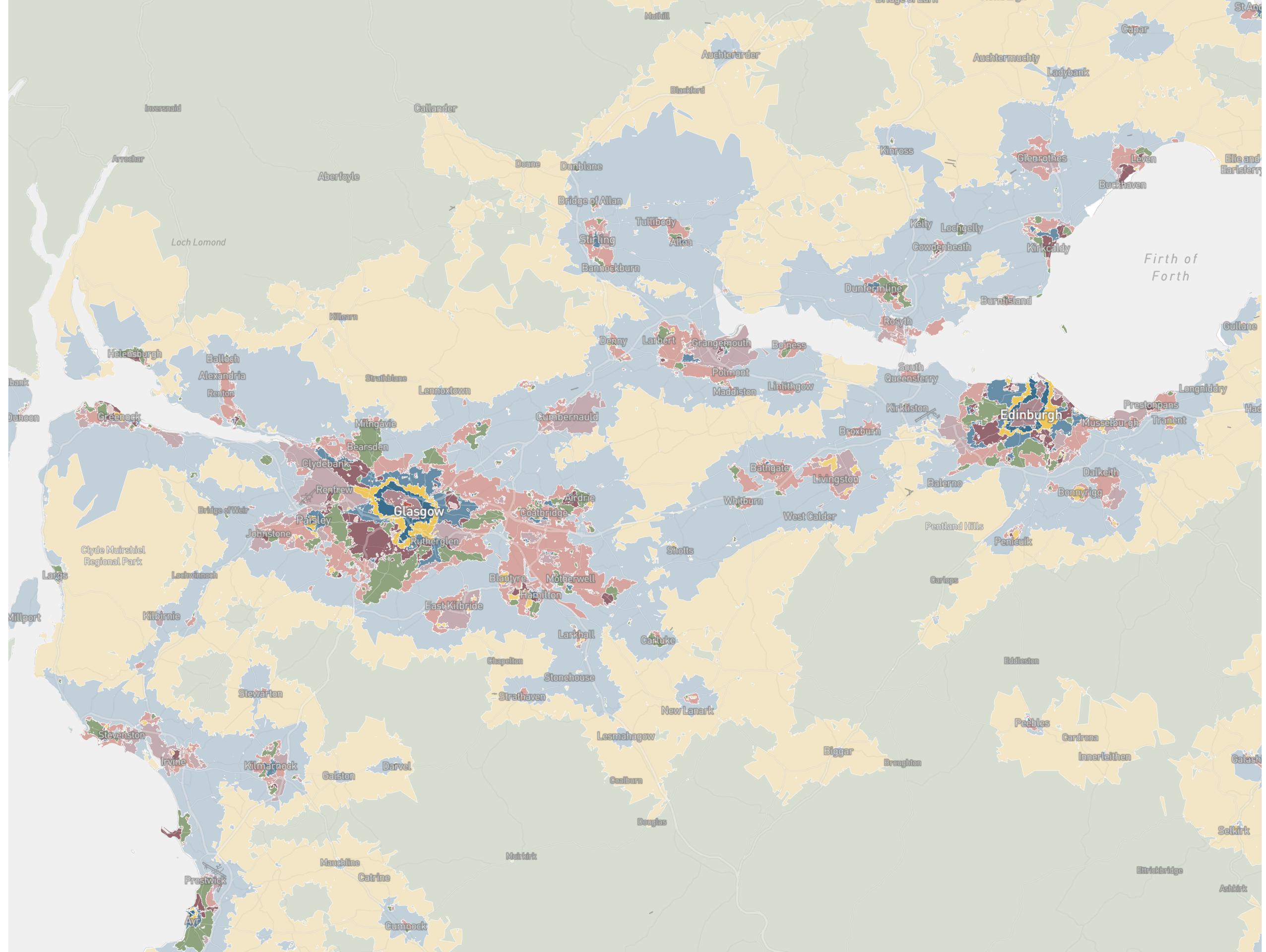
Countryside

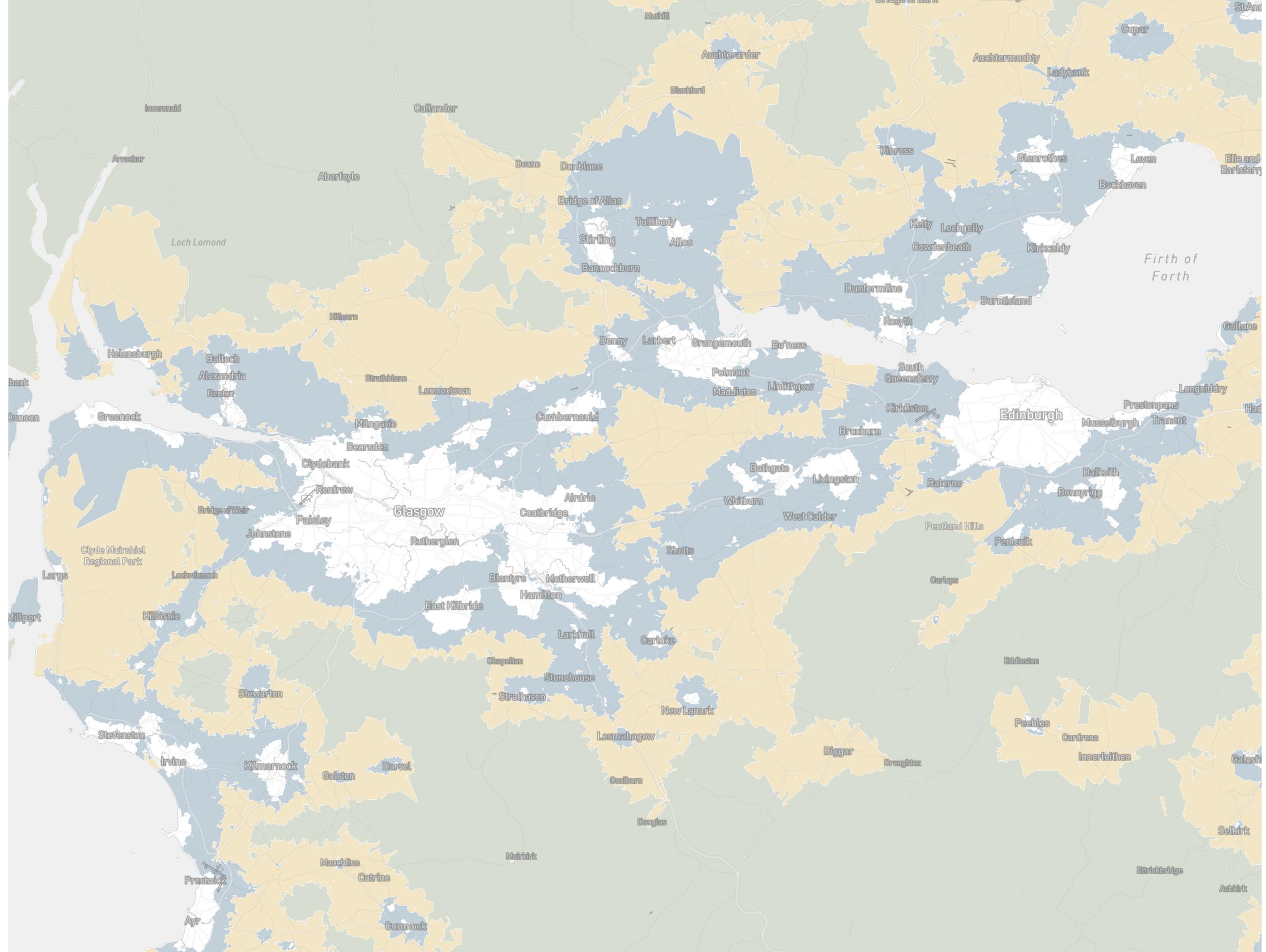
-  A horizontal bar divided into three equal segments: light yellow, light green, and light blue.

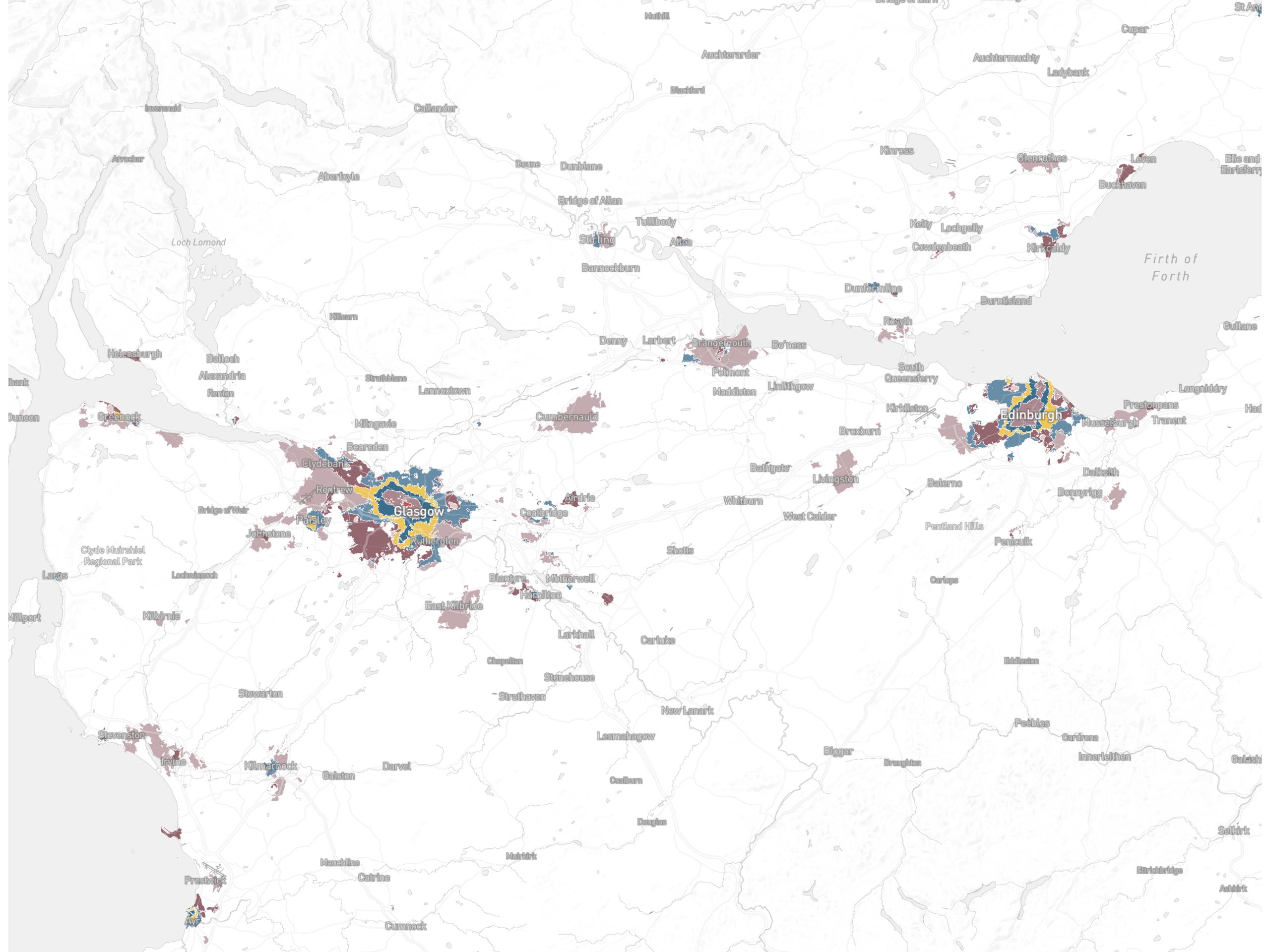
Urban Areas

- Periphery  A solid reddish-brown square.
- Suburbs  A horizontal bar divided into two equal segments: olive green and yellow.
- Cities  A horizontal bar divided into eight equal segments: teal, maroon, yellow, grey, pink, dark blue, red, and olive green.

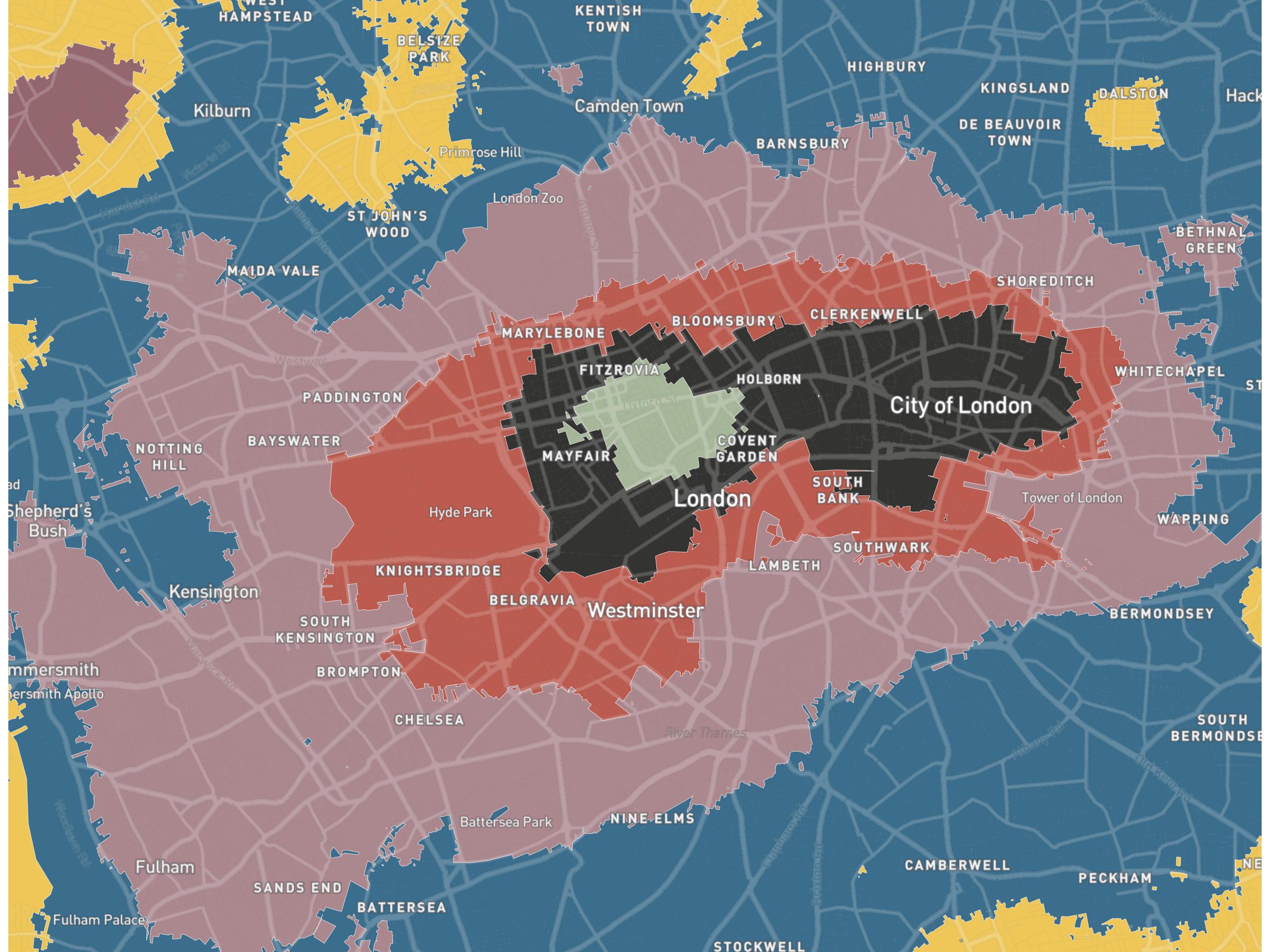


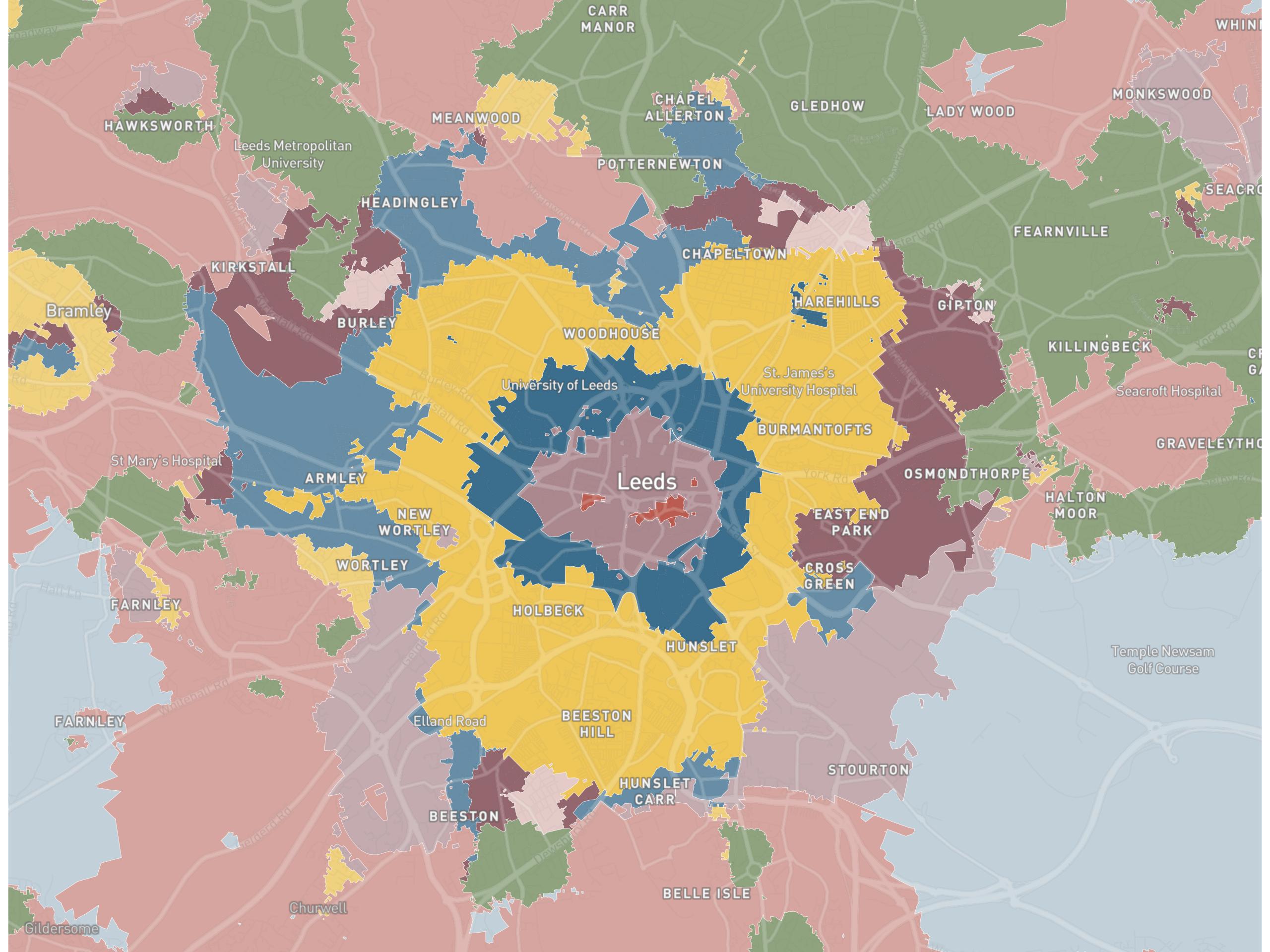


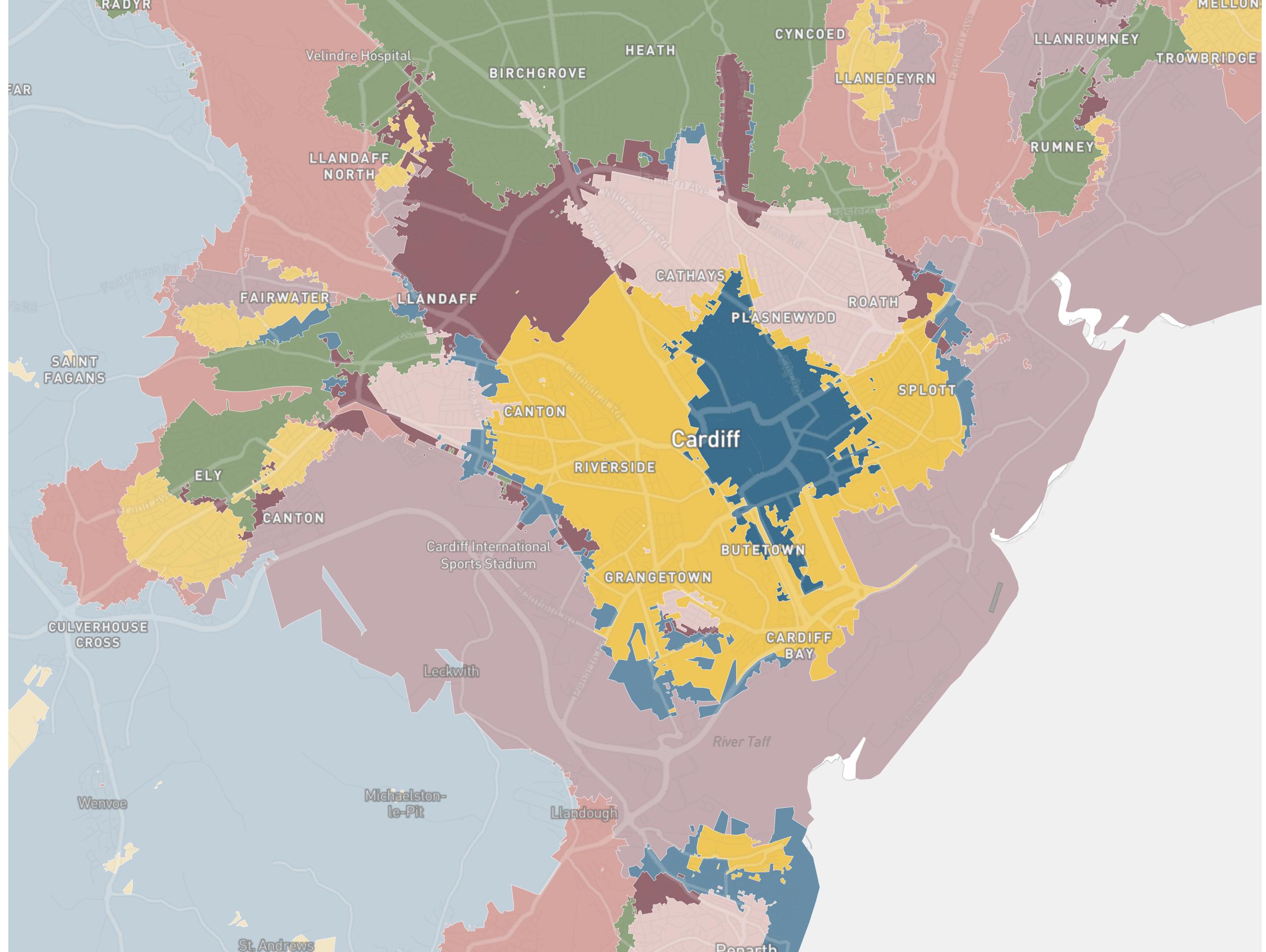


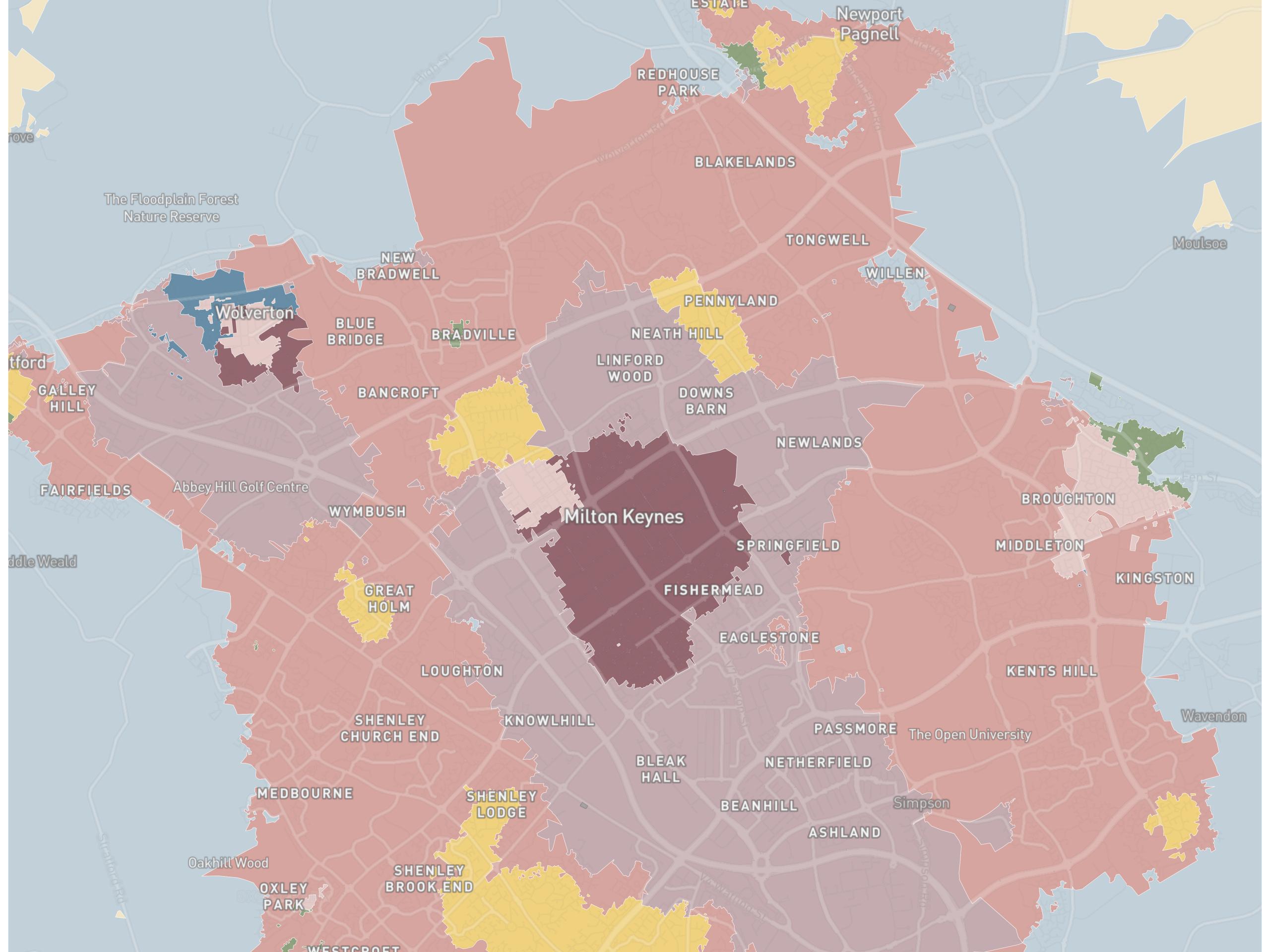


Hierarchy of *Urbanity*

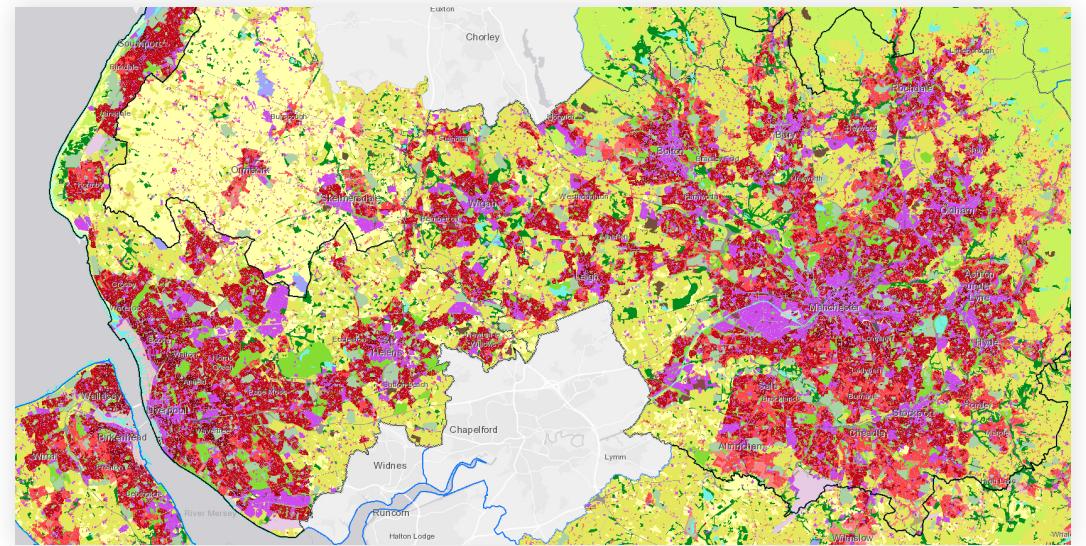
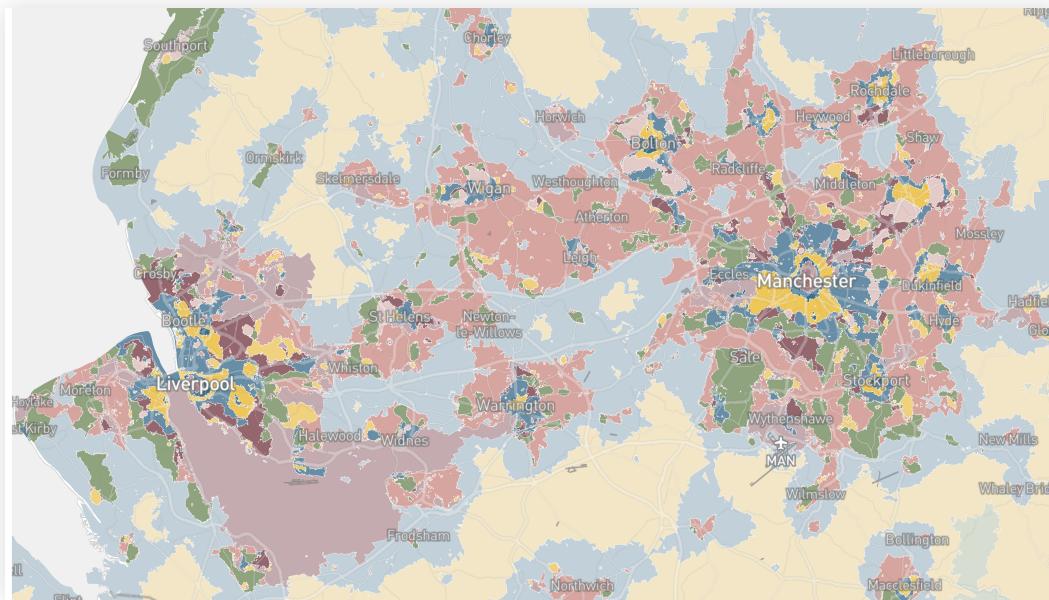




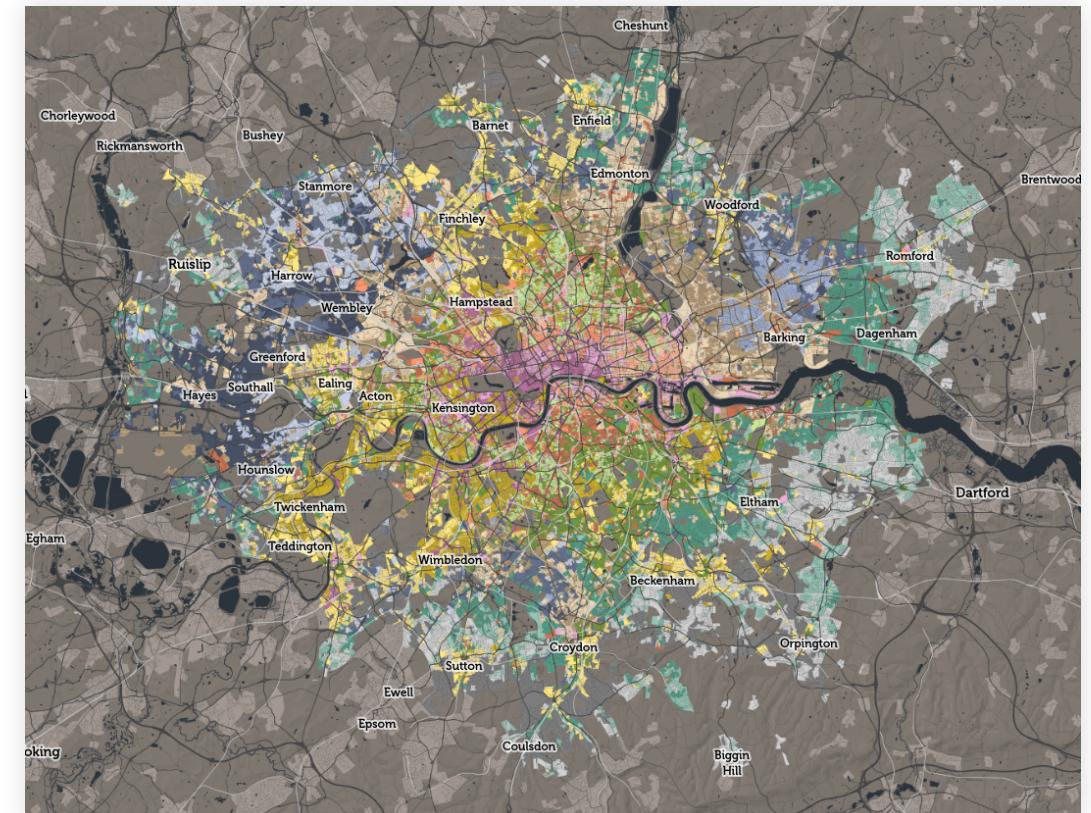
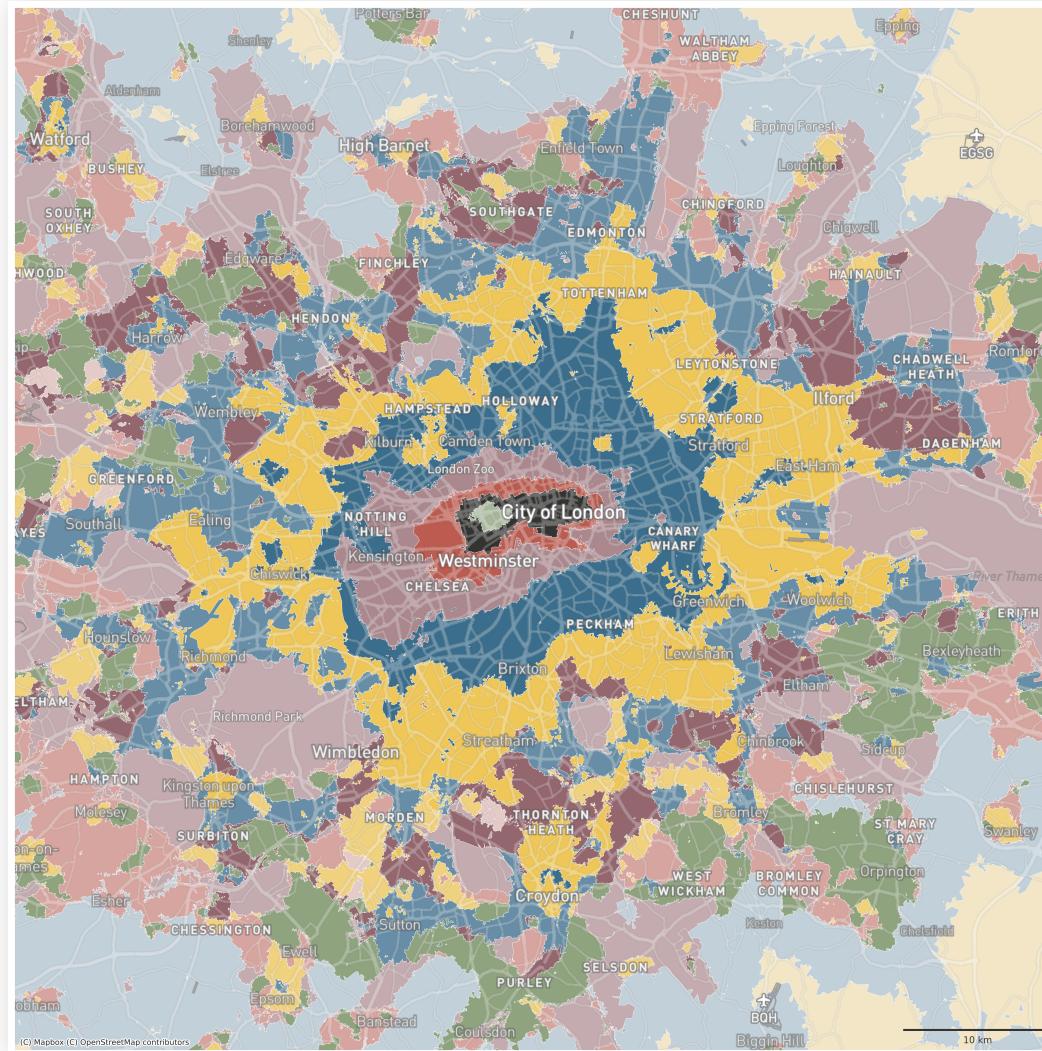




Spatial Signatures Vs Land Use



Spatial Signatures Vs Geodemographics



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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