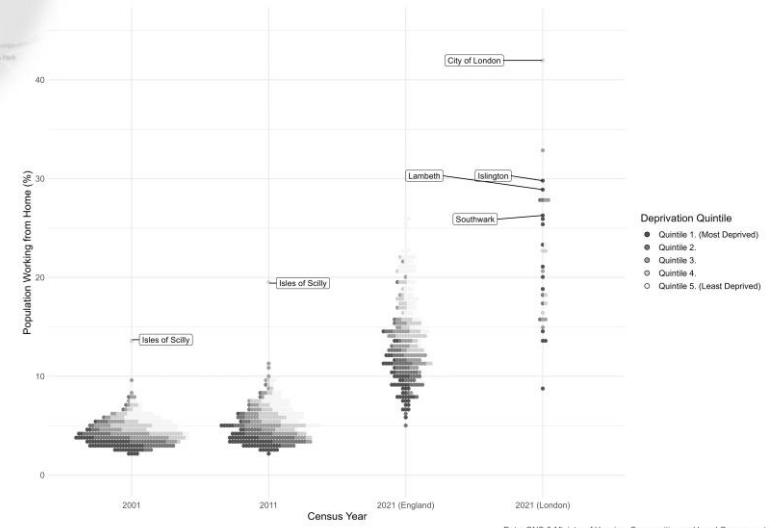
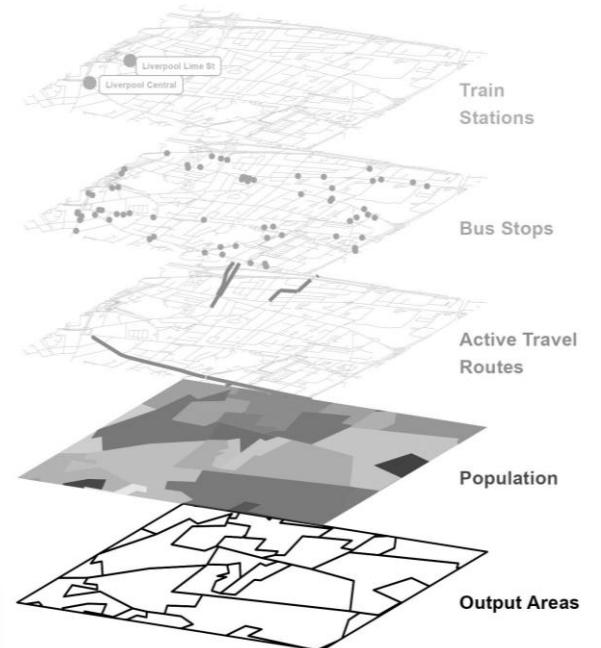


We need more spatial thinkers!

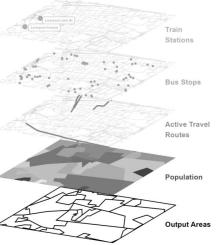
Perspectives from a Postdoctoral Researcher

Dr. Patrick Ballantyne

Geographic Data Science Lab, University of Liverpool



Today's Talk

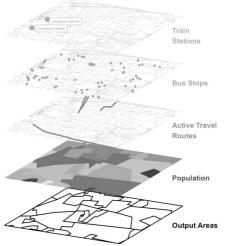


- »»» How did I get here?
- »»» Postdoctoral Researcher? Data Scientist?
- »»» Establishing A Research (Impact) Profile
- »»» Opportunities & Reflections

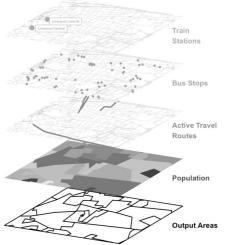
Today's Talk



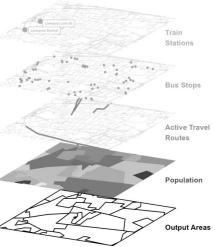
How did I get here?



How did I get here?

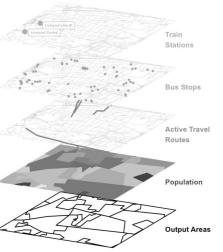


How did I get here?



- 2015 – 2018: BSc Physical Geography
- 2018 – 2022: MSc/PhD Data Analytics & Society
- 2022 – 2023: Postdoctoral Research Associate

How did I get here? (why I am still here...)



Famous alumni...



Geographic
Data Science
Lab

Dr. Patrick Ballantyne

Geographic Data Science Lab, University of Liverpool

Presentation for 'Applications of GIS', University of Sheffield

How did I get here? (why I am still here...)



Geographic Data Science Lab

A centre of excellence for research and teaching, solving grand human challenges through geographic data science, working at the intersection between data science and geography.

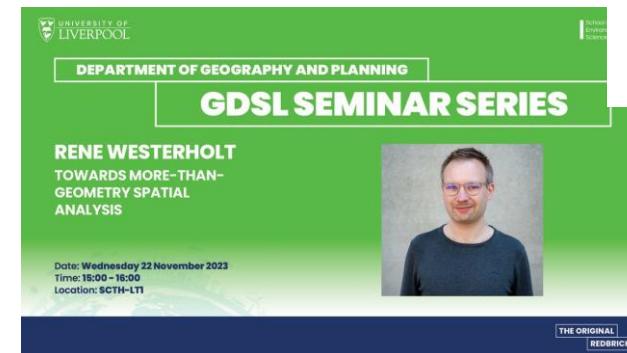


Dr. Patrick Ballantyne

Geographic Data Science Lab, University of Liverpool



GeoDataScience
@geodatascience Follows you
Twitter feed for the Geographic Data Science Lab at the University of Liverpool.
Liverpool geographicdatascience.com Joined January 2014
2,395 Following 6,948 Followers

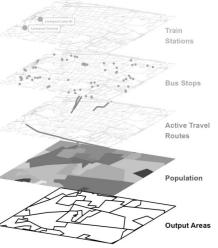


UNIVERSITY OF LIVERPOOL
DEPARTMENT OF GEOGRAPHY AND PLANNING
GDSL SEMINAR SERIES
RENE WESTERHOLT
TOWARDS MORE-THAN-GEOMETRY SPATIAL ANALYSIS
Date: Wednesday 22 November 2023
Time: 15:00 - 16:00
Location: SETH-LTI
THE ORIGINAL REDBRICK



Presentation for 'Applications of GIS', University of Sheffield

Today's Talk



How did I get here?



Postdoctoral Researcher? Data Scientist?

Postdoctoral Research Data Scientist?



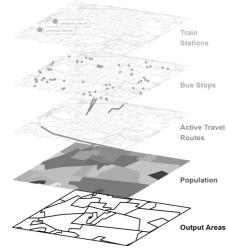
You

What is the role of a postdoctoral data scientist?

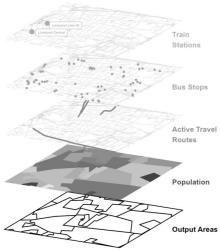


ChatGPT

The role of a postdoctoral data scientist combines the responsibilities of a traditional postdoctoral researcher with a focus on leveraging data science techniques for research and problem-solving.



Postdoctoral Research Data Scientist?



You

What is the role of a postdoctoral data scientist?



ChatGPT

The role of a postdoctoral data scientist combines the responsibilities of a traditional postdoctoral researcher with a focus on leveraging data science techniques for research and problem-solving.



You

what does a postdoctoral researcher do?



ChatGPT

A postdoctoral researcher, often referred to as a postdoc, is an individual who has completed their doctoral (Ph.D.) degree and is engaged in advanced research and scholarly work under the supervision of a principal investigator or mentor. The role of a postdoctoral researcher can vary based on the field of study, the specific research project, and the goals of the research institution,



You

What does a Geographic Data Scientist do?

∅



ChatGPT

A Geographic Data Scientist applies data science techniques and methodologies to analyze and derive insights from spatial or geographic data. This field involves the integration of geography, cartography, statistics, and computer science to solve problems and make decisions related to spatial phenomena. Here are some specific tasks and responsibilities of a Geographic Data Scientist:



Postdoctoral Research Data Scientist?



P

You

What is the role of a postdoctoral data scientist?



ChatGPT

The role of a postdoctoral data scientist combines the responsibilities of a traditional postdoctoral researcher with a focus on leveraging data science techniques for research and problem-solving.



P

You

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P

You

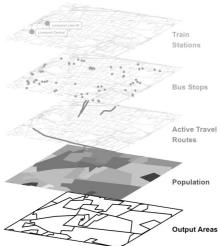
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My job has elements of both being a
POSTDOCTORAL RESEARCHER and a
GEOGRAPHIC DATA SCIENTIST...

... some parts more frequent at certain times and vice versa –
my responsibilities are very context/time sensitive ...

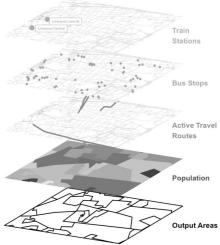
Research Data Scientist



Consumer
Data
Research
Centre



Prof. Alex Singleton



The Consumer Data Research Centre was established to lead academic engagement between industry and the social sciences and utilise consumer data for academic research purposes.

We provide unique insight into a diverse range of societal and economic challenges, in collaboration with a wide range of consumer data providers.

Research Data Scientist

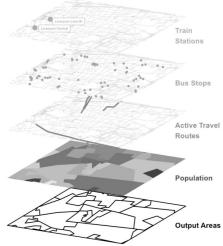


**Consumer
Data
Research
Centre**



Prof. Alex Singleton

- DATA PRODUCT DEVELOPMENT
- APPLICATION DEVELOPMENT
- NEW DATA ACQUISITION
- DATA AND RESEARCH PROMOTION
- RESEARCH PAPERS
- OUTREACH AND ENGAGEMENT

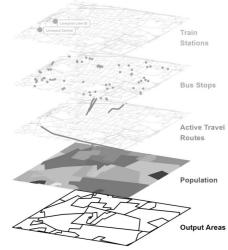


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We provide unique insight into a diverse range of societal and economic challenges, in collaboration with a wide range of consumer data providers.

Research Data Scientist

Developing new data products and applications - WhoLivesHere



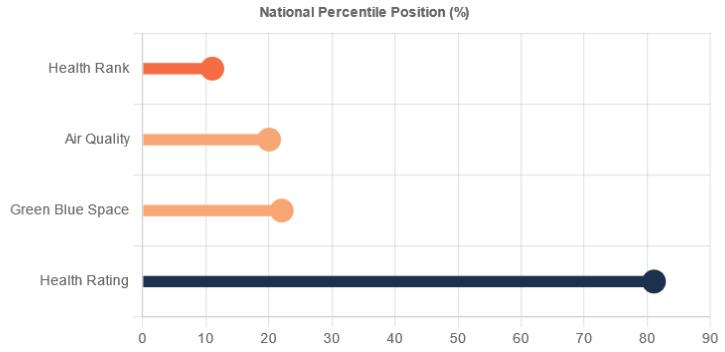
Who Lives Here?

This website helps you to find out more about where you live.

What's your postcode?

Enter postcode Search

mapbox



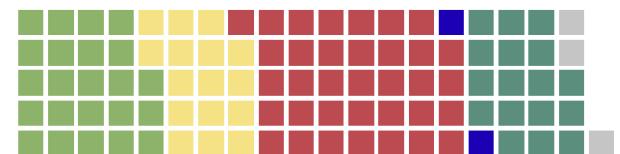
64 % of areas are nearer to a **bus stop** than your postcode. Your nearest bus stop is 0.2 km away.



45 % of areas are nearer to a **train station** than your postcode. Your nearest train station is 1.3 km away.

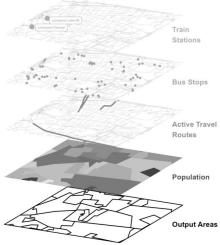
In your area, people travel to work in a variety of ways:

■ Home ■ Tram/tube/metro ■ Bus ■ Car/motorcycle ■ Train ■ Active travel
■ Other



Research Data Scientist

Developing new data products and applications – Access to Cash



```
## Function for building catchments for ATMs - 10 minutes walking distance for each pedestrian
buildATMCatchment <- function(x) {
  iso <- hereR::isoline(x, range = (10 * 60),
                        transport_mode = "pedestrian", range_type = "time")
  iso <- iso %>%
    select(-c(id, rank, departure, arrival, range))
  iso$atmID <- x$atmID
  iso$duration = "10 mins"
  return(iso)
}

## Loop through and parallelise catchment extraction for atms
atm_ls <- split(atm_sf, seq(nrow(atm_sf)))
out2 <- do.call(rbind, lapply(atm_ls, buildATMCatchment))
st_write(out2, "CashCatchments/atm-catchments.gpkg", append = FALSE)
```

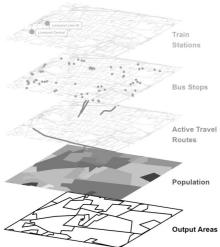


An ESRC Data Investment



Research Data Scientist

New data acquisition



CDRC Datasets Stories Tutorials Topics ▾ Geodata Packs About Data ▾ Log in Register

CDRC Data

The Consumer Data Research Centre is the UK's leading source of consumer data, part of the ESRC's Big Data Programme. We offer data under three tiers: Open, Safeguarded and Secure. Access to Safeguarded/Secure data is through a reviewed application process. Secure data is accessed through our labs at UCL's central London campus, or remotely through UCL's Data Safe Haven.

To download our Open datasets, and to apply for Safeguarded/Secure datasets, we ask users to create an account on CDRC Data. This allows us to better understand the impact of our research, and aggregated user statistics are part of our funder's reporting requirements.

[View our Datasets](#)

Consilium Data - Due Diligence Report

Patrick Ballantyne, University of Liverpool



1. What is Consilium?

Consilium is Edge Analytics' Local Plan Database; data and associated documentation for local planning authorities about housing projects that are currently taking place or will be in the future. It contains data on all Local Planning Authorities (LPAs) across England and Wales, and is assembled by bringing together a wide range of data and documentation from the LPAs, either directly, or from their respective websites, with additional data sourced directly from the Department for Levelling Up, Housing and Communities.

2. Available Data

Consilium comprises four datasets, covering all LPAs in England and Wales, some are macro (LPA-level), and some are micro (rows correspond to individual sites within LPAs):

Local Plan Status Extract [macro]

This data includes details about all Local Plans in each LPA including information on the status of the plan, target total housing requirements, and results of the Housing Delivery Test (HDT) which describes homes delivered against homes required.

Macro-level Data Extract [macro]

This data includes greater details about the individual Local Plans in each LPA, including a detailed breakdown of housing delivery since 2001, current levels of demand and projected future delivery. Each column represents progress on these aspects from 2001 to 2044.

Site Data Extract [micro]

This data extract includes geocoded site data, comprising information about planning status and permissions, total capacity, landowners, developers etc. Geographic information available include Addresses, Eastings/Northings, and Census Output Areas. There are a series of columns (e.g., 2022-2023, 2023-2024) which describe phasing of housing projects per year.

Site Data Extract (Brownfield Sites) [micro]

This data extract includes geocoded information about existing Brownfield sites within each LPA, comprising information on site area, ownership status, proposed deliveries on the site, number of dwellings it could support, and whether or not hazardous substances are present. Geographic information available is Eastings/Northings and Lat/Lon.

3. Potential Research Applications

1. *Understanding housing growth:* is new housing supply is keeping up with increasing demand in areas (Census 2021)?
2. *Urban growth and change:* can we predict how the social composition of local areas is changing in response to new housing developments?
3. *Benchmarking housing delivery:* assessing the performance of local plans against actual delivery, and exploring any regional inequalities.
4. *Education:* predicting future pupil yield and/or increased demand on schools (and nearby services).

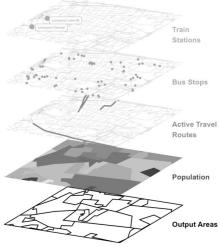
4. Recommendations and Notes

Consilium could be a useful asset for the CDRC, particularly in expanding our existing portfolio of datasets and themes, as well as facilitating new research projects into housing supply/demand. Both micro and macro level data provided by Consilium could be of great utility, however there are a few considerations:

- 1) *Non-specialist language:* lots of the Consilium documentation and files assumes expert knowledge of housing and planning terminology (e.g., 5 yr supply). Significant time might be needed to populate CDRC metadata files with interpretable variable descriptions that assume no specialist knowledge.
- 2) *Data delivery:* I received samples for one single LPA as a singular .csv file, but for data.cdr.ac.uk I would ask that Consilium provide, for each of the four Consilium datasets, all LPAs in one file as opposed to separate spreadsheets. Kate Staines (kate.staines@edgeanalytics.co.uk) at Edge Analytics has assured me that this is possible.
- 3) *Data quality:* From the samples I have received there are no glaring issues with quality, although I only have one LPA sample, so it is impossible to say for sure without seeing data for all LPAs. An important point to note is that a large number of variables in the Macro-level data extract are available only for LPAs in Wales. Furthermore, with the site data extracts, only Output Areas where projects are ongoing/planned are included, thus not all OAs in England/Wales will be present.

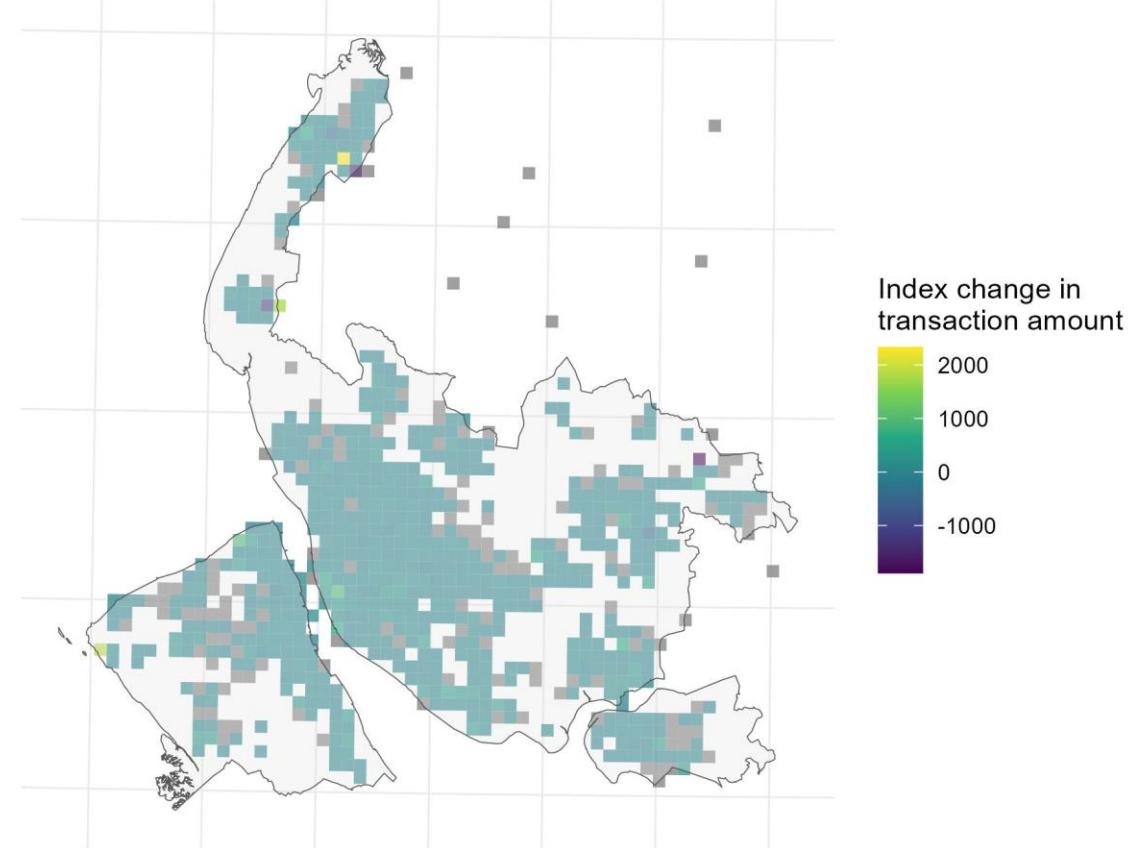
Research Data Scientist

New data acquisition



How did consumer spending change during the week of Eurovision?

Deriving insight from Mastercard transaction data pre and during Eurovision



Research Data Scientist

Data and research promotion



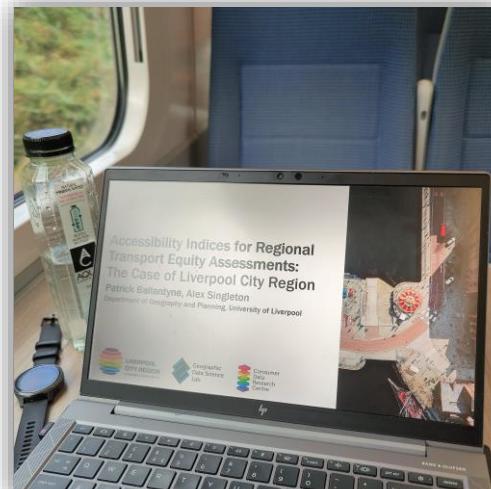
Demographics and Working from Home Geographies

Hamish Gibbs¹, Patrick Ballantyne², James Cheshire¹,
Alex Singleton², Mark Green²

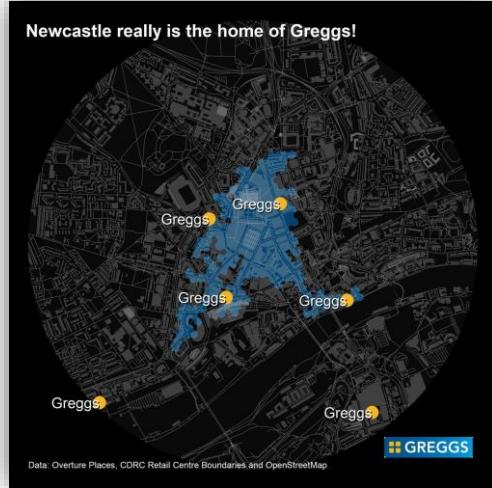
¹Department of Geography, UCL

²Department of Geography and Planning, University of Liverpool

Accepted for publication: Harnessing mobility data to capture changing work from home behaviours between censuses. H. Gibbs, P. Ballantyne, J. Cheshire, A. Singleton, M. A. Green. Geographic Journal. 2023.



Newcastle really is the home of Greggs!



Geography and Data Science for Public Good
Data-Driven Evidence and Solutions to Social and Spatial Inequalities

SESSION ORGANISERS

Dr. Patrick Ballantyne
University of Liverpool

Prof. Rachel Franklin
Newcastle University

Prof. Alex Singleton
University of Liverpool

CALL FOR PAPERS, HONOLULU, 2024

We are welcoming innovative and exciting papers that leverage the power of **Geography, Data Science and GIS** to:

- Unearth new evidence about the existence of social and spatial inequalities
- Support policy and design creative solutions to mitigate the impacts of social and spatial inequalities

Topics include (but not limited to): transport, housing, employment, accessibility to services and amenities, health, environment

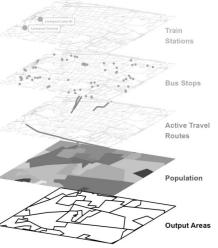
Abstracts and enquiries to: P.Ballantyne@liverpool.ac.uk

Dr. Patrick Ballantyne

Geographic Data Science Lab, University of Liverpool

Presentation for 'Applications of GIS', University of Sheffield

Today's Talk



How did I get here?



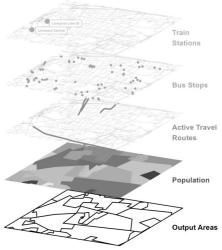
Postdoctoral Researcher? Data Scientist?



Establishing A Research (Impact) Profile

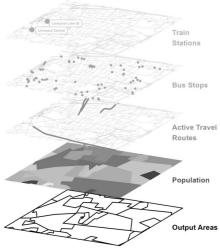
Establishing A Research (Impact) Profile

Focus on the easy wins and trending topics



Establishing A Research (Impact) Profile

Focus on the easy wins and trending topics



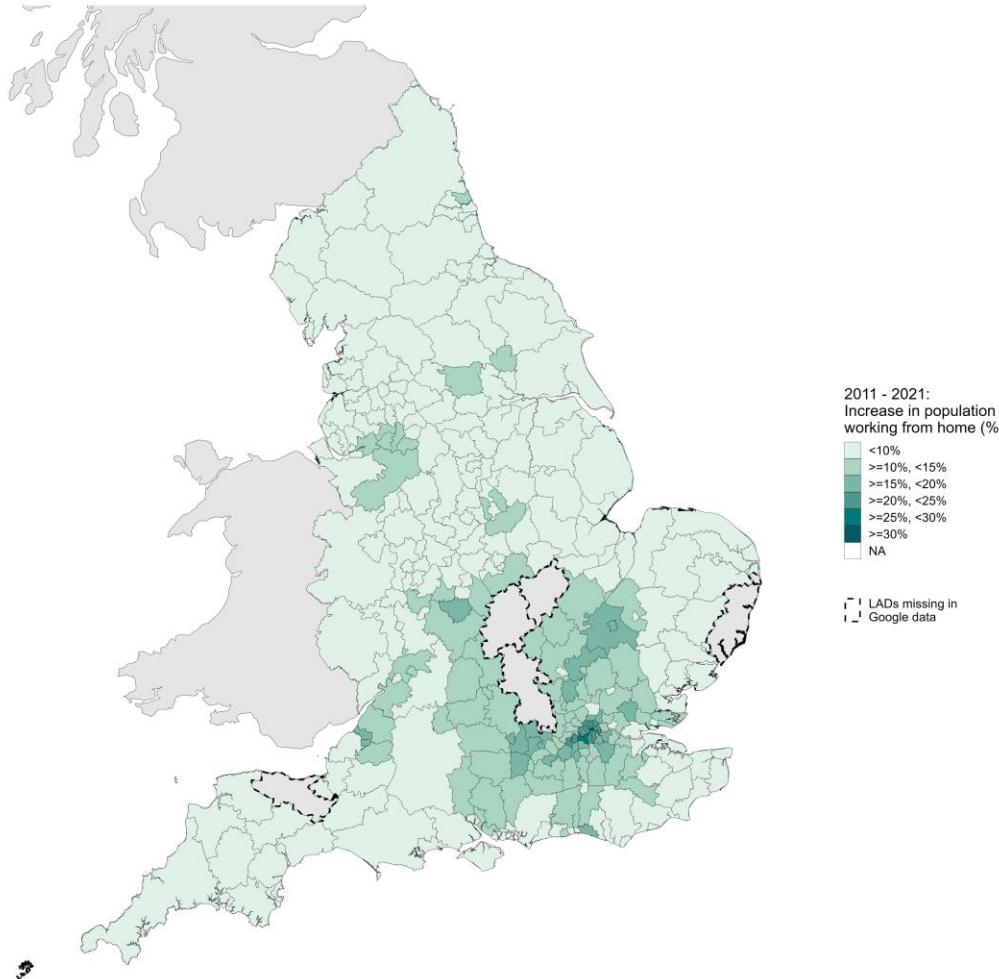
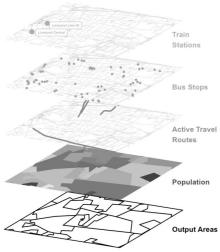
A woman with curly hair and glasses is sitting at a desk in a bright room, working on a laptop. On her desk are a white mug, a yellow notebook, and a potted plant. A desk lamp is positioned above her laptop. In the foreground, there is an inset image of an aerial photograph of a residential neighborhood. Overlaid on the image is a white box containing the text: 'Census 2021 will reveal how a year of lockdowns and furlough has transformed the UK'. Below this, smaller text reads: 'Published: March 18, 2021 2:29pm GMT' and 'The 2021 census will help show the changes wrought by a year of COVID-19. K303/Shutterstock'. At the bottom of the inset, there are social media sharing options (Email, Twitter, Facebook, LinkedIn, Print) and a disclosure statement.

Working from home is here to stay!

- What are the historical patterns of working from home?
- What is unusual about the 2021 census?
- Does mobile phone data accurately capture working from home?
- Can everybody work from home?

Establishing A Research (Impact) Profile

Focus on the easy wins and trending topics



Received: 2 March 2023 | Revised: 26 September 2023 | Accepted: 27 September 2023

DOI: 10.1111/geoj.12555

ARTICLE

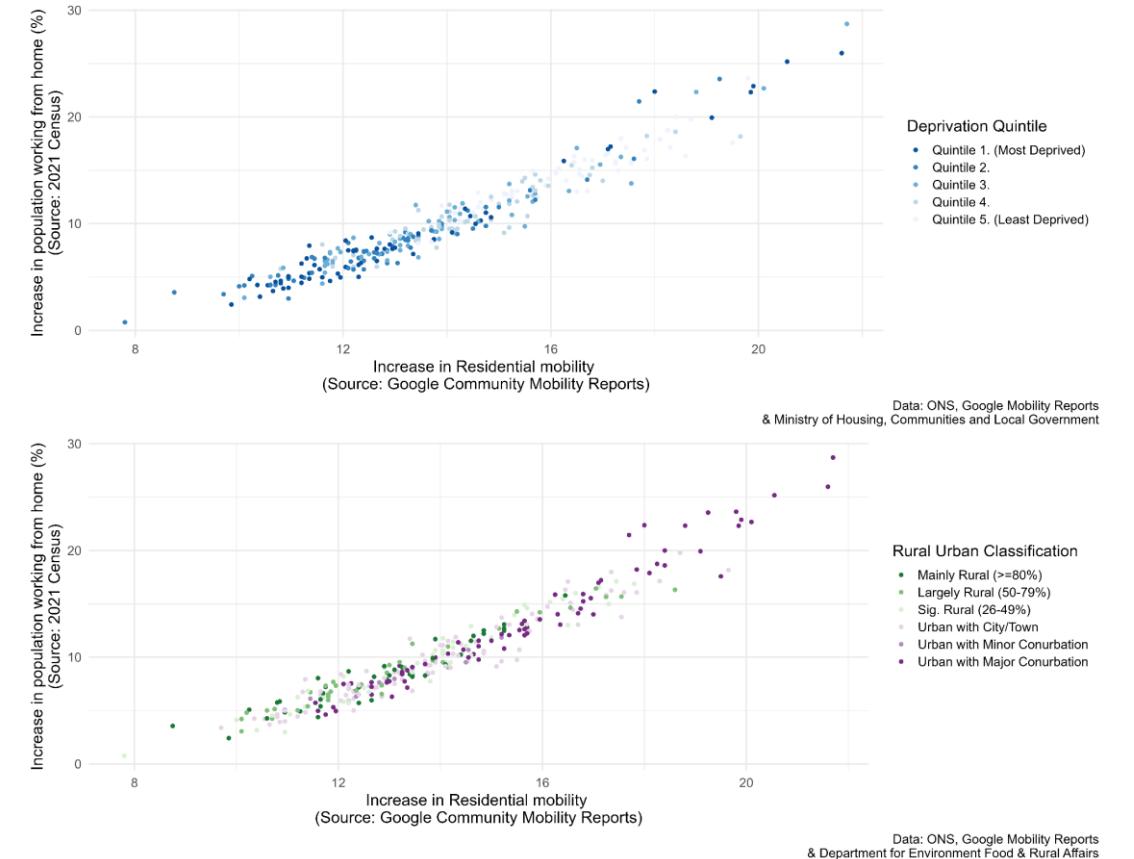
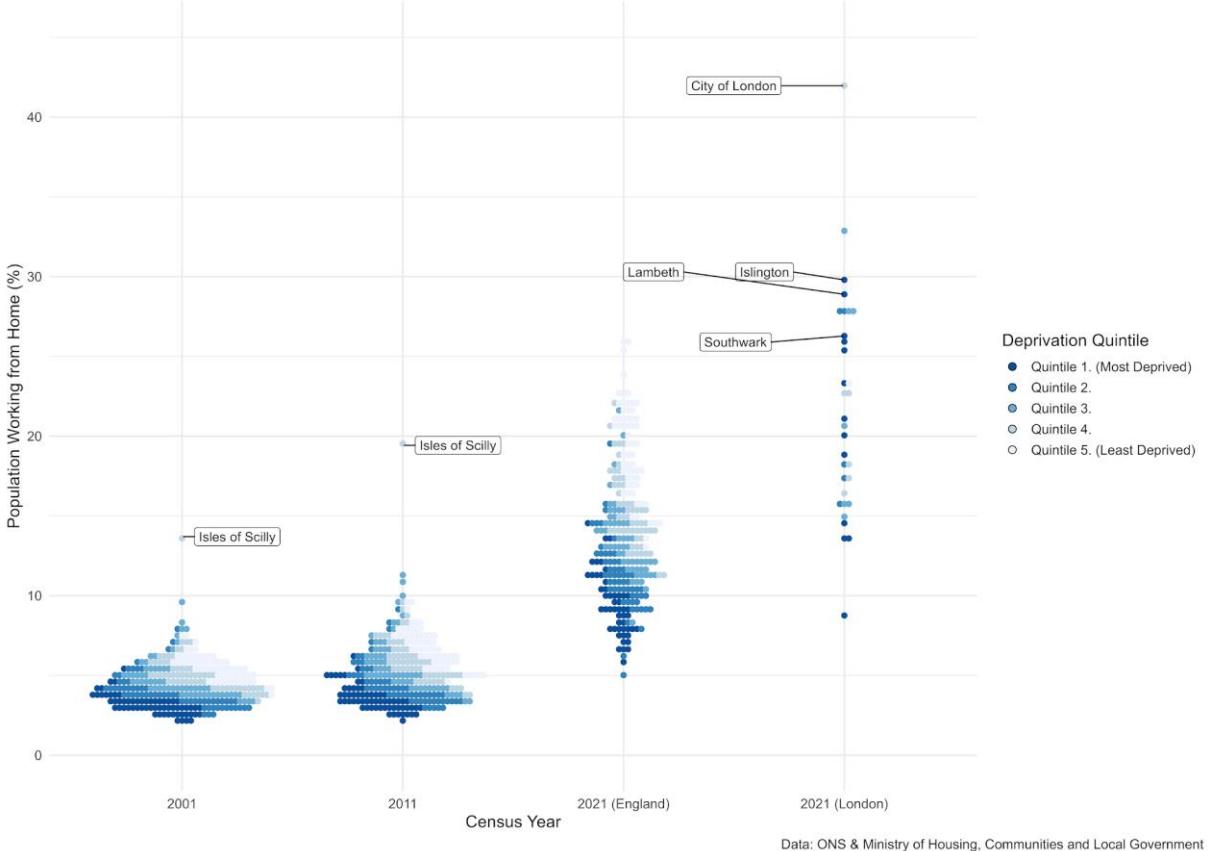
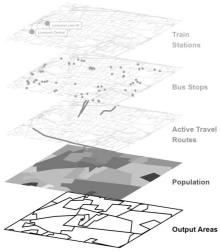
Harnessing mobility data to capture changing work from home behaviours between censuses

Hamish Gibbs¹ | Patrick Ballantyne² | James Cheshire¹ | Alex Singleton² | Mark A. Green²



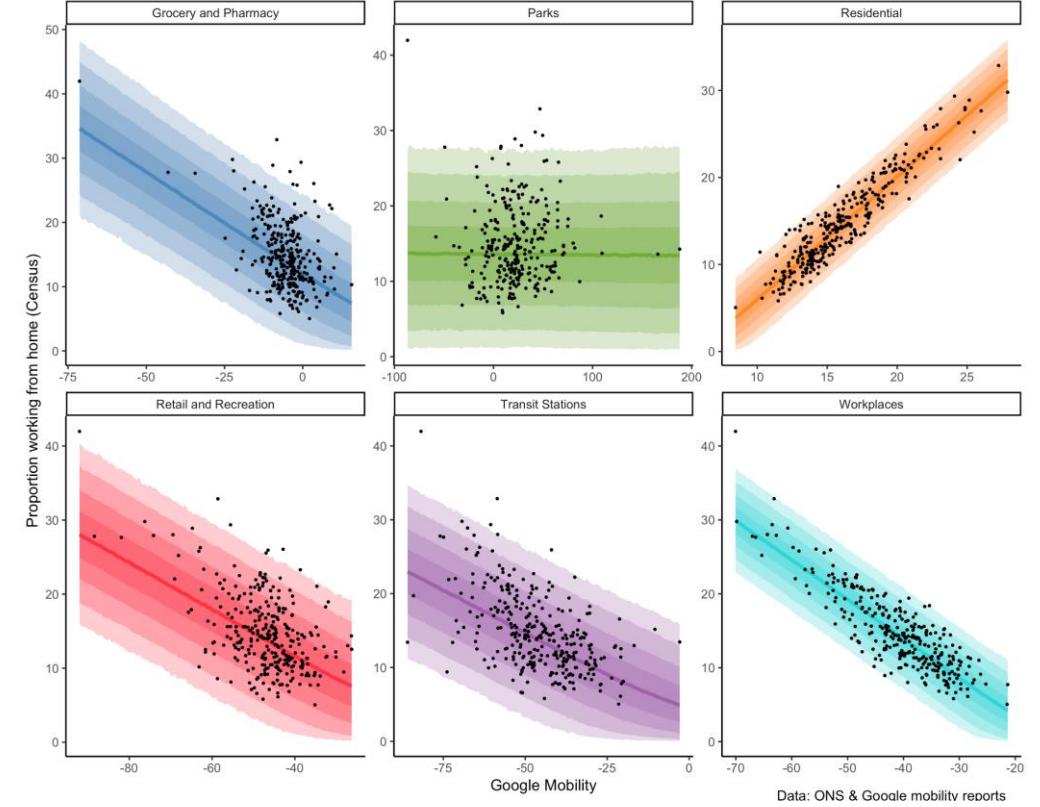
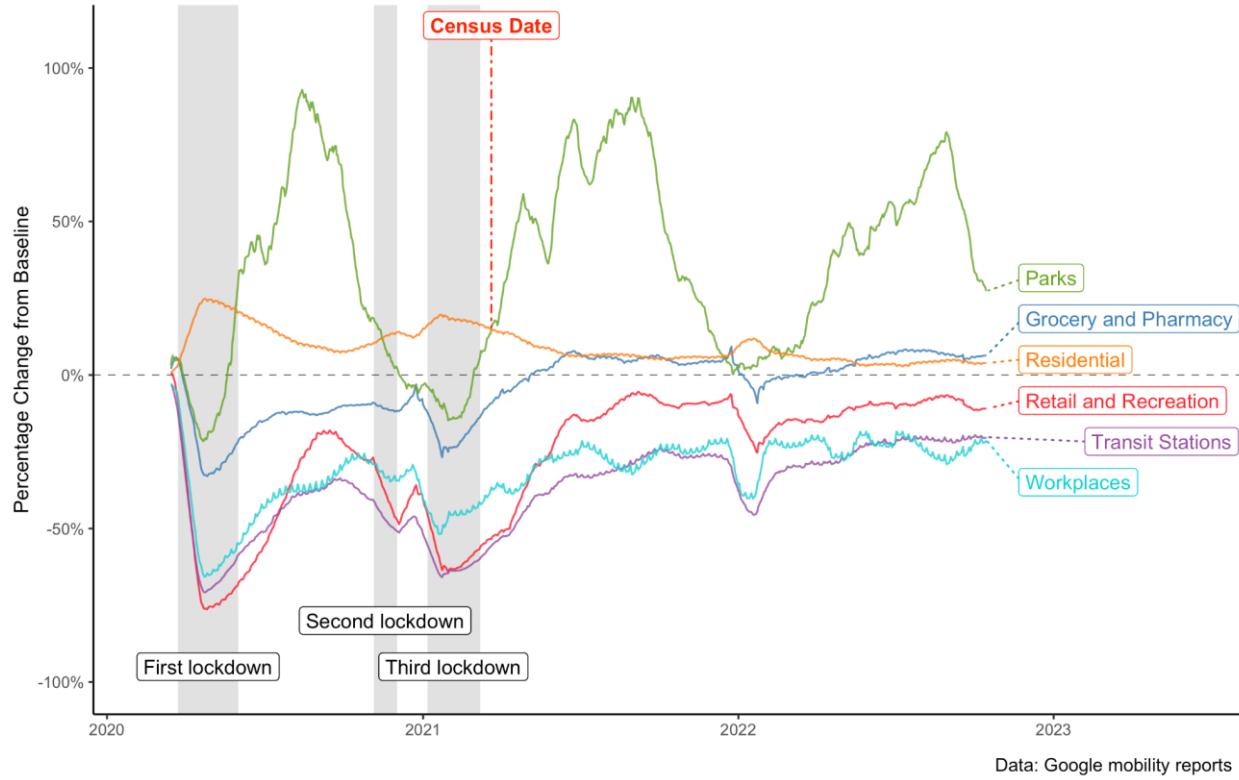
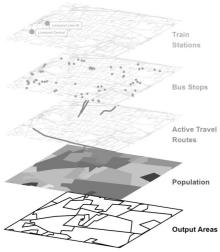
Establishing A Research (Impact) Profile

Focus on the easy wins and trending topics



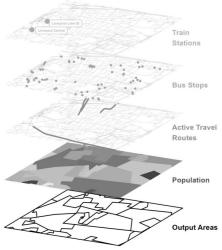
Establishing A Research (Impact) Profile

Focus on the easy wins and trending topics



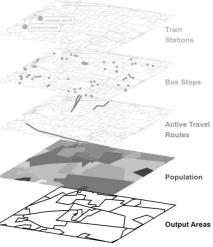
Establishing A Research (Impact) Profile

Generating impact: supporting evidence-led decision making



Establishing A Research (Impact) Profile

Generating impact: supporting evidence-led decision making



Domain 1.
Access to the
Transport
Network

Domain 3.
Economic
Development

Poor public
transport, high
deprivation

**Compound
Regional
Inequalities**

Poor public
transport,
limited job
opportunities

Limited job
opportunities, no
future housing
planned

High
deprivation, no
future housing
planned

Domain 2.
Deprivation /
Socioeconomic
status

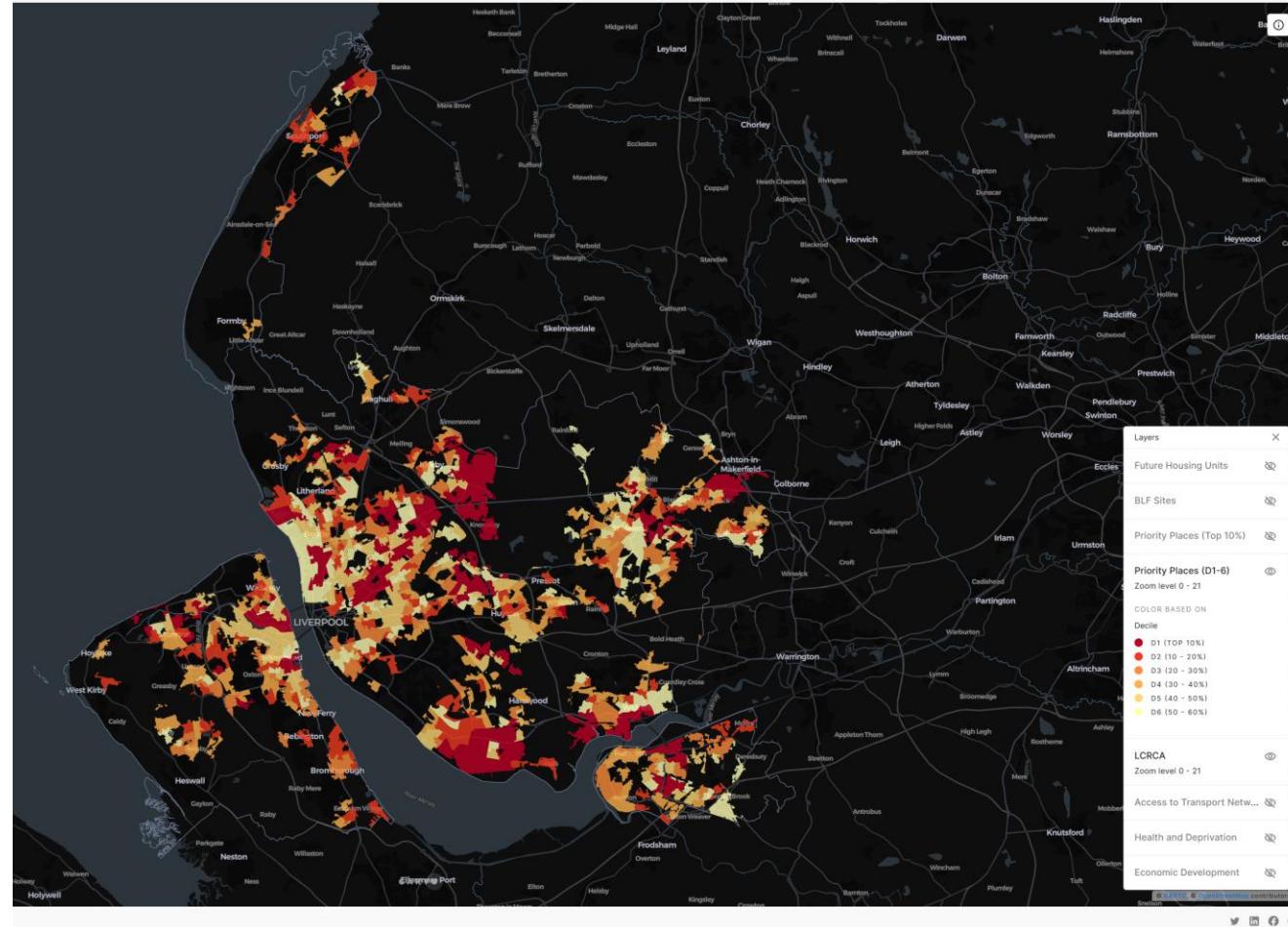


**LIVERPOOL
CITY REGION**
COMBINED AUTHORITY

Domain 4.
Housing
Opportunities

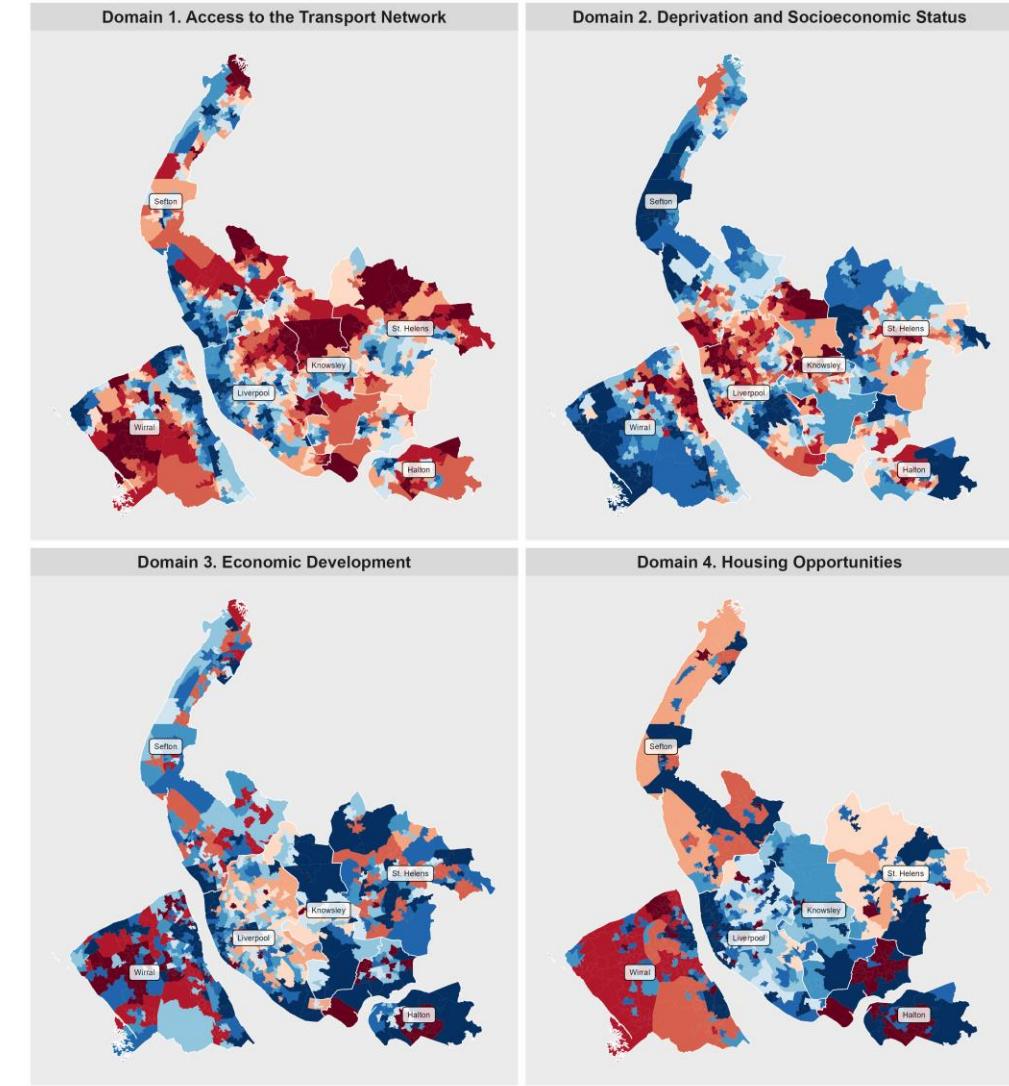
Establishing A Research (Impact) Profile

Generating impact: supporting evidence-led decision making



Dr. Patrick Ballantyne

Geographic Data Science Lab, University of Liverpool

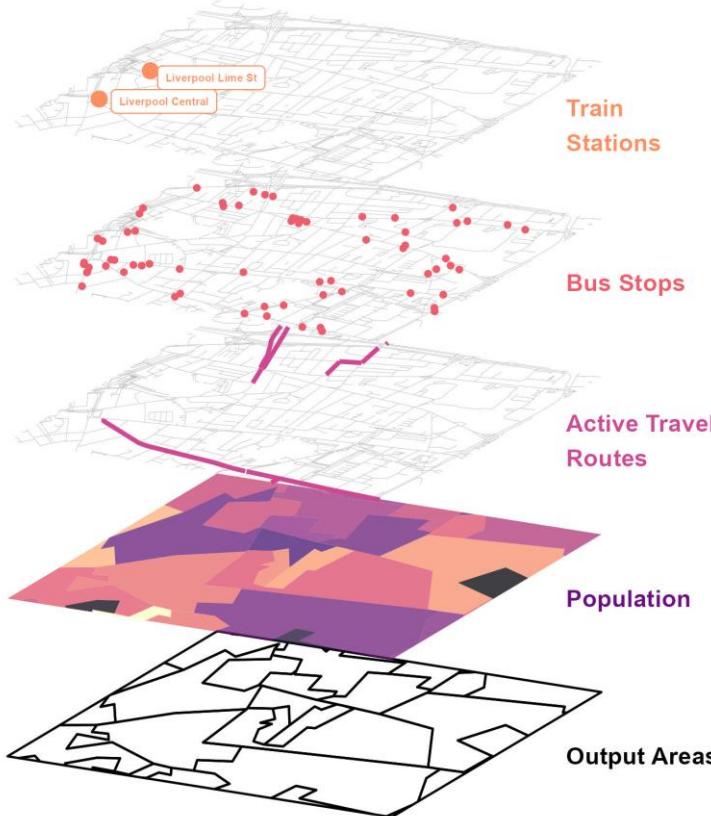
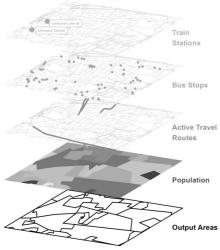


Indicator Decile D1 (Worst Outcome) D2 D3 D4 D5 D6 D7 D8 D9 D10 (Best Outcome)

Presentation for 'Applications of GIS', University of Sheffield

Establishing A Research (Impact) Profile

Generating impact: supporting evidence-led decision making

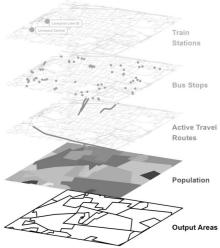


Delivering a **sustainable** and
equitable future for
Liverpool City Region



Establishing A Research (Impact) Profile

Generating impact: supporting evidence-led decision making



To develop Pipeline ii, the University of Liverpool had been commissioned to undertake a mapping exercise using publicly available data and created data sets which focused on the following:

- Access to the transport network;
- Health and deprivation;
- Existing economic development and housing;
- Future economic development and housing.

Engagement with constituent Local Authorities on pipeline ii had commenced, with further engagement with stakeholders taking place during November and December 2023. Following this, scheme development options would commence in January 2024.

Members raised the following questions and comments:

- Clarity was sought on whether the active travel proposals would extend to Lydiate and Maghull?
- The place-based approach to pipeline ii was welcomed along with the approach to engaging stakeholders. However, assurance was sought on how Elected Members from across the City Region would be engaged in the development of pipeline ii.
- Confirmation was sought on who was being consulted and whether invitations had been sent out.
- Was there any risk to the Headbolt Lane station development, as a consequence of the Buckingham Group going into administration?

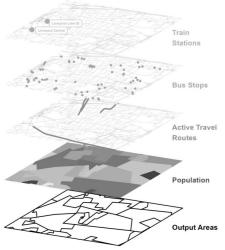


Looking across to the former St James Station platform windows clearly visible (Image: James Maloney/Liverpool Echo)



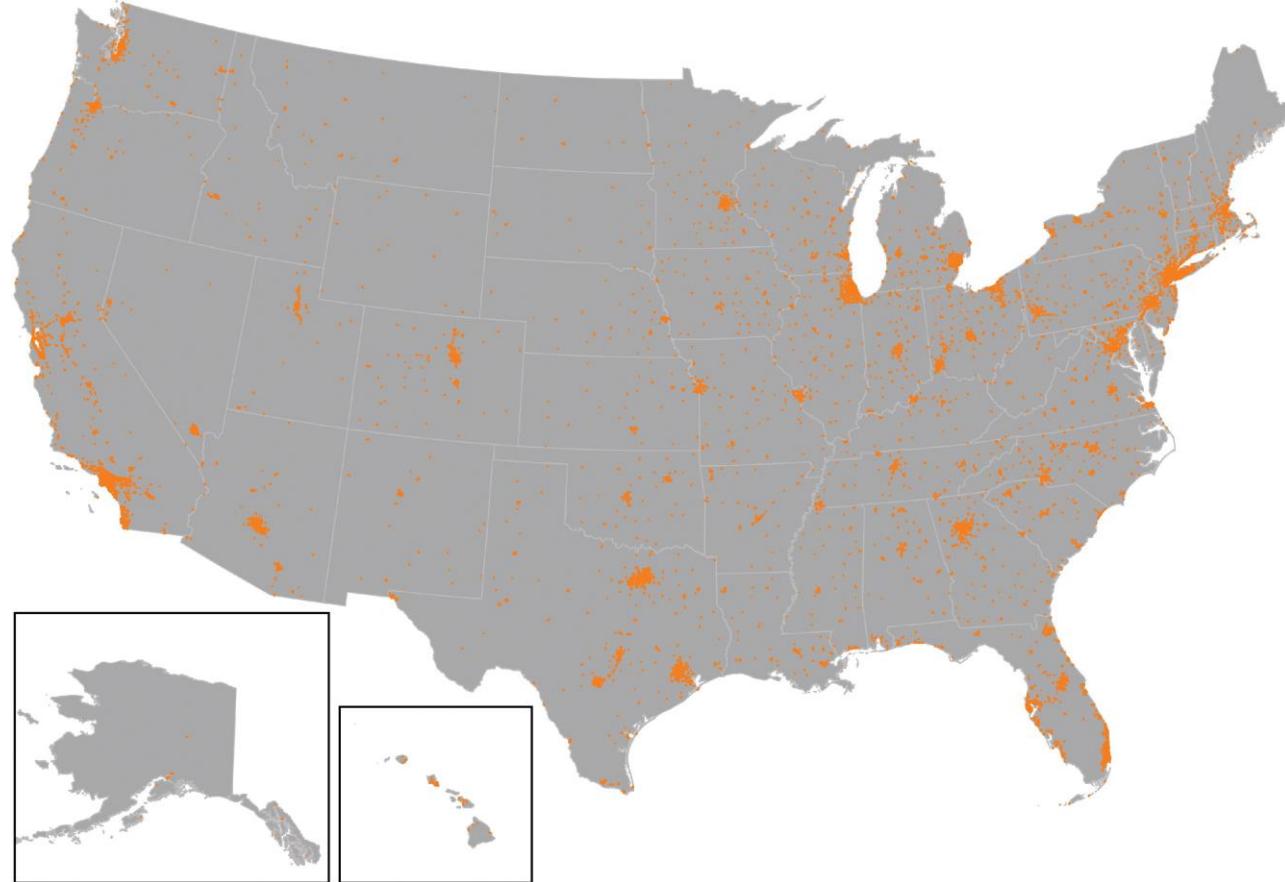
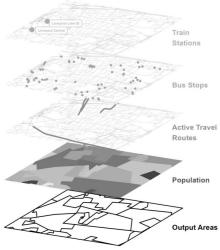
Establishing A Research (Impact) Profile

Stimulating commercial interest and fostering partnerships



Establishing A Research (Impact) Profile

Stimulating commercial interest and fostering partnerships



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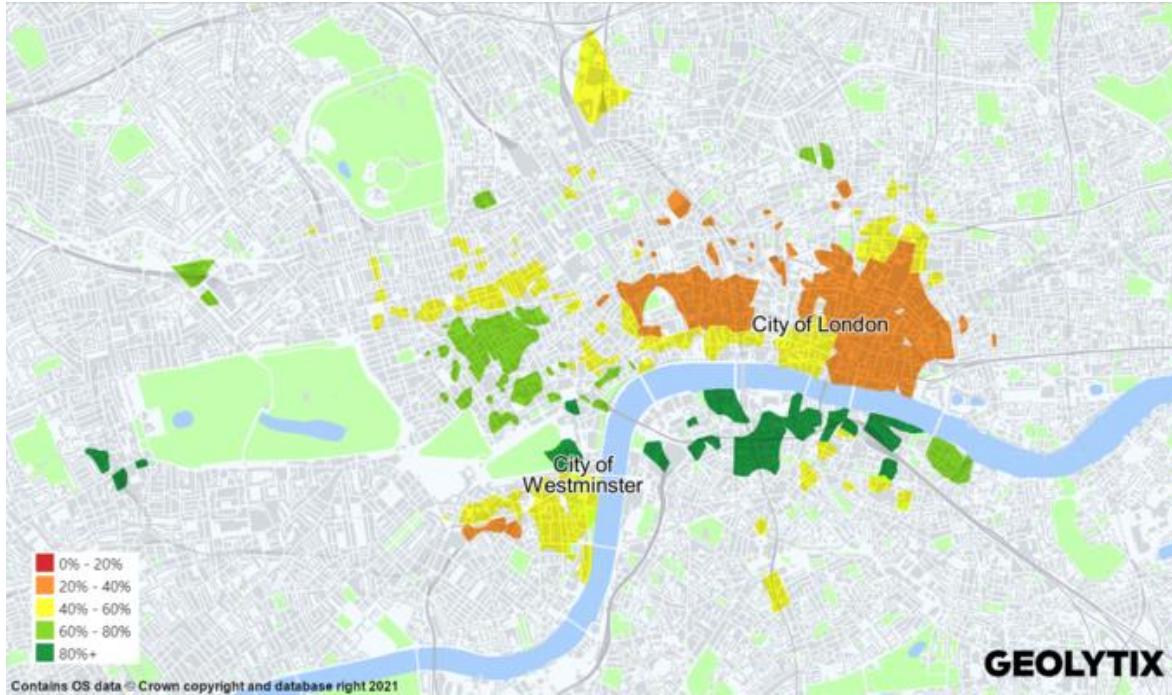
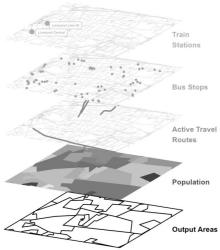
Integrating the Who, What, and Where of U.S. Retail Center Geographies

Patrick Ballantyne*, Alex Singleton*, Les Dolega*, and Jacob Macdonald†

* Department of Geography and Planning, University of Liverpool, UK † Department of Urban Studies and Planning, University of Sheffield, UK

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CITY CENTRE TOWN CENTRE URBAN CENTRE VILLAGE CENTRE PARADE

AIRPORT

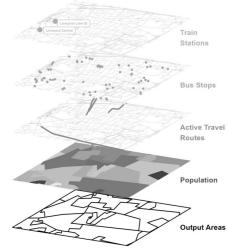
RAIL STATION

SERVICE AREA

LEISURE PARK OUTLET CENTRE RETAIL PARK SHOPPING CENTRE TRADE PARK

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SAFEGRAPH

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HOME

Welcome 🎉

About SafeGraph

SAFEGRAPH PLACES

Places Data Schema

> Base Attributes

Rich Attributes

Geometry Attributes

Parking Lots

ACCURACY

> Places Accuracy

CONSUMER INSIGHTS

Spend

About SafeGraph

Suggest Edits

SafeGraph curates the most accurate and precise database of global points of interest each month to power applications, platforms, and services with a location component. As a source of truth for the physical world, SafeGraph data provides an up-to-date record of where places are located and detailed attribution about each of those places, such as when it opened or closed, what type of place it is, what other places it is affiliated with, and how people interact with that location. SafeGraph delivers high quality data in a unified schema to reduce time spent cleaning and munging data, and serves as a partner in data curation and sourcing for organizations building location-based products and services. Keep reading our technical docs to see our schema, monthly metrics, and helpful information about data delivery and evaluations.

Our data covers an ever-growing list of POI and we always focus on producing industry-leading quality and accuracy. We even provide resources for you while [Evaluating the Data](#) to compare it against truth sets. You can also view our [Places Summary Statistics](#) for a detailed understanding of our data coverage.

SafeGraph updates the Places dataset every month and we transparently reveal all of our changes in our [Release Notes](#).

All SafeGraph datasets utilize `placekey` as the primary key and are formatted as delimited CSVs.



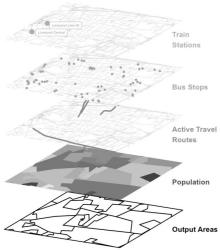
SAFE GRAPH

Table 1. Data set usage within each of the three components

Component	Data source	Data set	Usage
The where	SafeGraph	Core places	Aggregated to a grid of H3 polygons
		Geometry	
	OpenStreetMap	Retail land-use polygons	
		Core places	
The what	SafeGraph	Composition, diversity size, and function variables	Size and function variables
		Geometry	
	Environmental Protection Agency	Weekly patterns	Economic performance variables
		Smart location database	Size and function variables
The who	U.S. Census Bureau	American Community Survey	Economic health variables
		Weekly patterns	Calculating observed patronage (origin census tract, total visits)

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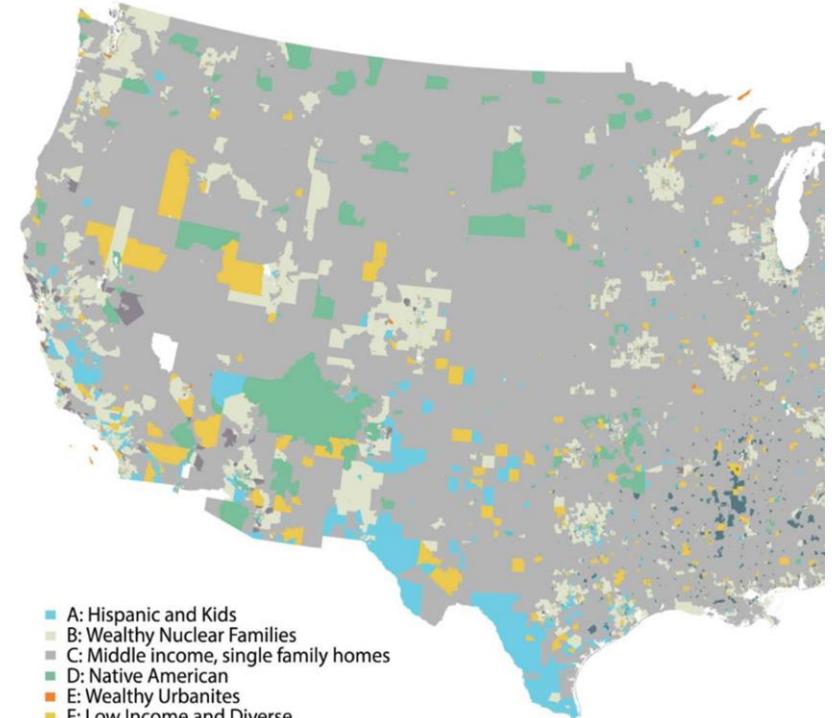


Retail and Geodemographics: A Spatial Data Science Approach

Patrick Ballantyne,
University of Liverpool

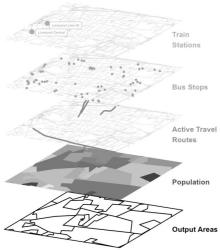


An ESRC Data
Investment



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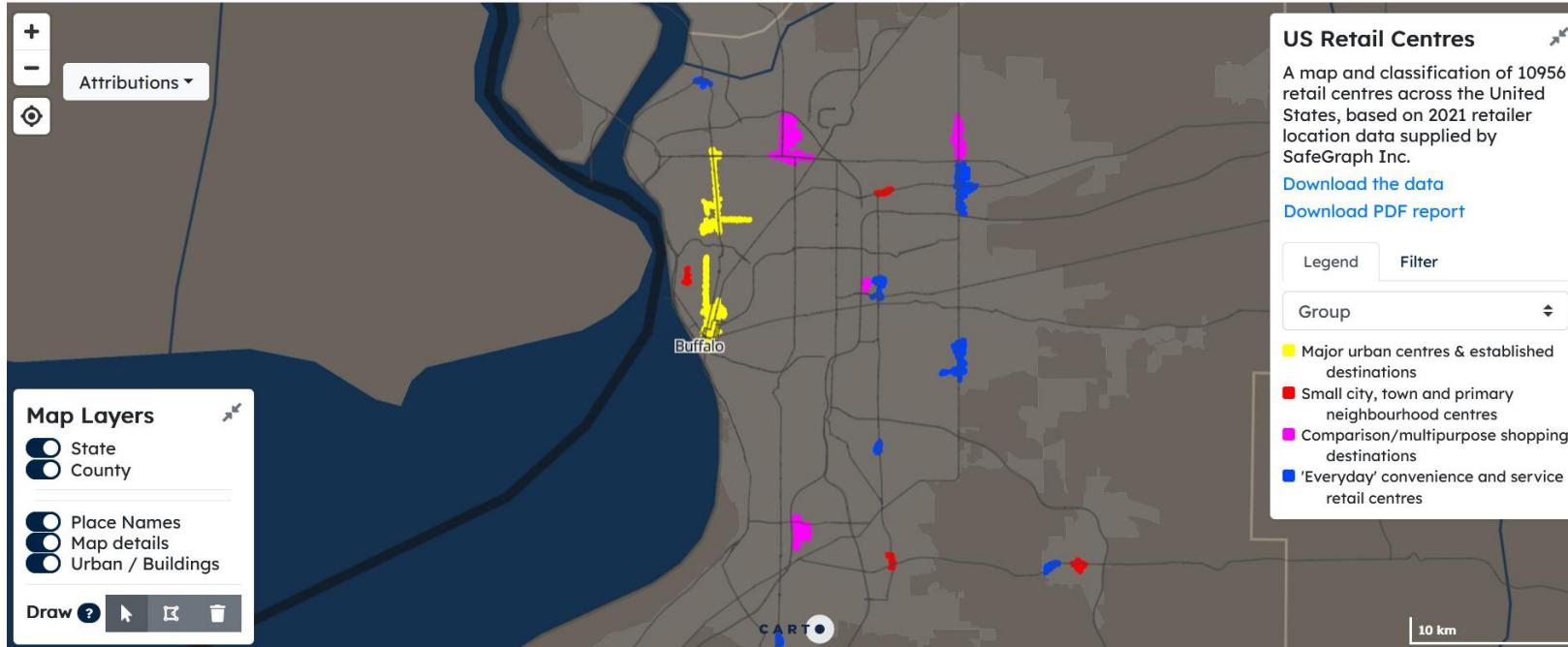
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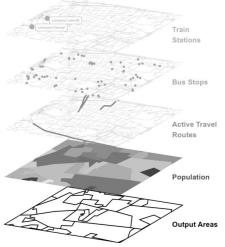
An ESRC Data
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CDRC Mapmaker

Population ▾ Retail ▾ Financial ▾ Digital ▾ Transport ▾



Today's Talk



How did I get here?



Postdoctoral Researcher? Data Scientist?



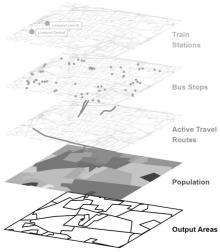
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Opportunities & Reflections

Opportunities & Reflections

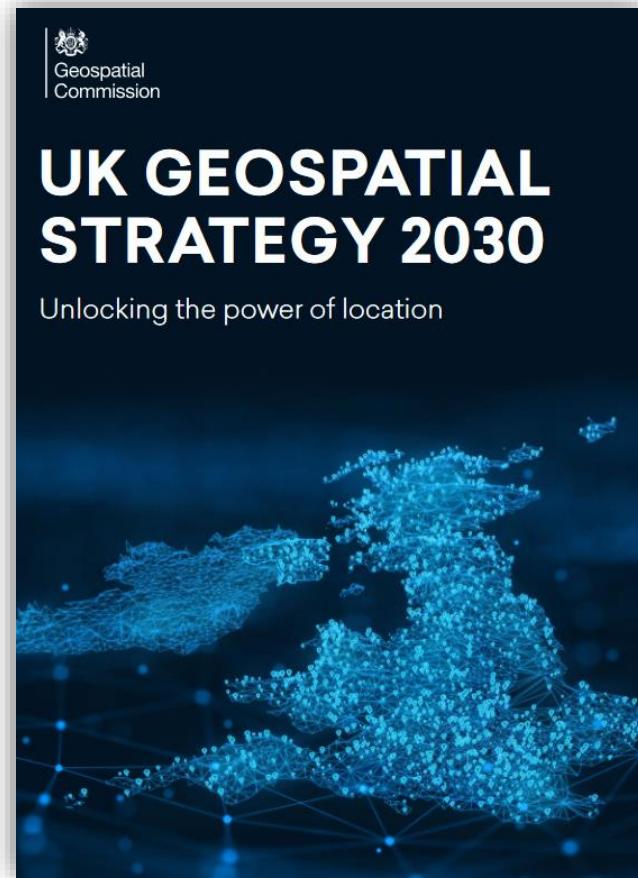
We need more spatial thinkers!



Many geography students fail to realise their value as scientists who are uniquely capable of 'spatial thinking'.

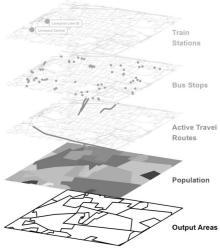
THIS IS AN IMPORTANT ASSET

Increasing investments are being made in spatial skills; 'spatial thinking' solves complex business and public sector needs



Opportunities & Reflections

Jobs! Jobs! Jobs!



Dean Riddlesden
Director of Data
Science and Insight



Ellen Talbot
Senior Business
Insight Analyst



Nikos Patias
Junior Policy
Analyst

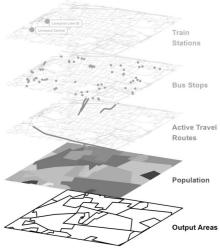


Niall Newsham
Postdoctoral
Researcher



Opportunities & Reflections

Some thoughts and advice...



Your toolbox should
have no lid...



Adapt, adapt, adapt



Be seen everywhere
and by everybody ...

Opportunities & Reflections

Shameless plug...



An ESRC Data
Investment

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Masters Dissertation Scheme

Masters Dissertation Scheme

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[Testimonials](#)

[CDRC Consumer Data for Research Projects](#)

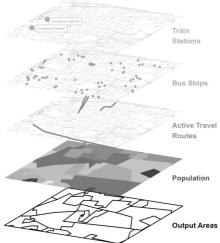
[Project Archive](#)

The Consumer Data Research Centre has run the Masters Dissertation Scheme for over ten years. The programme offers an exciting opportunity to link students on Masters courses and their university supervisors with leading retail companies, via projects which are important to the retail industry.

The scheme provides the chance for students to work directly with industrial partners, and to link students' research to important retail and 'open data' sources. The project titles are devised by the partners, and are open to students from a wide range of disciplines.

How to Apply

The next round of projects will be listed on this webpage from January 2024. If you are interested in applying for a project, please complete the [application form](#), and send it as an attachment to projects@cdrc.ac.uk, along with a copy of your CV. Both documents should be in



We need more spatial thinkers!

Perspectives from a Postdoctoral Researcher

Dr. Patrick Ballantyne

Geographic Data Science Lab, University of Liverpool

Get in touch:

P.Ballantyne@liverpool.ac.uk

@DrPatBallantyne

QUESTIONS?

