

# Urban Big Data Centre

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An ESRC Data Investment



University of Glasgow

A collaboration of:

- Social scientists
- Statisticians
- Computer scientists
- Engineers



An ESRC Data  
Investment

## A national data service for research on UK cities and urban challenges

- Promoting the use of innovative methods and complex urban data to address social and environmental challenges facing cities
- **Strategic Themes:** dynamic resource management; social inclusion; lifelong learning; economic and business innovations; citizen engagement and citizen science, planning and policy reform
- **Multiple Urban Sectors:** transport, housing, education, economic development, environment, energy

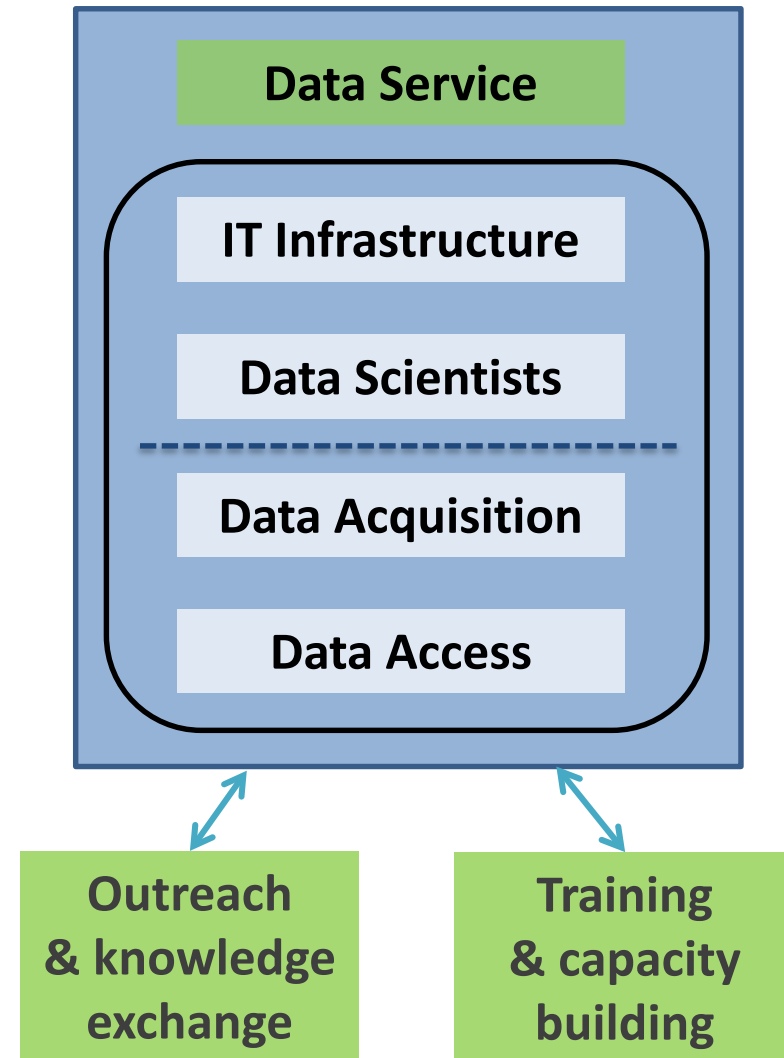
## Big Data =

### *Naturally-occurring data*

not (usually) collected for research purposes

- Urban sensors – traffic, CCTV, environmental ...
- Remote sensors – satellite, LiDAR ...
- Business systems – transactions, logistics, ...
- Administrative systems – tax, benefits, health, education ...
- User-generated – web use, mobile phones, social media, apps ...
- ...

- Data sourcing proactive and responsive
  - Open data
  - Safeguarded data
  - Controlled data
- User support
  - Data documentation, validation
  - Analytical support and advice
- **Free** to researchers
  - Academics, public bodies, private sector, voluntary groups ...
  - Independent committee approves projects where new resources involved



## Example 1: Strava Metro – app data on cycling and running

- Volunteered geospatial data from app for 2012-15
- Anonymised point data not journeys
- Scottish data licensed to UBDC for non-commercial research



## Example 2: Spatial Urban Data System (SUDS)

- Synthetic small-area data on UK's largest cities
- **Inputs:** census, surveys, sensors, social media, specialised data programs
- **Processes:** simple processing to complex urban models and simulations
- **Outputs:** Simple to complex indicators describing cities and communities (eg, transport accessibility, PM<sub>2.5</sub> emissions, fuel poverty, walkability etc)
- **Access:** Open-source GIS technology, linked to development tools and online visualisation and analytics



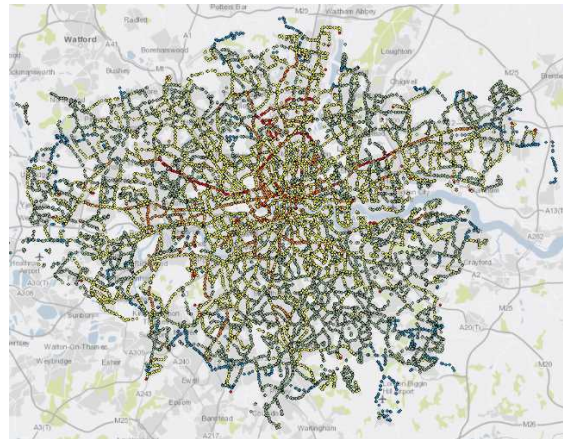
## Example SUDS indicator: Access to jobs by public transport

Based on transit performance data for every train, bus and ferry stop

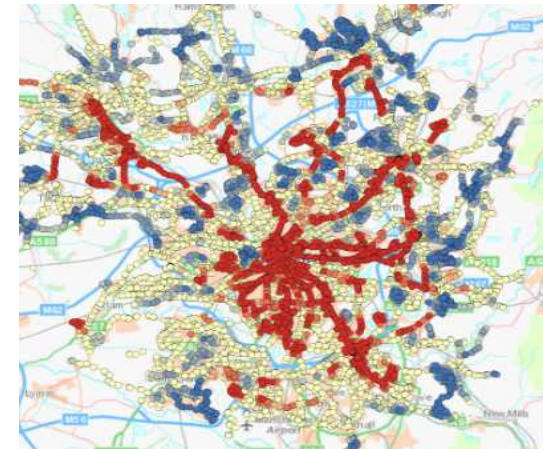
Transit GTFS data



Transit Availability Index  
– London Bus Stops



Transit Availability Index  
– Manchester Bus Stops



## Example 3: integrated Multimedia City Database (iMCD)

### Multi-strand data platform for Glasgow

- **Primary survey** - 1500 households in Greater Glasgow (2600 persons)
  - Questionnaire-based survey
  - Sensing survey (GPS and lifelogging use by participants)
- **Information Retrieval** (text-based media and multimedia data)
- **Remote Sensing:** Very High Resolution satellite data and LiDAR data to construct dynamic Digital Surface Model of Glasgow
- **Sensor networks:** transportation, emissions, weather, lighting systems





## Training and Capacity-Building

### Training Programme

- Using the data service
- Basic methods courses
- Advanced methods courses

### Teaching programme

- MSc in Urban Transport

### Workshops, webinars

### ***Social Analytics Strategic Network*** (SASNet – with Essex)

- Includes Visiting Fellowships



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