

The spatial network



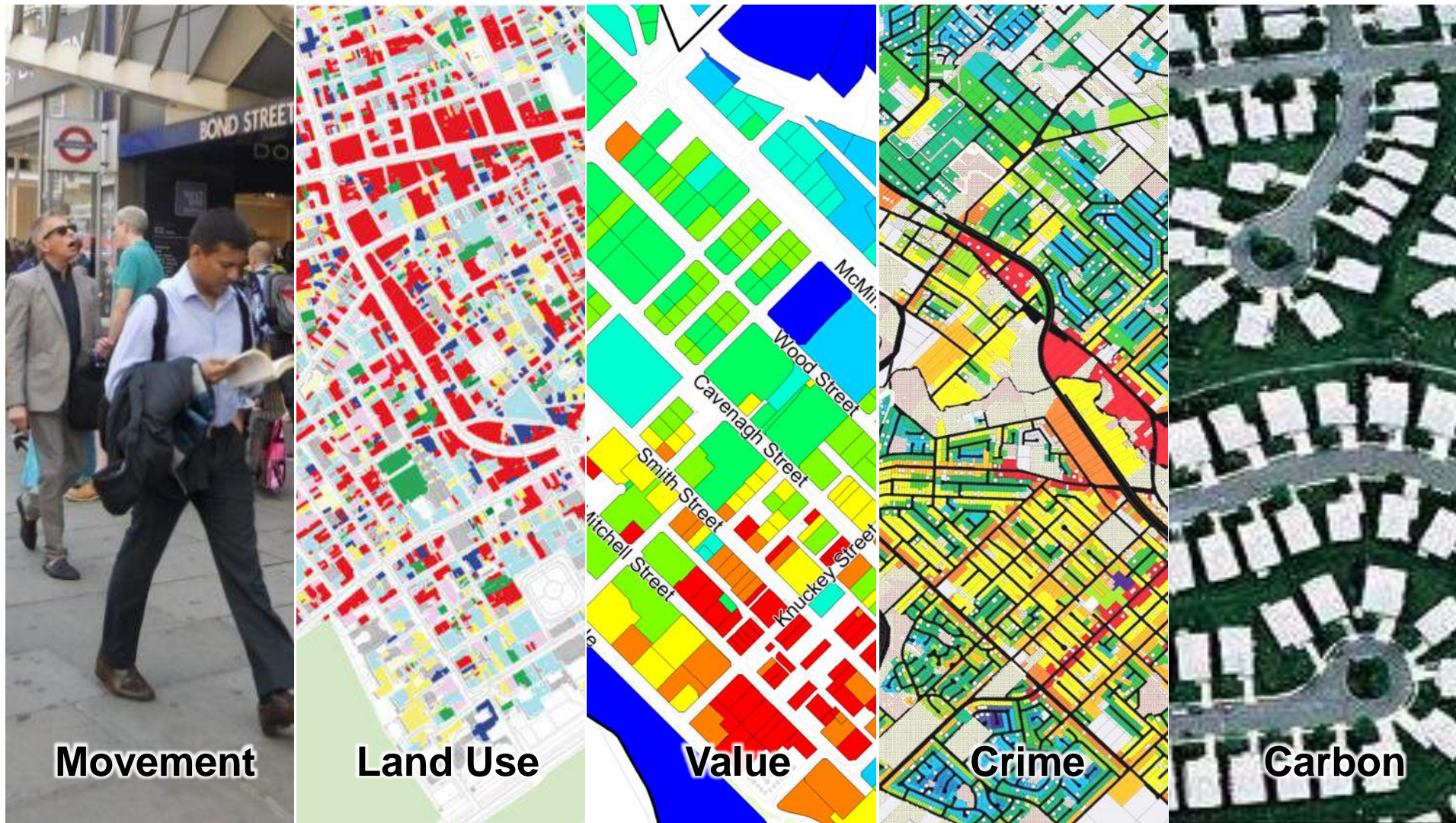
Streets and public spaces are the where people move, interact and transact

The spatial network



Cities are big spatial networks that create more of these opportunities

Five key discoveries



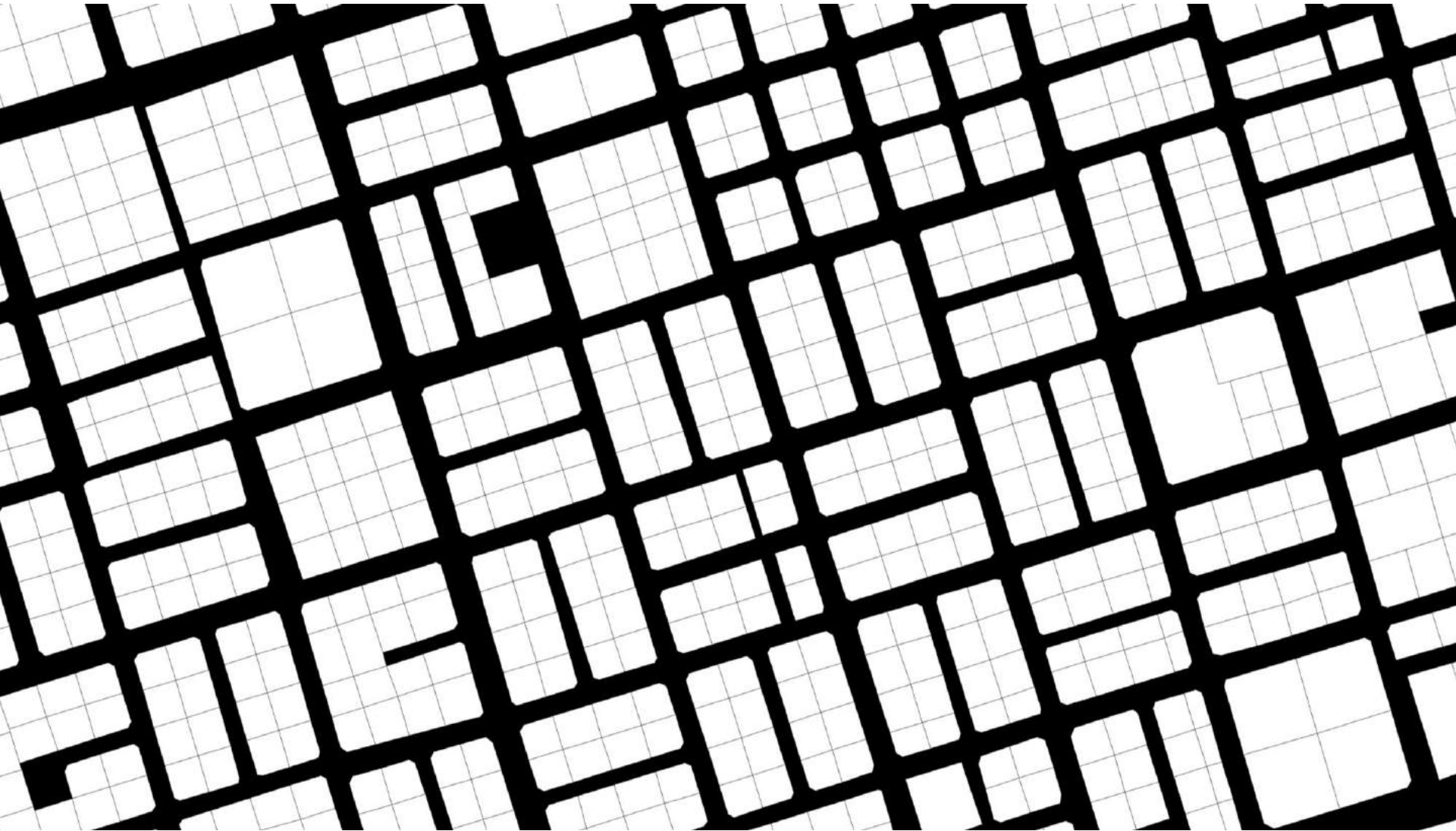
It can be modelled, analysed and used to forecast future conditions

Spatial network as infrastructure (1)



The network is slow, expensive and difficult to change (we're locked in)

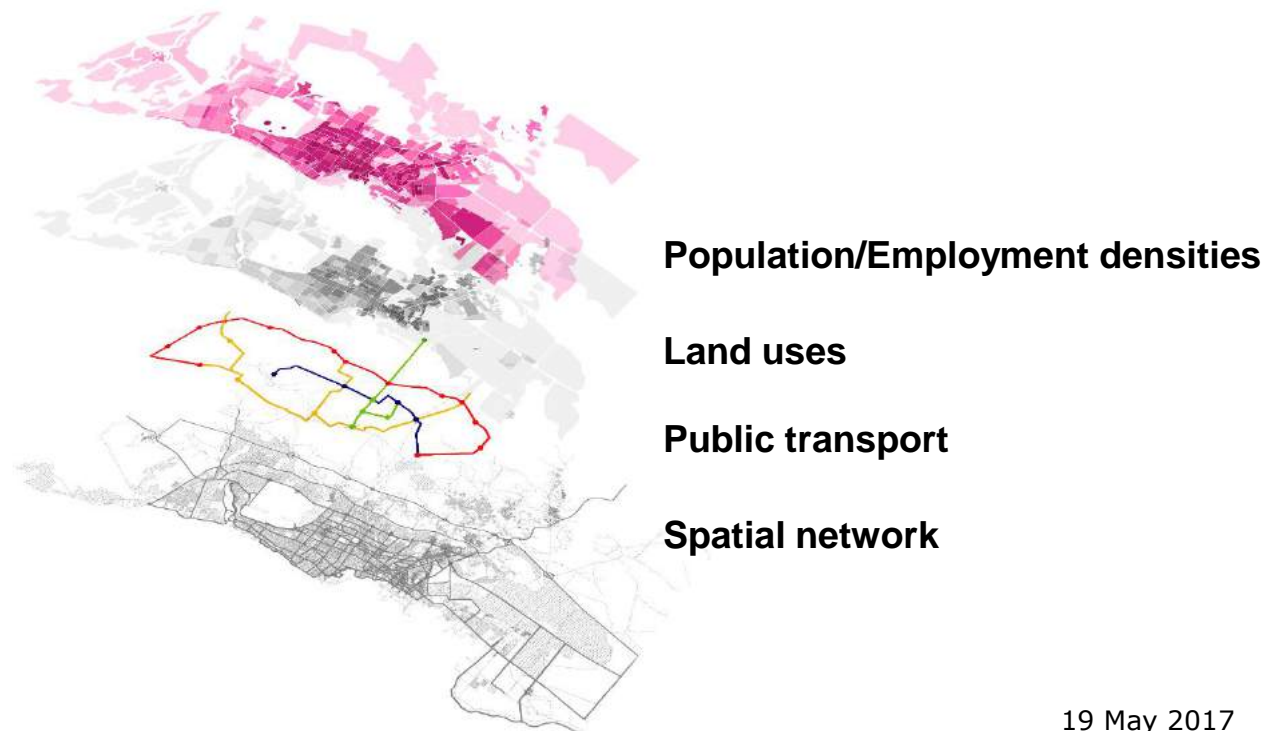
Spatial network as infrastructure (1)



As long as cities are for people the spatial network is vital

Spatial network as Infrastructure (2)

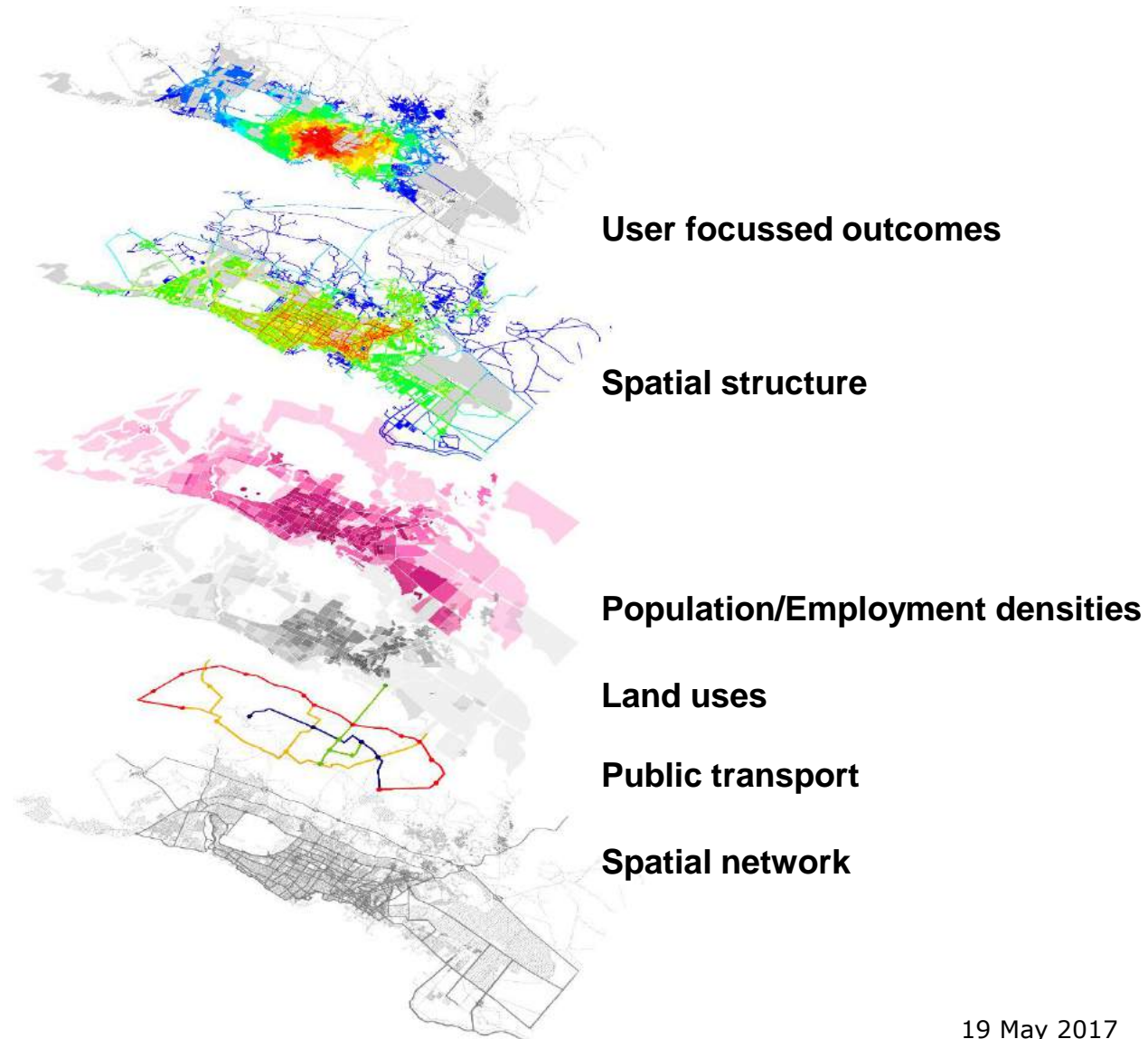
Framework to link datasets



Spatial network as Infrastructure (2)

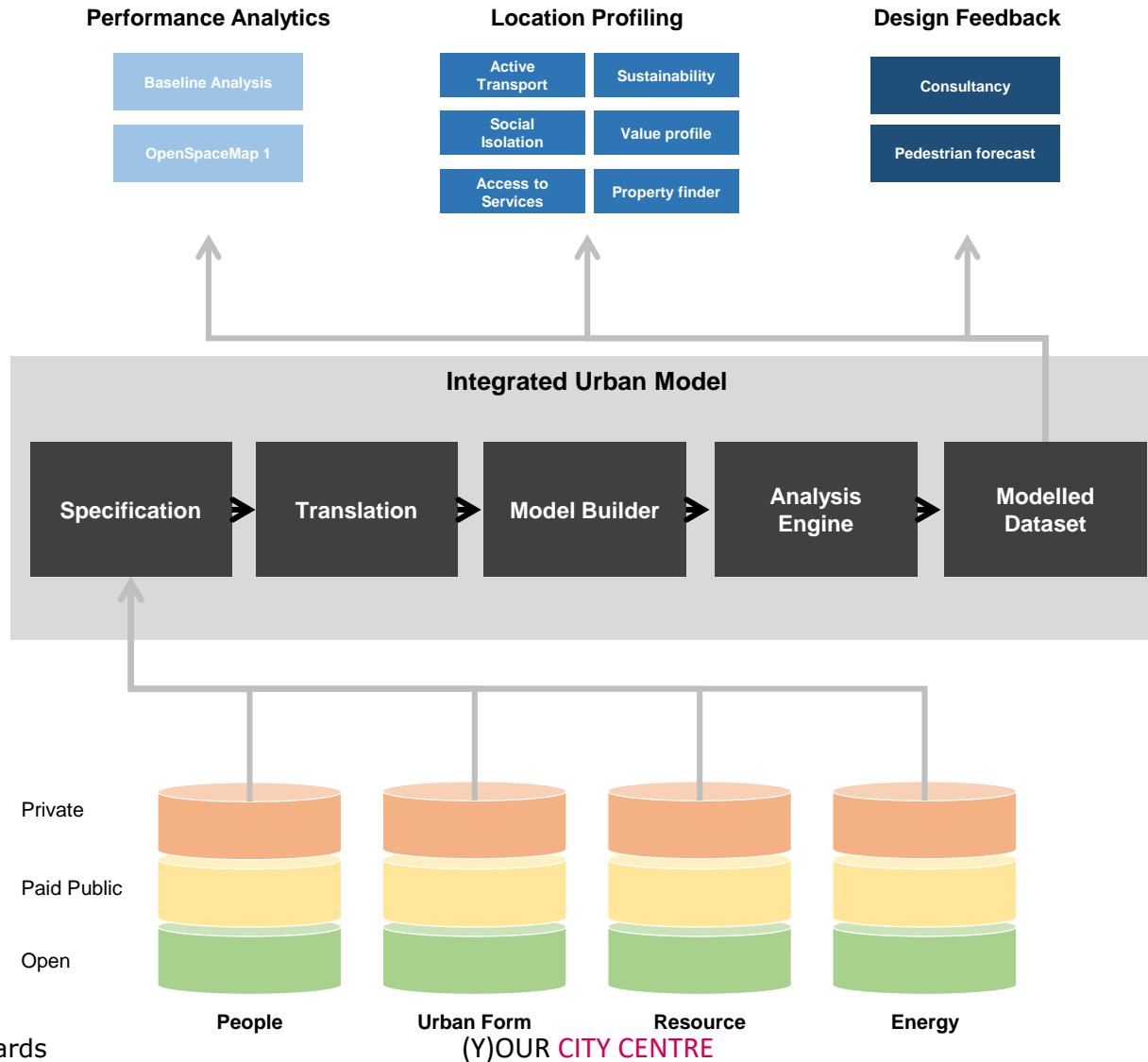
Framework to link datasets

**A standard for city data
and modelling?**



Spatial network as Infrastructure (2)

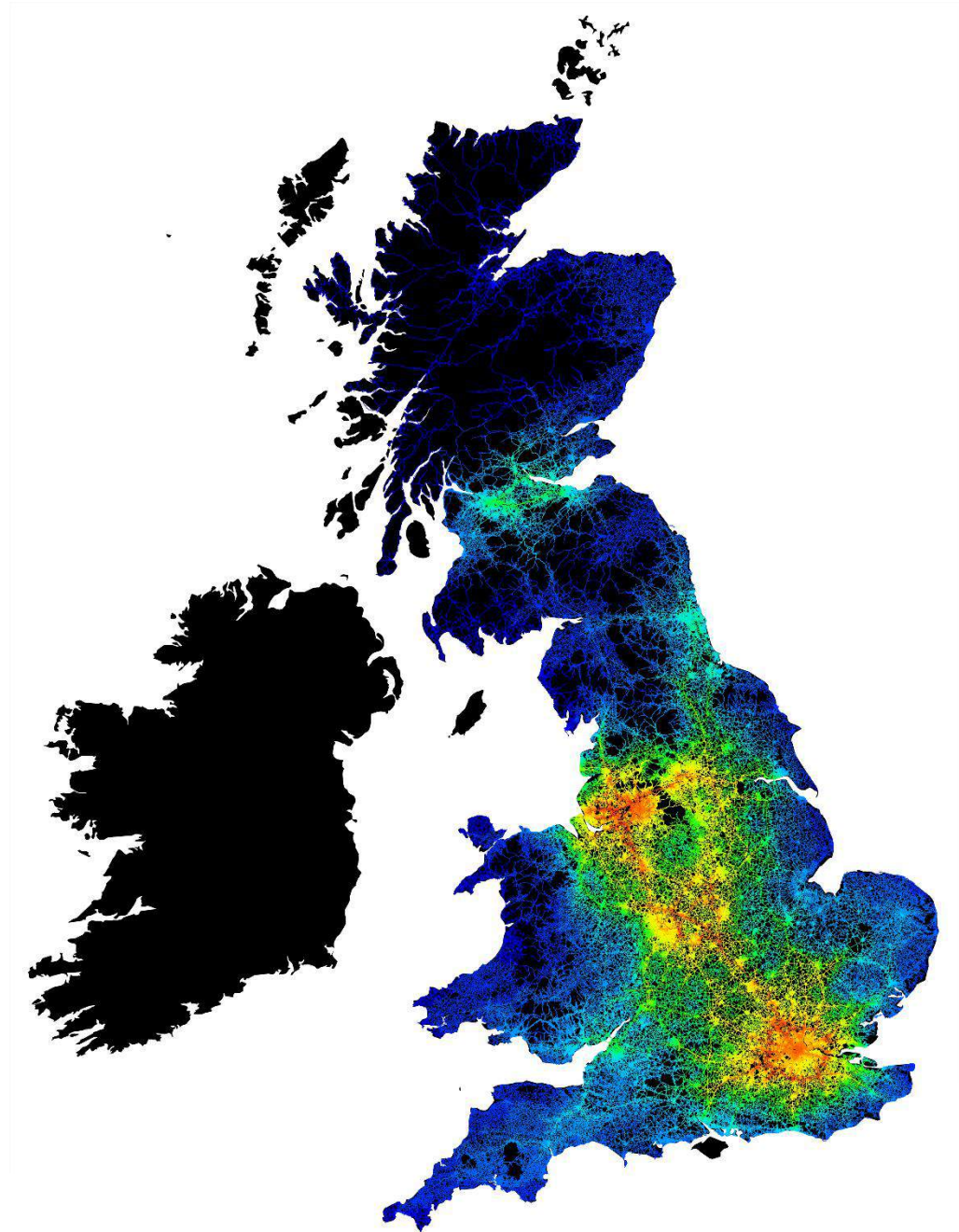
Framework to link datasets



New opportunities

Improvements in processing and availability of datasets allow large scale modelling and analysis to be carried out rapidly

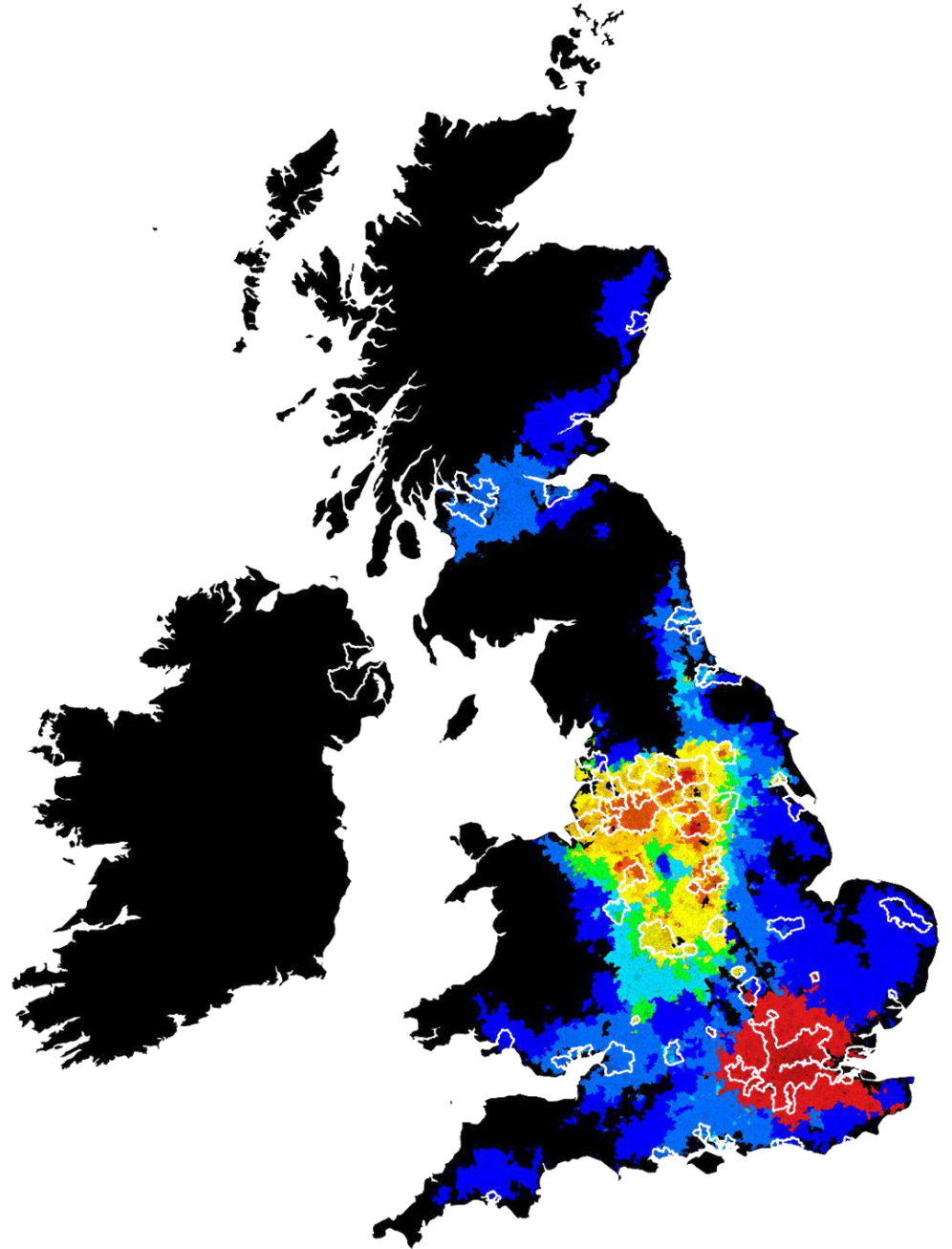
This allows modelling activity to move away from a bespoke service to something which can be pre-processed and queried



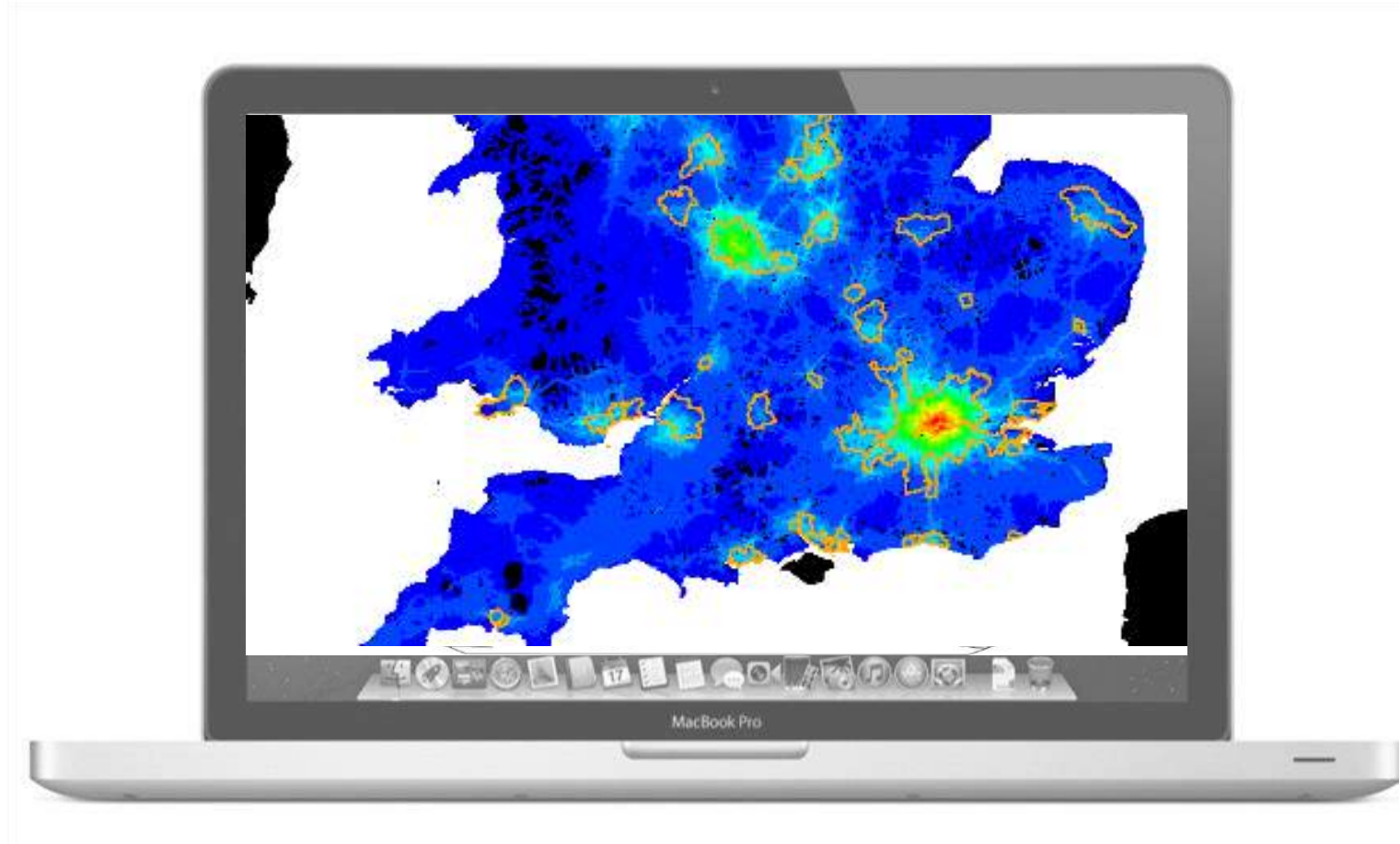
New opportunities

Improvements in processing and availability of datasets allow large scale modelling and analysis to be carried out rapidly

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Performance Analytics Policy + Planning

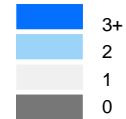


Sharing data to facilitate longitudinal research and better decision making

Location Profiling Operation + Management



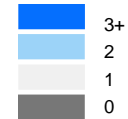
Stations within 15 minutes
walk



Location Profiling Operation + Management



Stations within 15 minutes walk



Urban Character



Vacant



Footplate size

Rental cost

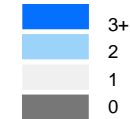
Similar companies

...

Location Profiling Operation + Management



Stations within 15 minutes walk



Urban Character



Open data

Private data

Vacant



Footplate size

Rental cost

Similar companies

...

Location Profiling Operation + Management



Slow	Medium	Fast
Demographics Land Use Public Transport Spatial Network ...	GP data School data ...	Social Media Transport API ...
		Open data
		Private data
Utilities networks ...	Transactions Tenants Owners ...	Space use Energy use ...

(Y)OUR CITY CENTRE



(Y)our St Georges Cross

(Y)our re-established connections

(Y)our extended aviation

(Y)our repaired highway scar

(Y)our smart play & ride system

Cowcaddens

(Y)our updated mobility

(Y)our green rooftop

(Y)our downgraded junction

(Y)our better connected bus station

(Y)our updated pedestrian network

(Y)our new offices

(Y)our better connected bus station

Buchanan Bus Station

(Y)our reduced amount of cars

(Y)our re-established connections

(Y)our attractive public spaces

(Y)our vibrant city centre

(Y)our reconstructed high street

(Y)our new Aberdeen Cross

(Y)our restored grid

(Y)our improved cycle net

(Y)our plot links

(Y)our reconstructed high street

Anderston

(Y)our city parking garages

Glasgow Central

(Y)our optimized car circulation

(Y)our well-connected citylike system

High Street

(Y)our High Street Station

(Y)our Greenfield quarter

(Y)our city plot links

(Y)our new restaurant

(Y)our new houses

(Y)our city boulevard

St Enoch

Argyle St

(Y)our central river

(Y)our new event place

(Y)our upgraded promenade

(Y)our upgraded promenade

(Y)our Southside quarter

(Y)our Southside quarter

(Y)our improved play & ride system

Bridge St

(Y)our temporary projects and events

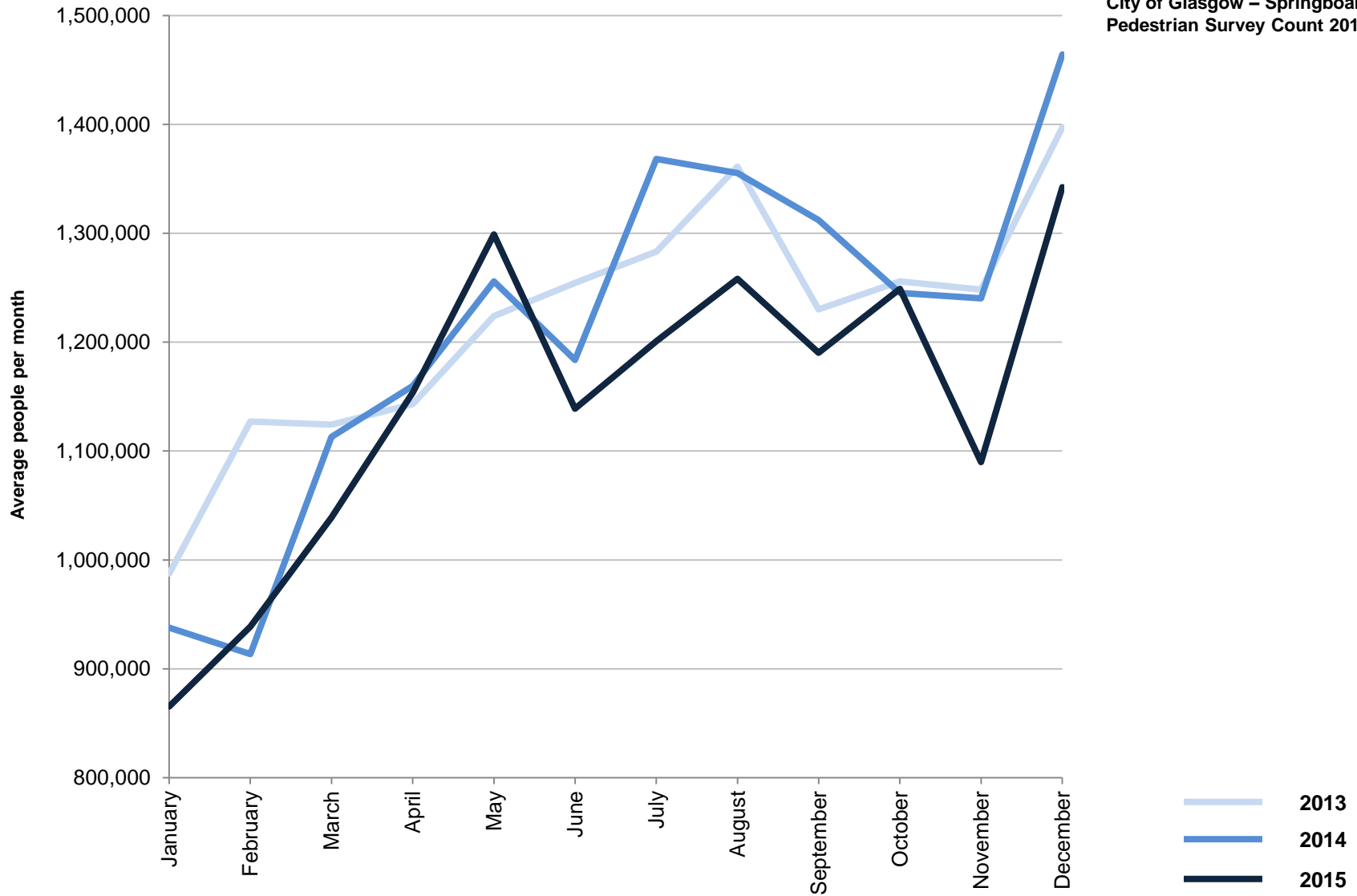
(Y)our accessible river

Shields Road

West St

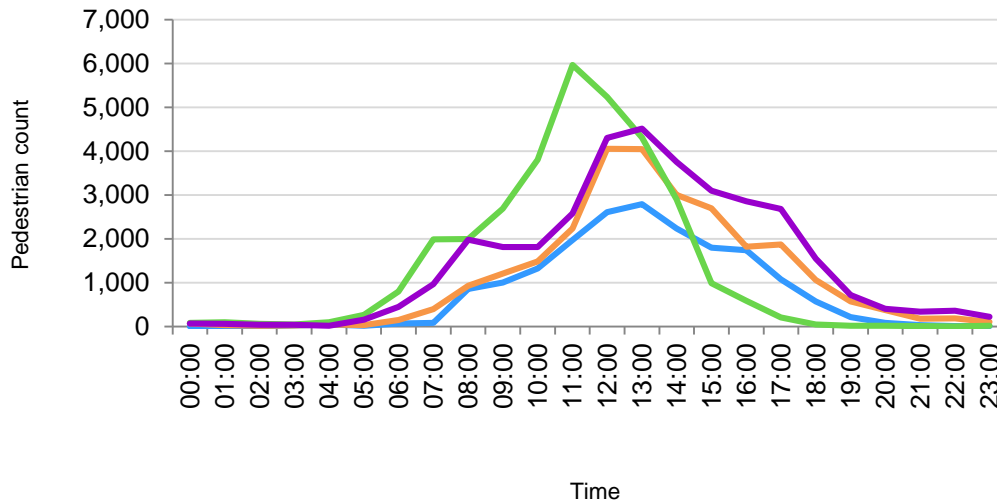
Movement patterns **Pedestrian** **Seasonal**

City of Glasgow – Springboard
Pedestrian Survey Count 2016

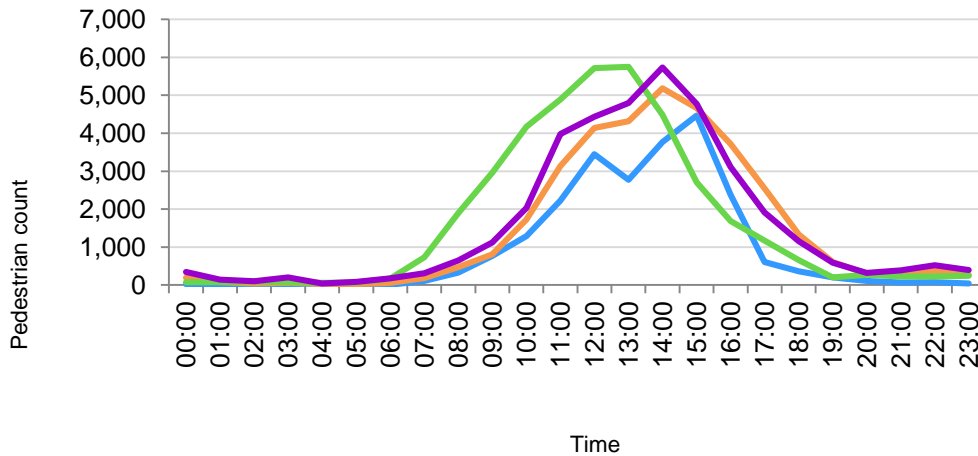


Movement patterns **Pedestrian** Weekday and weekend

Weekday



Weekend

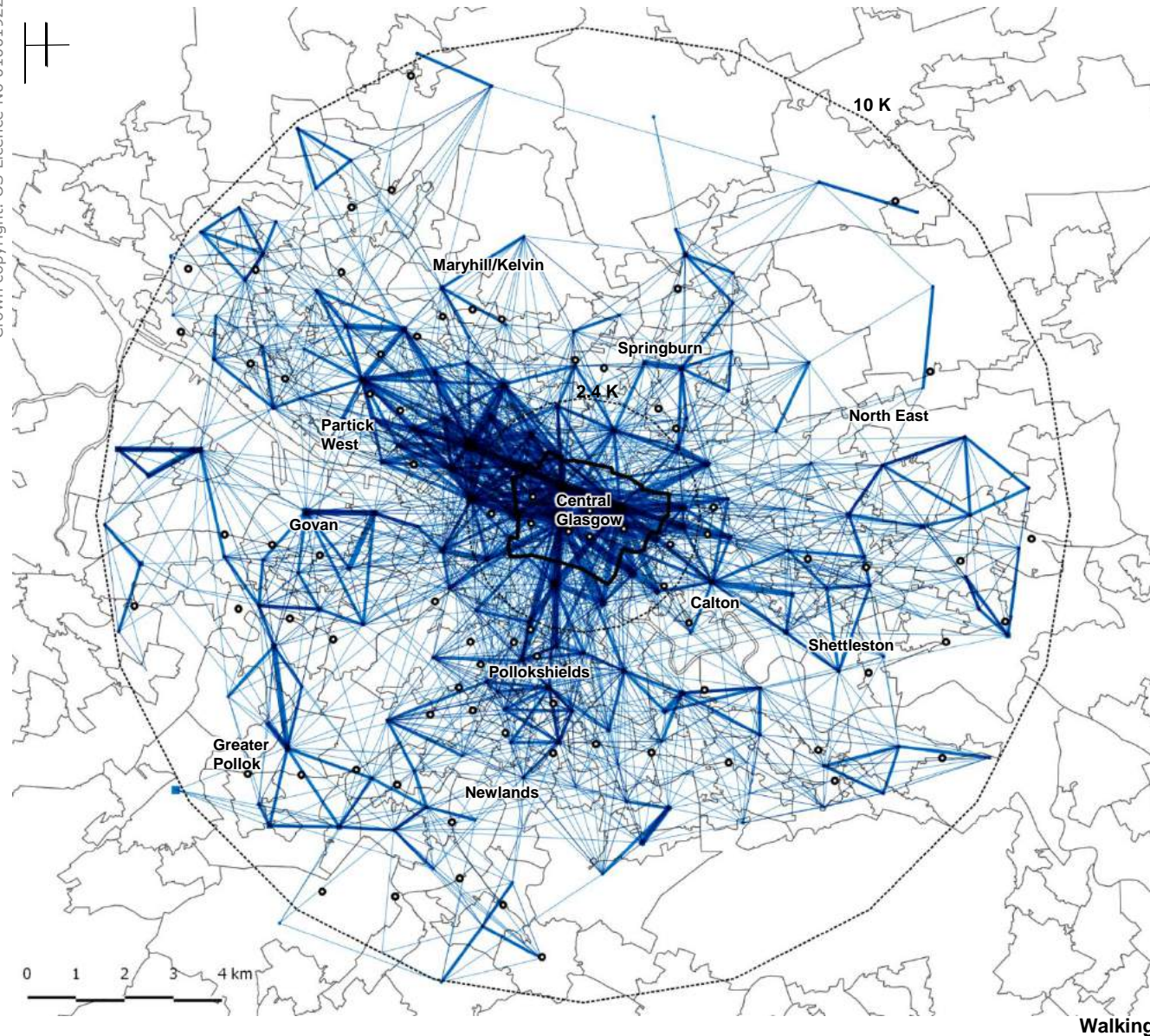


City of Glasgow – Springboard
Pedestrian Survey Count 2016



- **Buchanan Street**
- **Buchanan Street Lush**
- **Sauchiehall Street**
- **Argyle Street Debenhams**

Glasgow Commuting patterns **Walking** 10k radius



Census Data 2011

Intermediate zone boundary

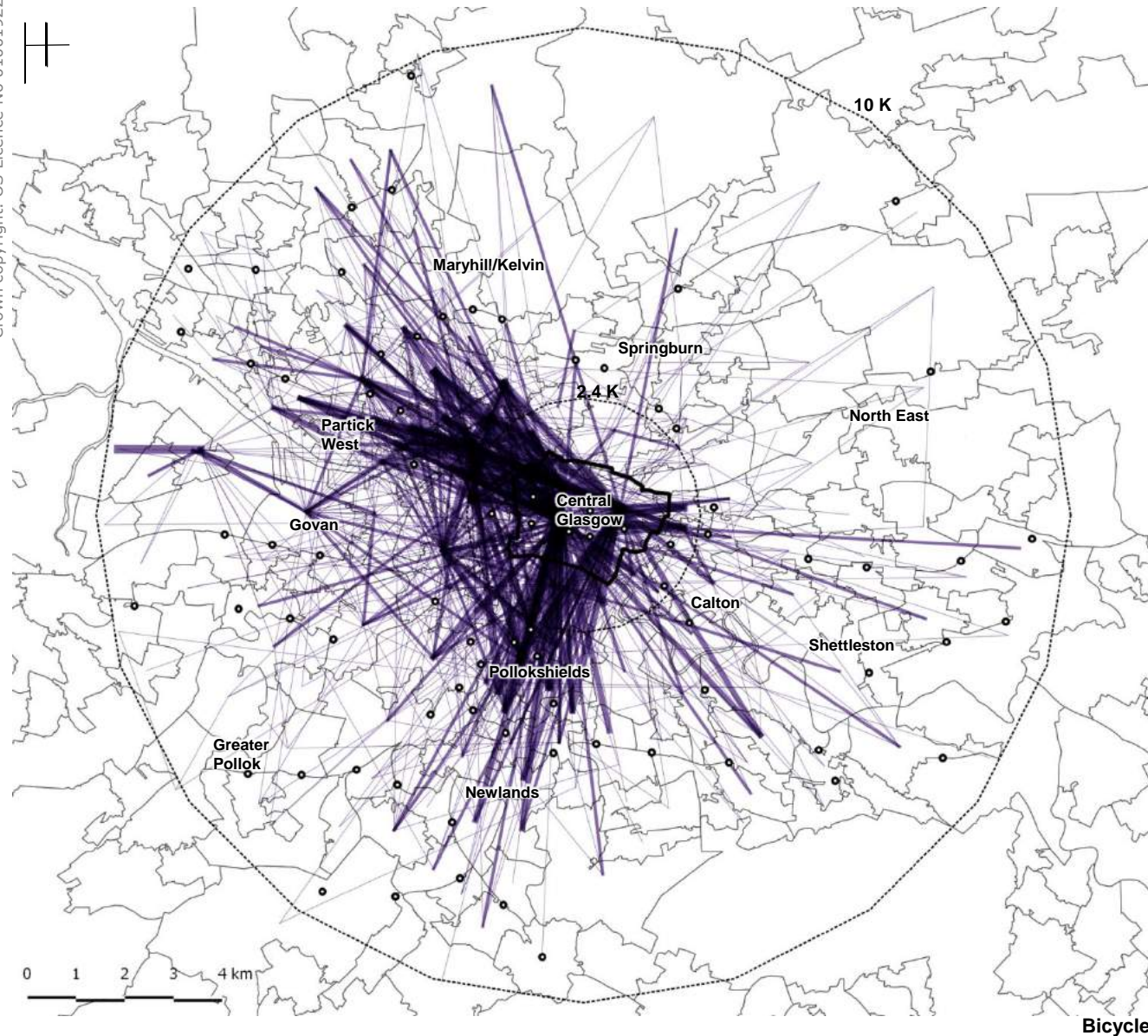
36,768 people
↔

[2.4 K = 30 min walking]

Commuting Pattern
within Glasgow City

Walking

Glasgow Commuting patterns **Bicycle** 10k radius



Census Data 2011

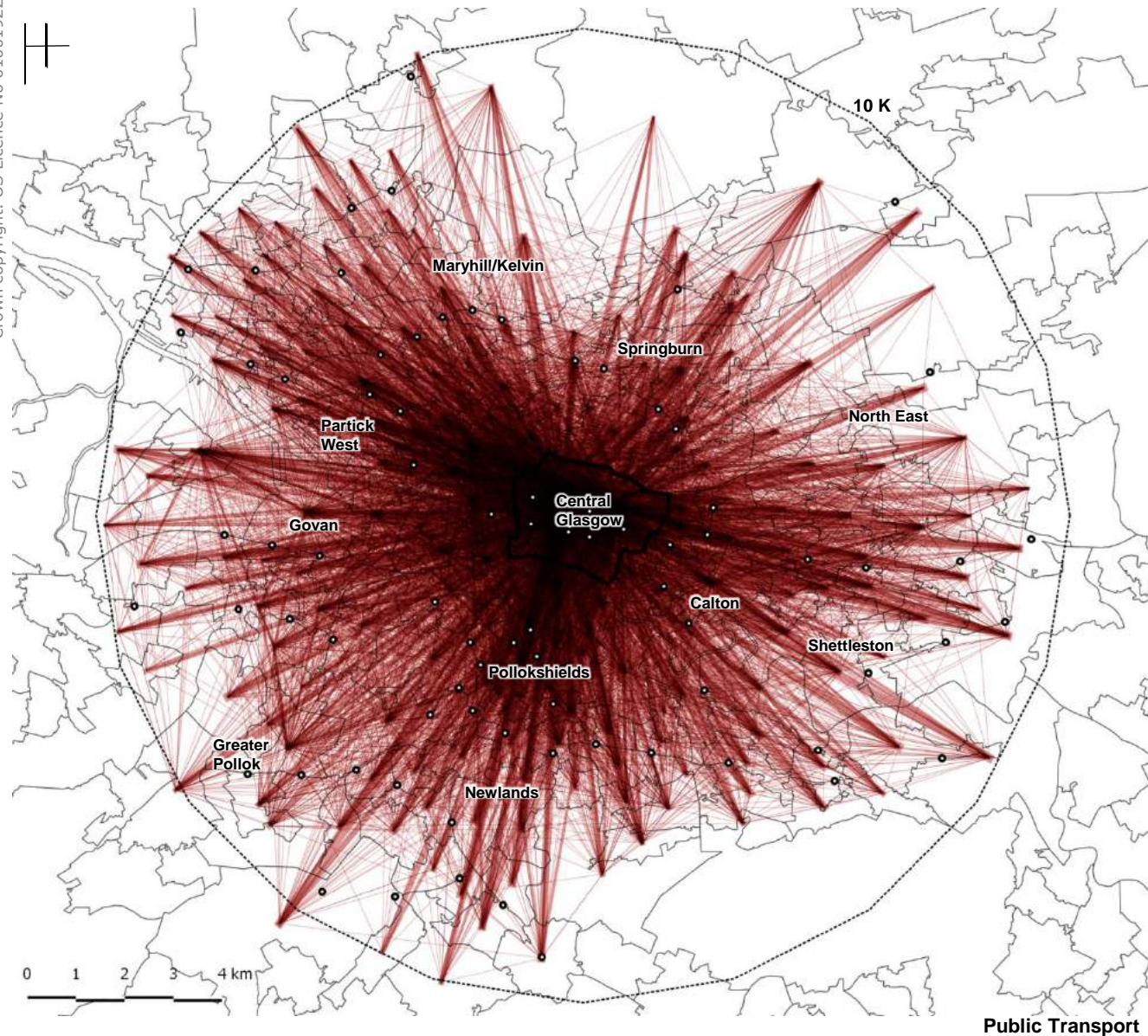
Intermediate zone boundary

4,672 people
↔

— Commuting Pattern
within Glasgow City

Bicycle

Glasgow Commuting patterns Public transport 10k radius



Census Data 2011

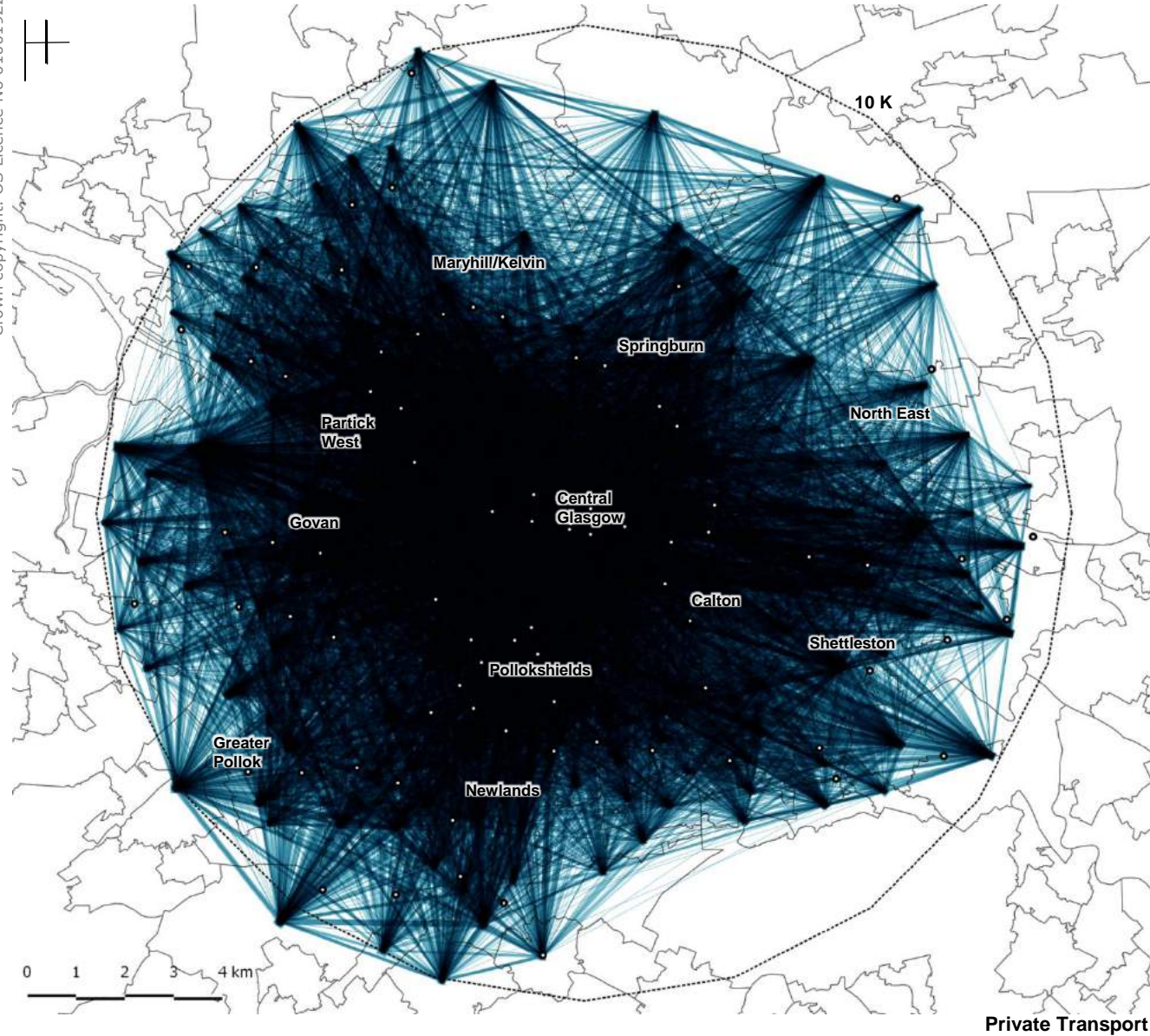
Intermediate zone boundary

78,671 people
↔

— Commuting Pattern within Glasgow City

Public Transport

Glasgow Commuting patterns Private transport 10k radius



Census Data 2011

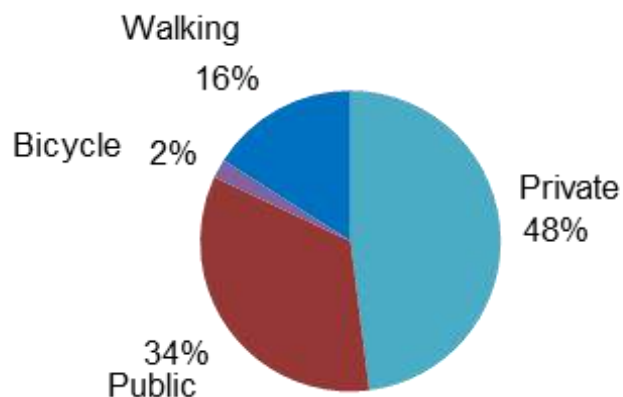
Intermediate zone boundary

112,337 people
↔

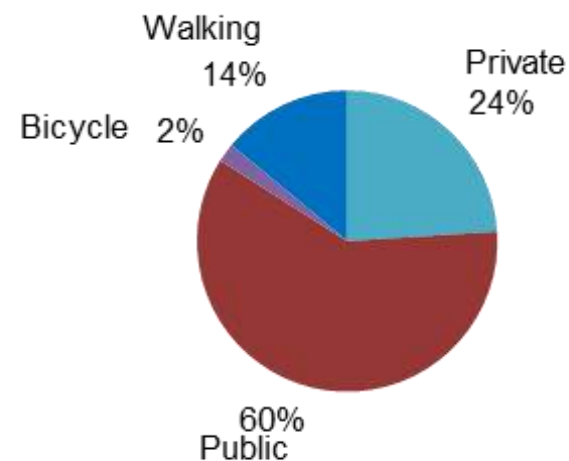
Commuting Pattern within Glasgow City

Private Transport

Within City Centre



To and from City Centre (10k)



Census Data 2011

Intermediate zone boundary

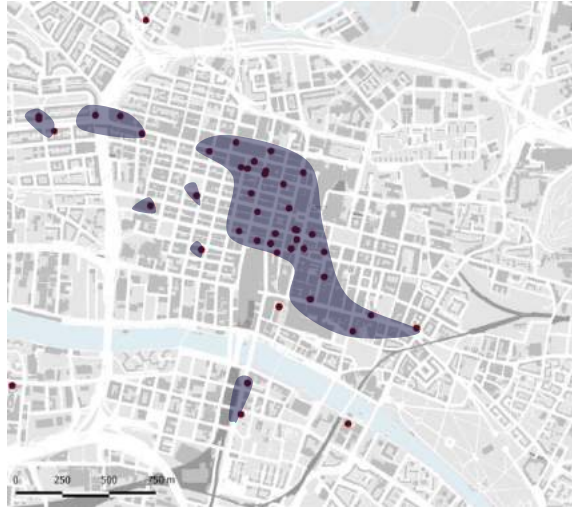
Location of usual residence and place of work by method of transport.

Urban function Land use

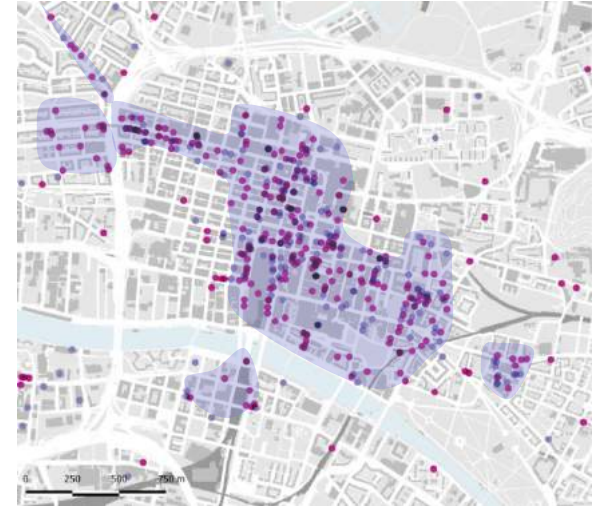
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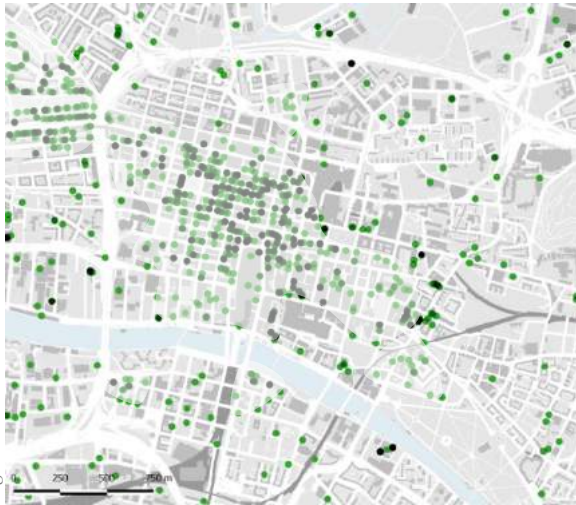
Shops (Class 1)



Financial Services (Class 2)



Food and Drink (Class 3)



Business (Class 4)



Hotels and Hostels (Class 7)

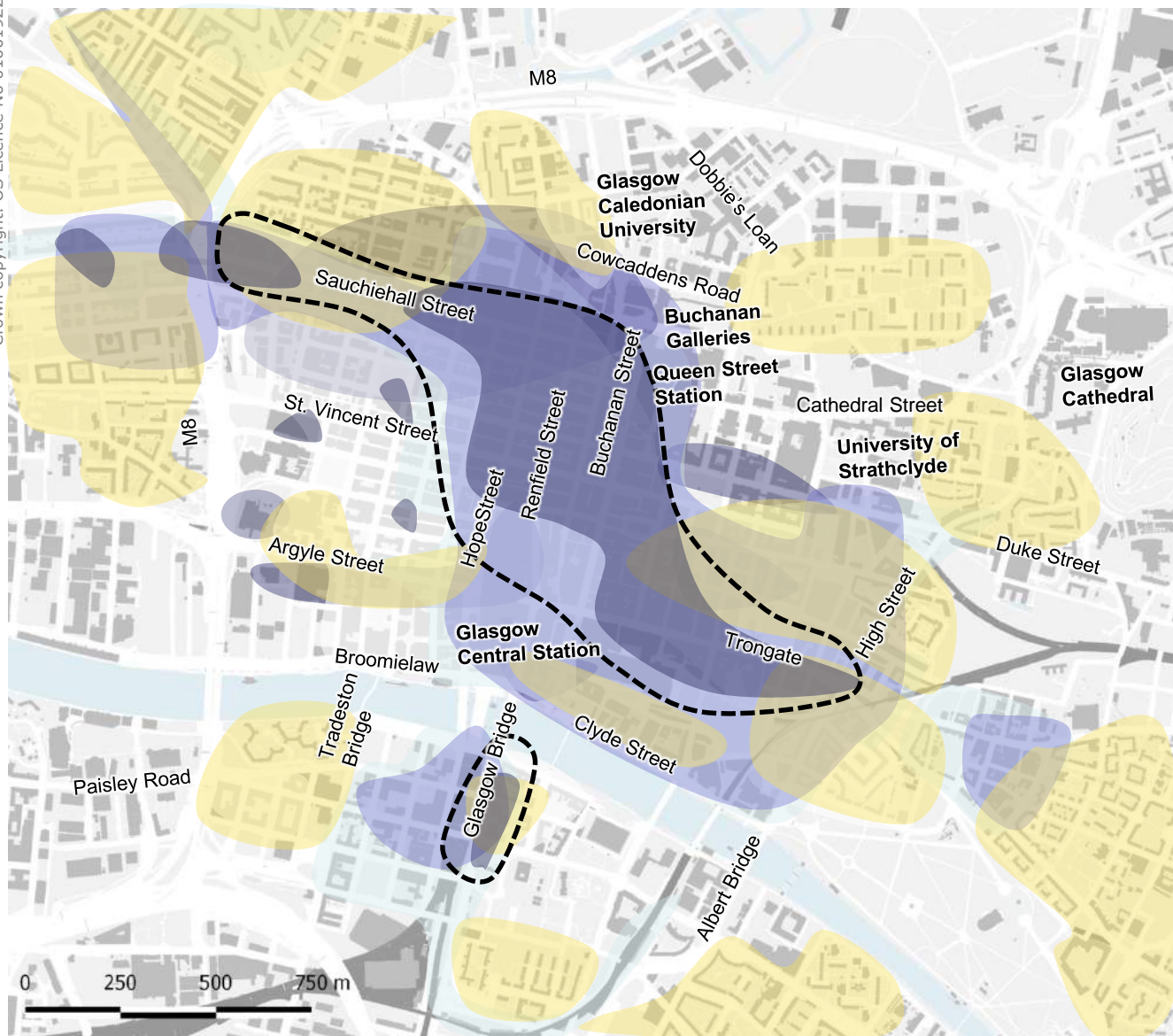


Residential Institutions and Houses (Classes 8 and 9)

<http://www.gov.scot/Publications/1998/01/circular-1-1998-roof/circular-1-1998-intro>

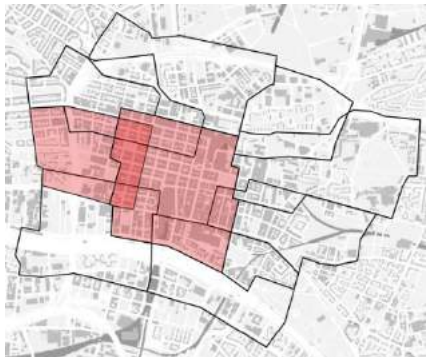
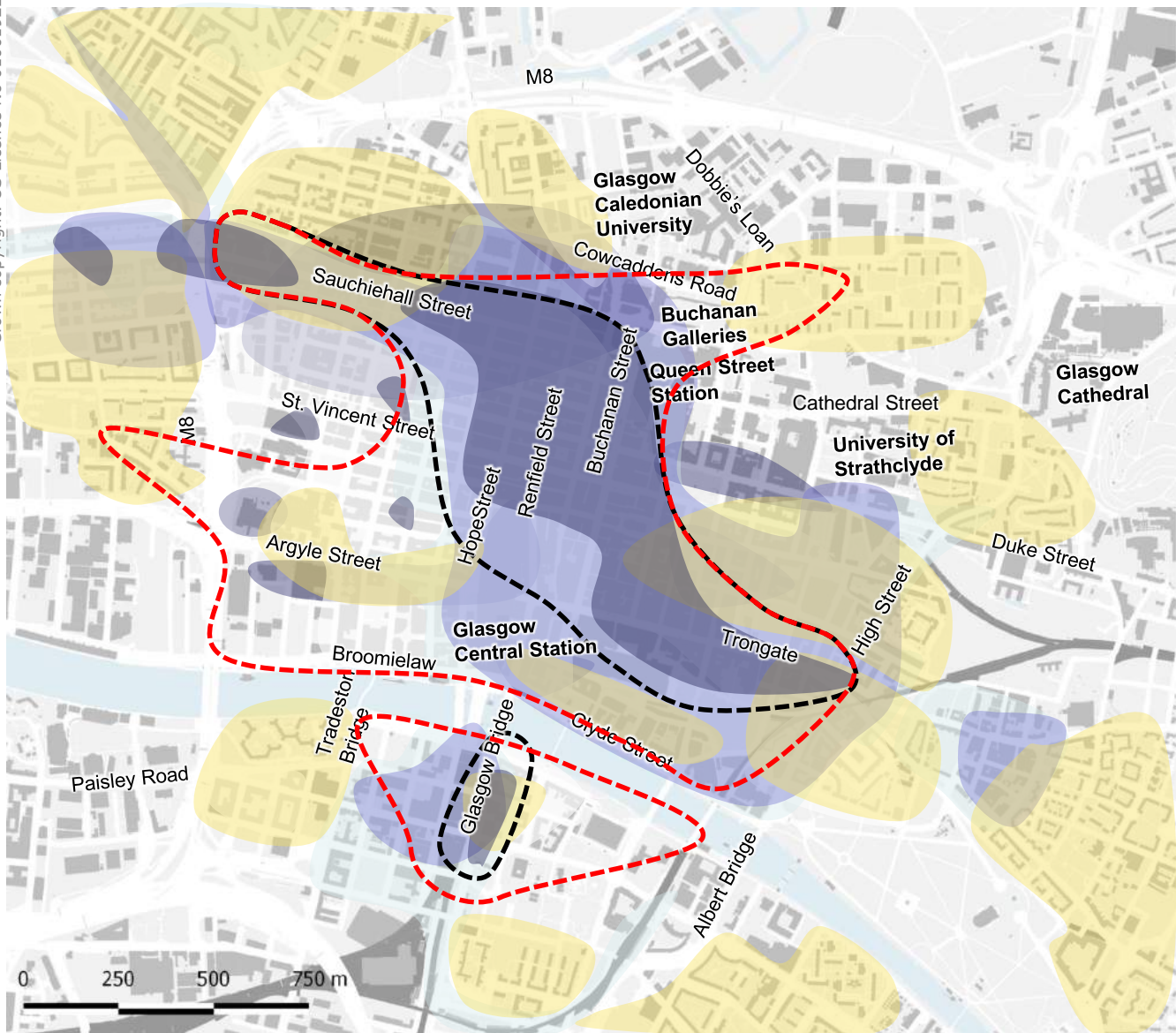
Urban function Land use

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- High density of land use area
- Shops
- Financial Services
- Food and Drink
- Business
- Hotels and Hostels
- Residential Institutions and Houses

Urban function Land use



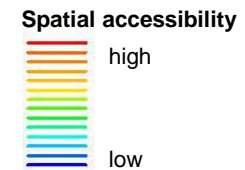
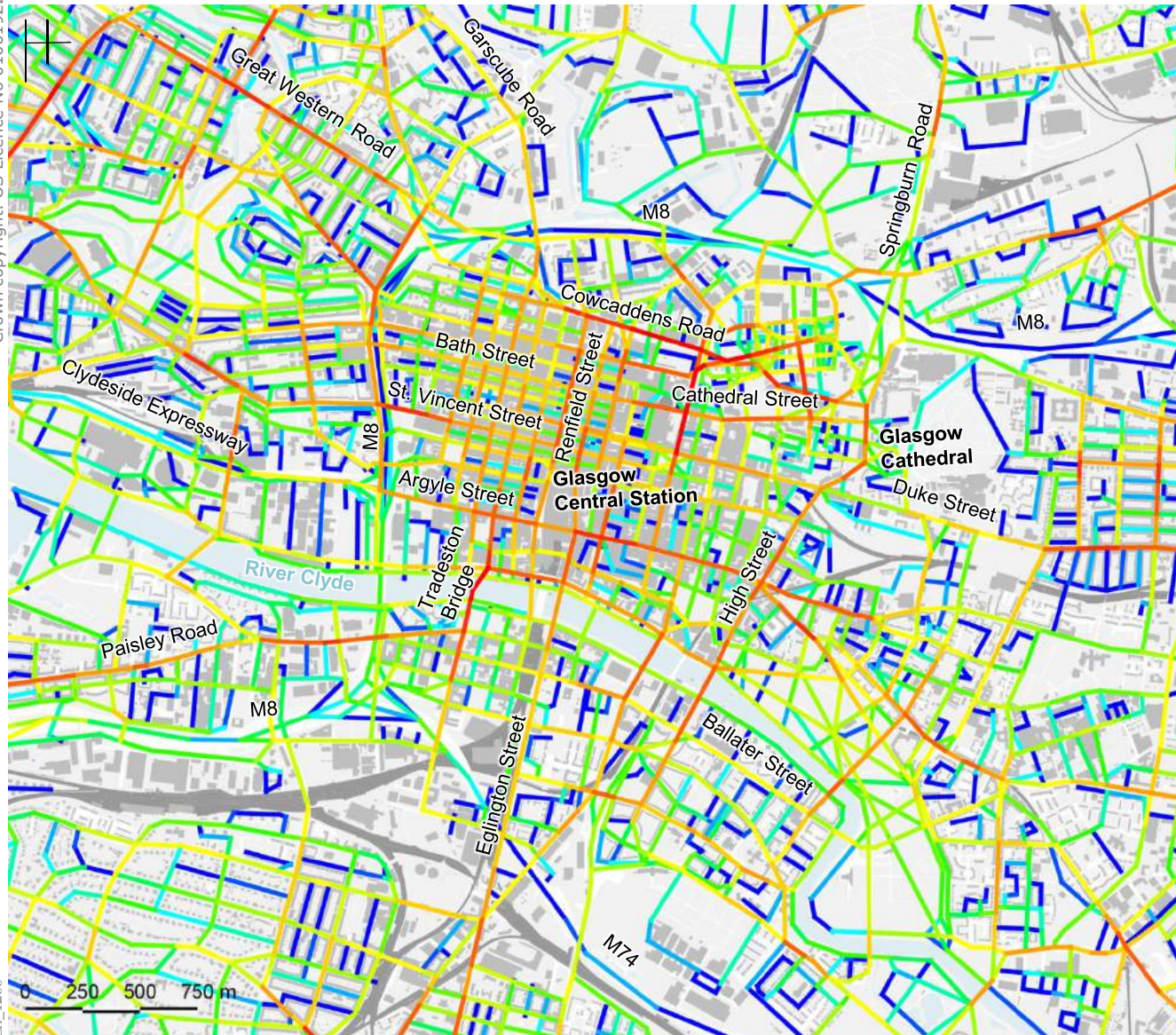
— Blythswood and Central districts

- High density of land use area
- Shops
- Financial Services
- Food and Drink
- Business
- Hotels and Hostels
- Residential Institutions and Houses

Spatial accessibility Urban character

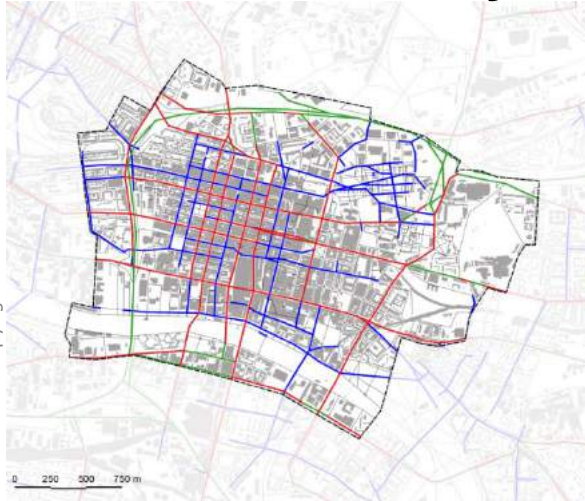
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NACH_1200

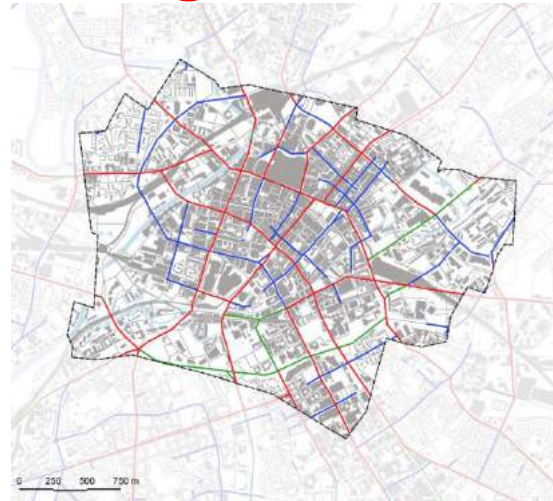


Multi-scale analysis **Glasgow Manchester Edinburgh**

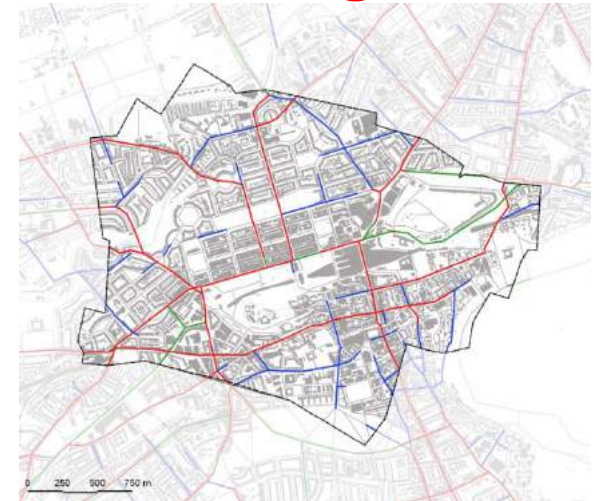
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Glasgow



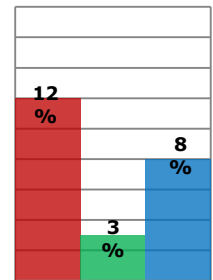
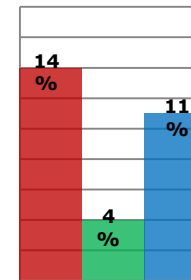
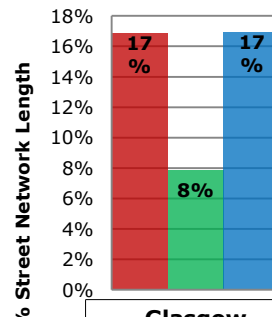
Manchester



Edinburgh

**Highly accessible routes
values above 1.2 :**

■ Local and Global
■ Global
■ Local



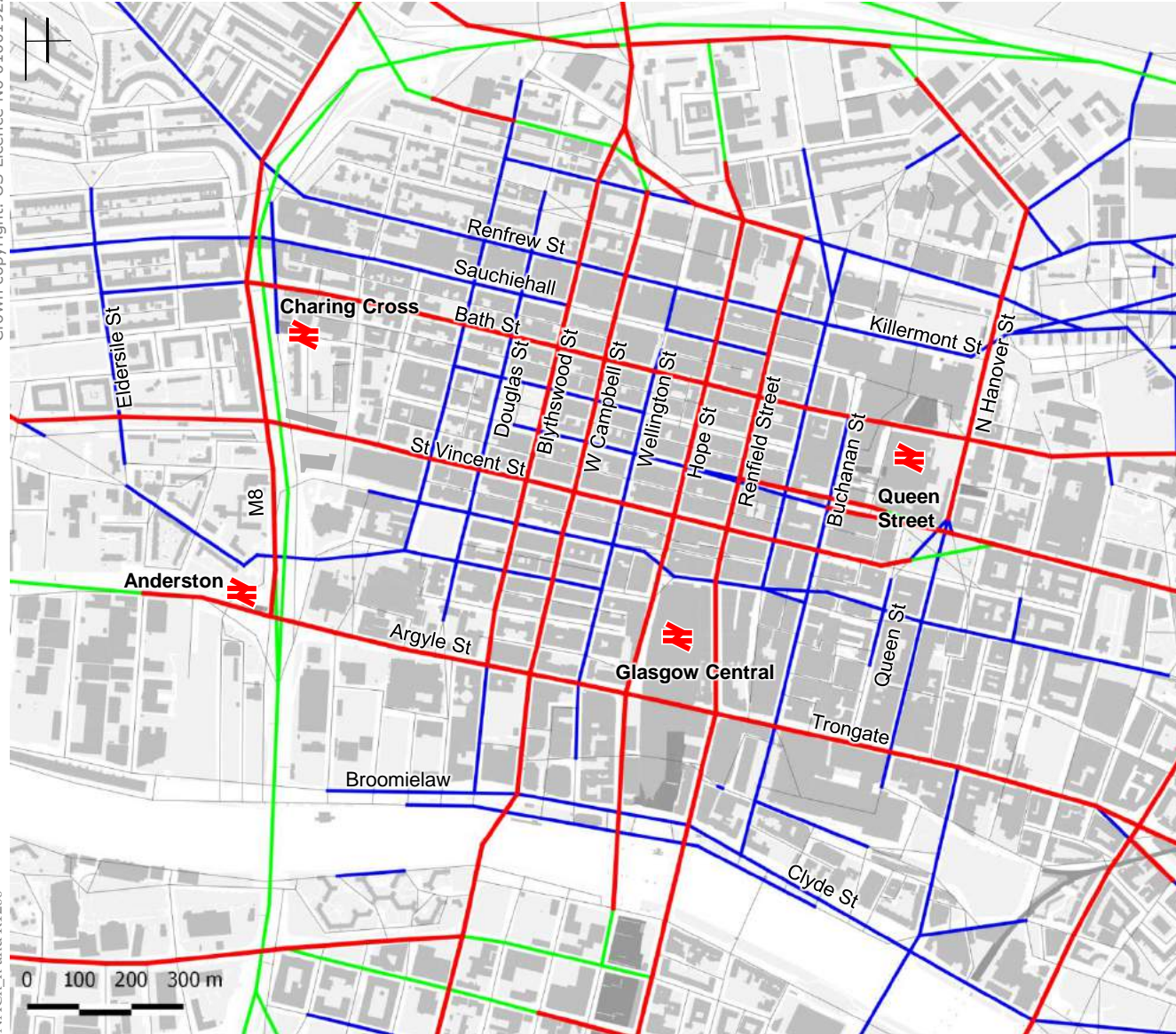
Glasgow City Centre's Area Comparison:	Glasgow	Manchester	Edinburgh
*Population	32,618	43,546	37,413
*Density	5,824 /sqk	7,776 /sqk	6,680/sqk
**Total Street network Length	130,132 m	119,519 m	118,234 m
*Street network length per person [mpp]***	3,98	3,19	2,71
*Highly Accessible Local and Global routes per person [mpp]***	0.67	0.39	0.37

* Census 2011 Population by Data Zones intersected by Glasgow City Centre district boundary. ** Street network Length inside Glasgow City Centre district boundary. ***meters per person.

Multi-scale analysis Existing

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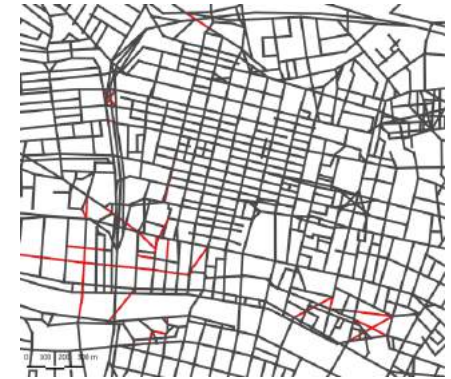
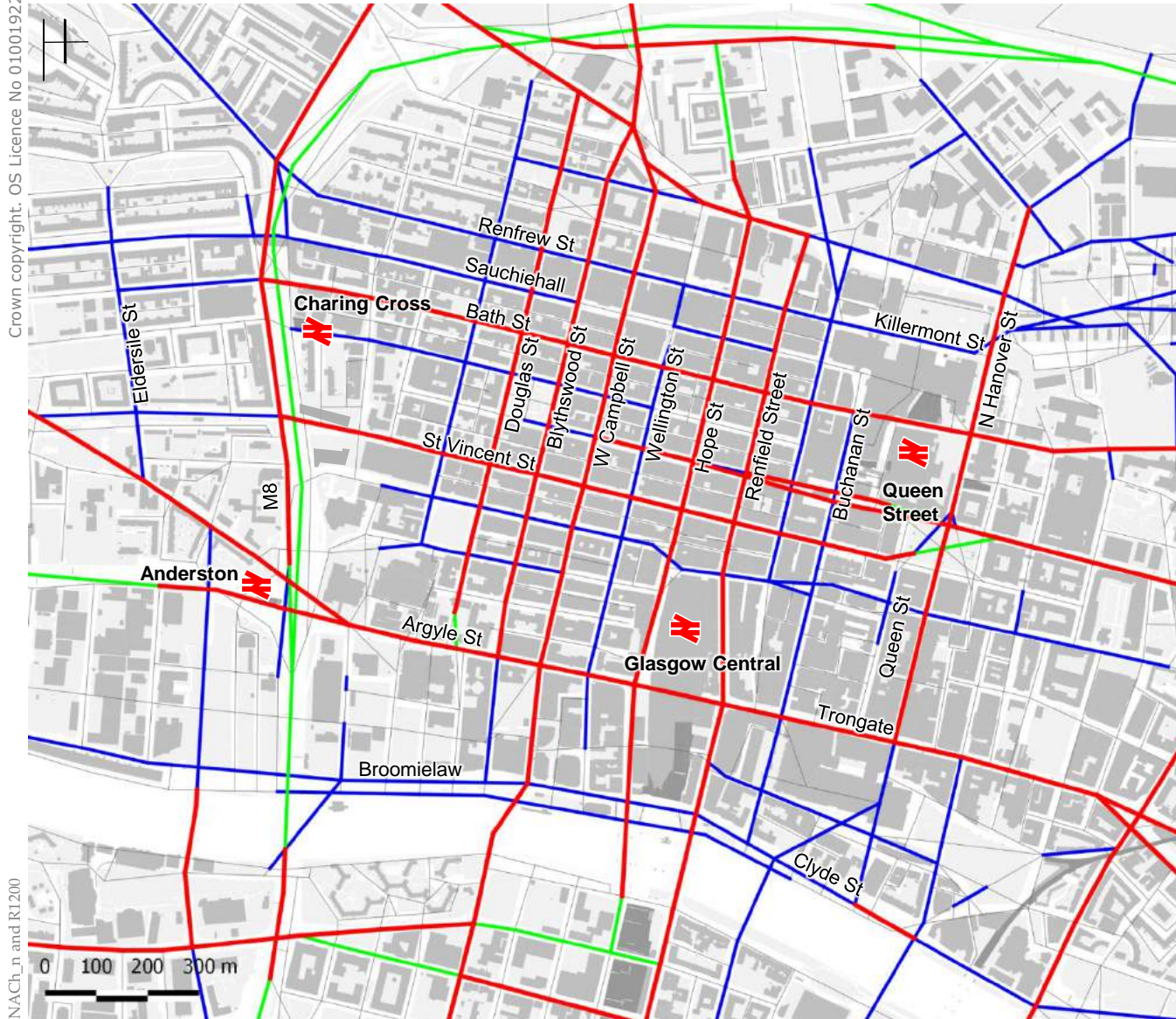
NACH_n and RI200



Highly accessible routes
values above 1.2 :

- Local
- Global
- Local and Global
- Road Network < 1.2

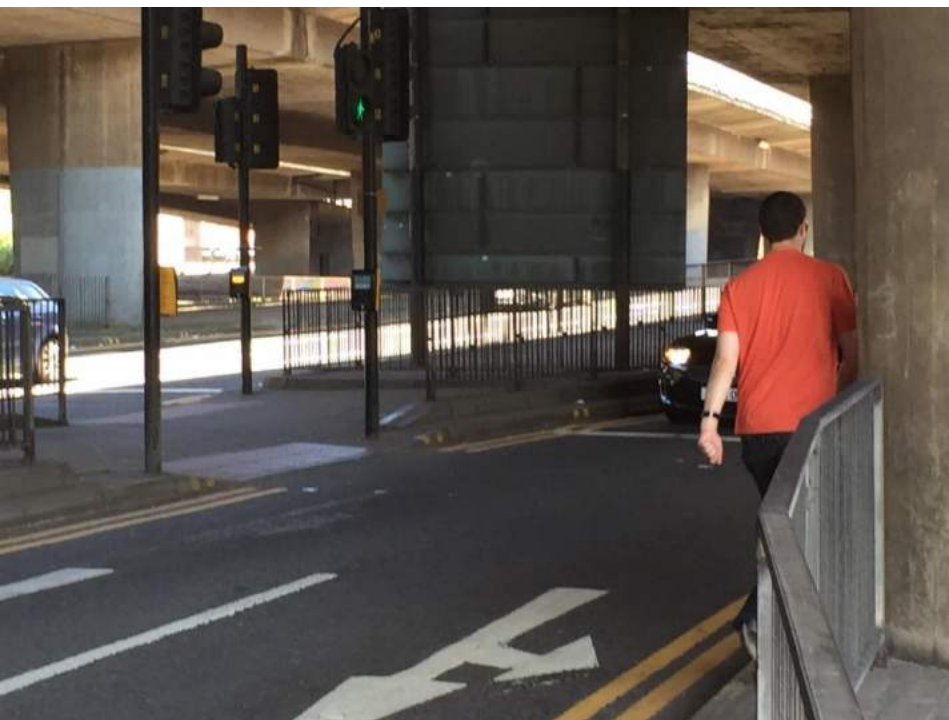
Multi-scale analysis Existing + Cumulative



Existing
Sauchiehall, Broomielaw and St.Enoch actions

Highly accessible routes
values above 1.2 :

Local
Global
Local and Global
Road Network < 1.2







St Georges Cross

(Y)our re-established connections

(Y)our extended avenues

(Y)our repaired highway scar

(Y)our smart park&ride system

(Y)our updated mobility

(Y)our green rooftop

(Y)our downgraded junction

(Y)our repaired highway scar

Charing Cross

(Y)our new offices

(Y)our better connected bus station

Buchanan Bus Station

(Y)our re-established connections

(Y)our re-purposed buildings

(Y)our attractive public spaces

(Y)our vibrant city centre

(Y)our reduced amount of cars

(Y)our reconstructed high street

(Y)our reconstructed High Street

(Y)our New Anderston Cross

Anderston

(Y)our updated cycle net

Queen St

(Y)our plot infill

(Y)our restored grid

(Y)our city parking garages

(Y)our optimized car circulation

(Y)our well-connected citybike system

High Street

(Y)our High Street Station quarter

(Y)our Broomielaw quarter

(Y)our sports plaza

(Y)our new riverfront

(Y)our new lanes

Glasgow Central

(Y)our city boulevard

St Enoch

Argyle St

(Y)our central river

(Y)our new event plaza

(Y)our Bridgegate quarter

(Y)our South promenade

(Y)our upgraded promenade

(Y)our South city centre

(Y)our temporary projects and events

(Y)our accessible river

(Y)our downgraded junction

(Y)our smart park&ride system

Bridge St

Shields Road

West St