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Developing a classification of workplace zones (COWZ)

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Presentation overview

- Acknowledgements: David Martin, Andrew Harfoot, ONS/QIF, ONS Geography, WZUG, Chris Gale
- Why create a classification of workplace zones?
- What will the classification represent?
- How is it being created?
- Some early insights/observations …
- Where next?

Why create COWZ?

- Geodemographic/area classifications very useful for broad range of applications
  - Understanding patterns
  - Spotting similarities/differences in areas
  - Targeting sub-groups/areas
- Wide range of applications
  - Retail, transport, health, education, planning, academia etc.

Why create COWZ?

- Existing (official) classifications
  - 2001/2011 Output Area Classification (OAC) + higher level geographies

2001 OAC

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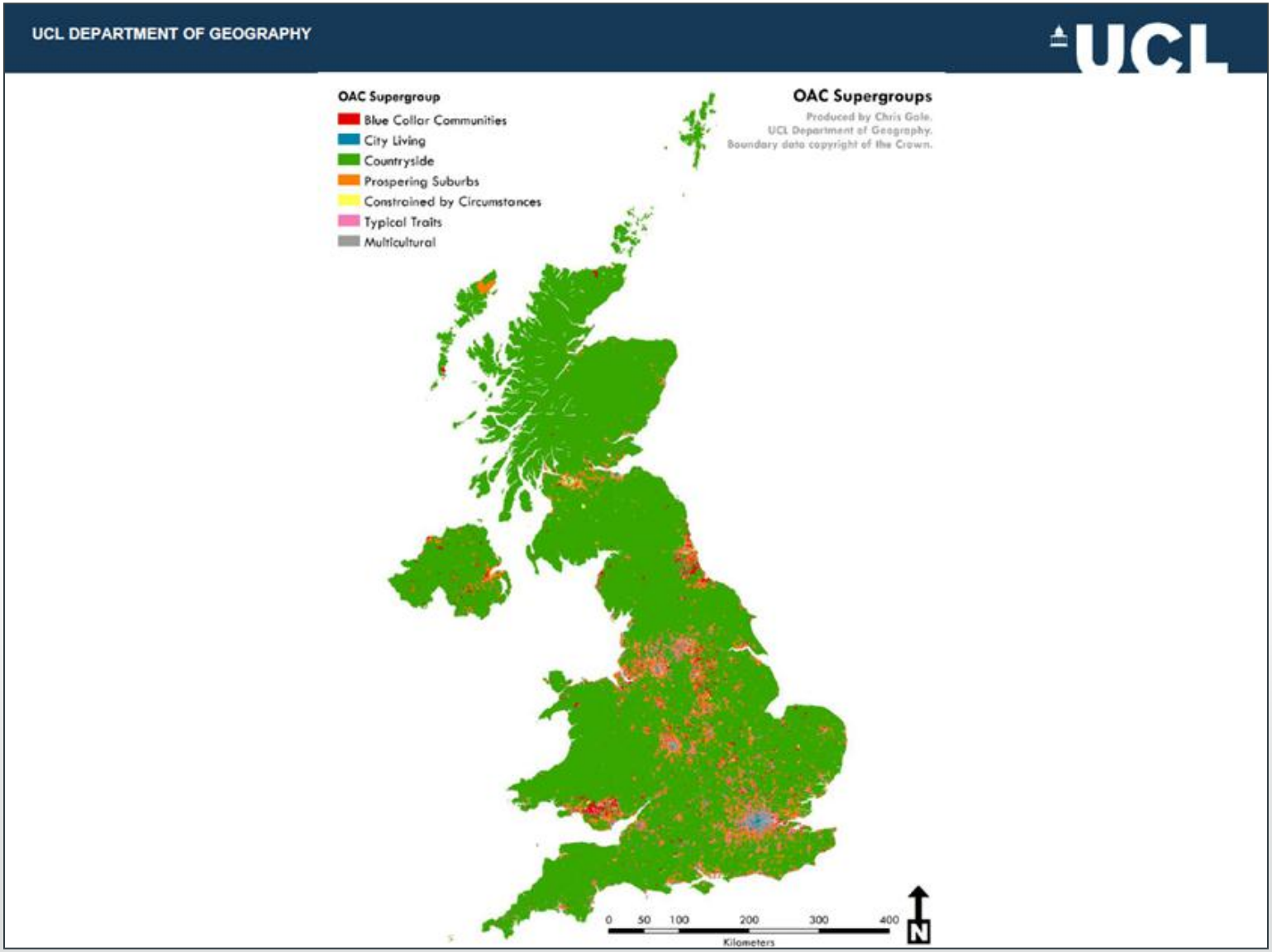

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2001 OAC

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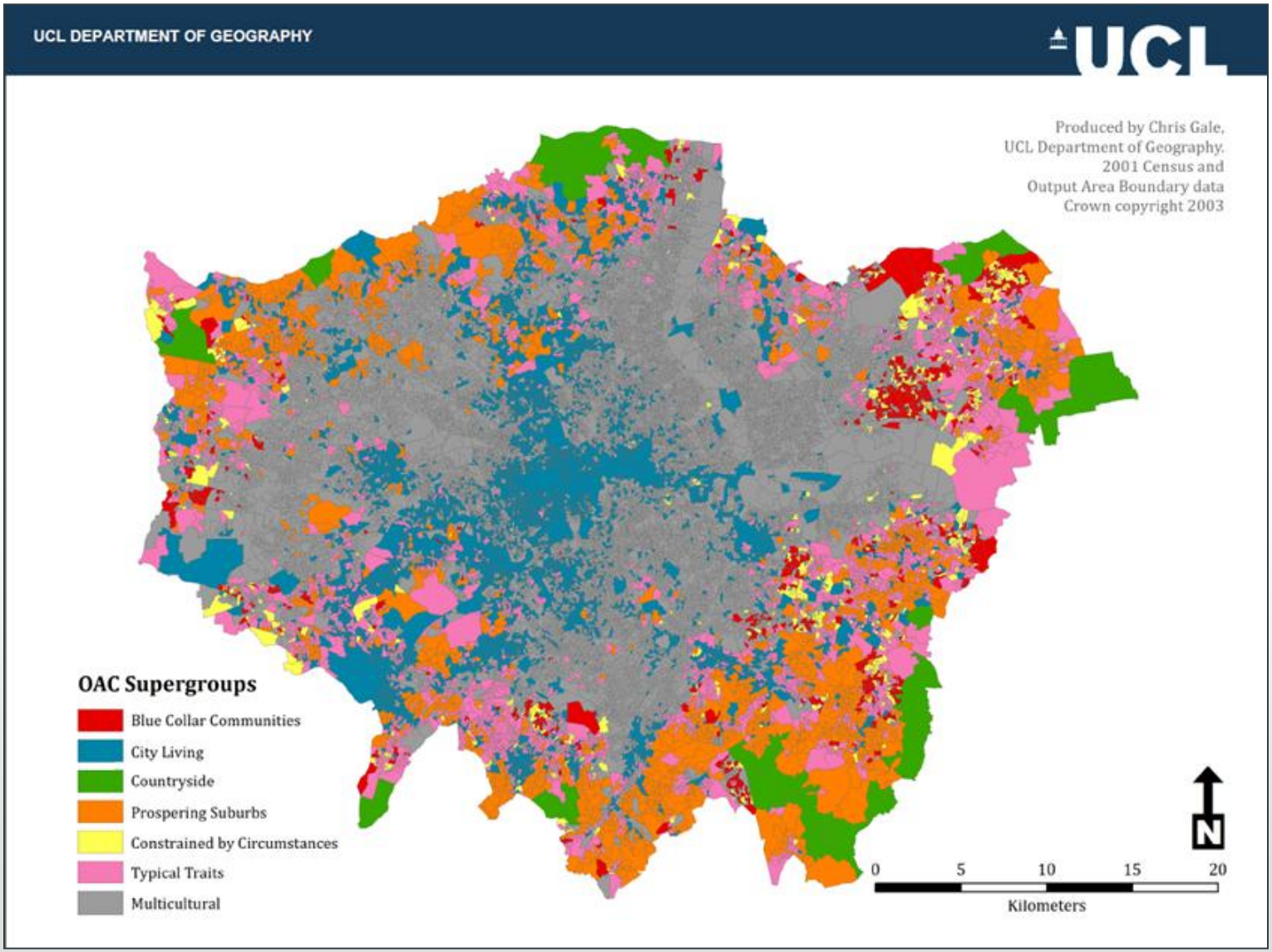

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Why create COWZ?

- Existing (official) classifications
  - 2001/2011 Output Area Classification (OAC) + higher level geographies
  - Built-up areas/sub-divisions
  - Urban/rural
- Some socio-economic and employment variables in 2001/2011 OAC
- But nothing specifically focusing on workers and workplaces

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An opportunity: Workplace Zones

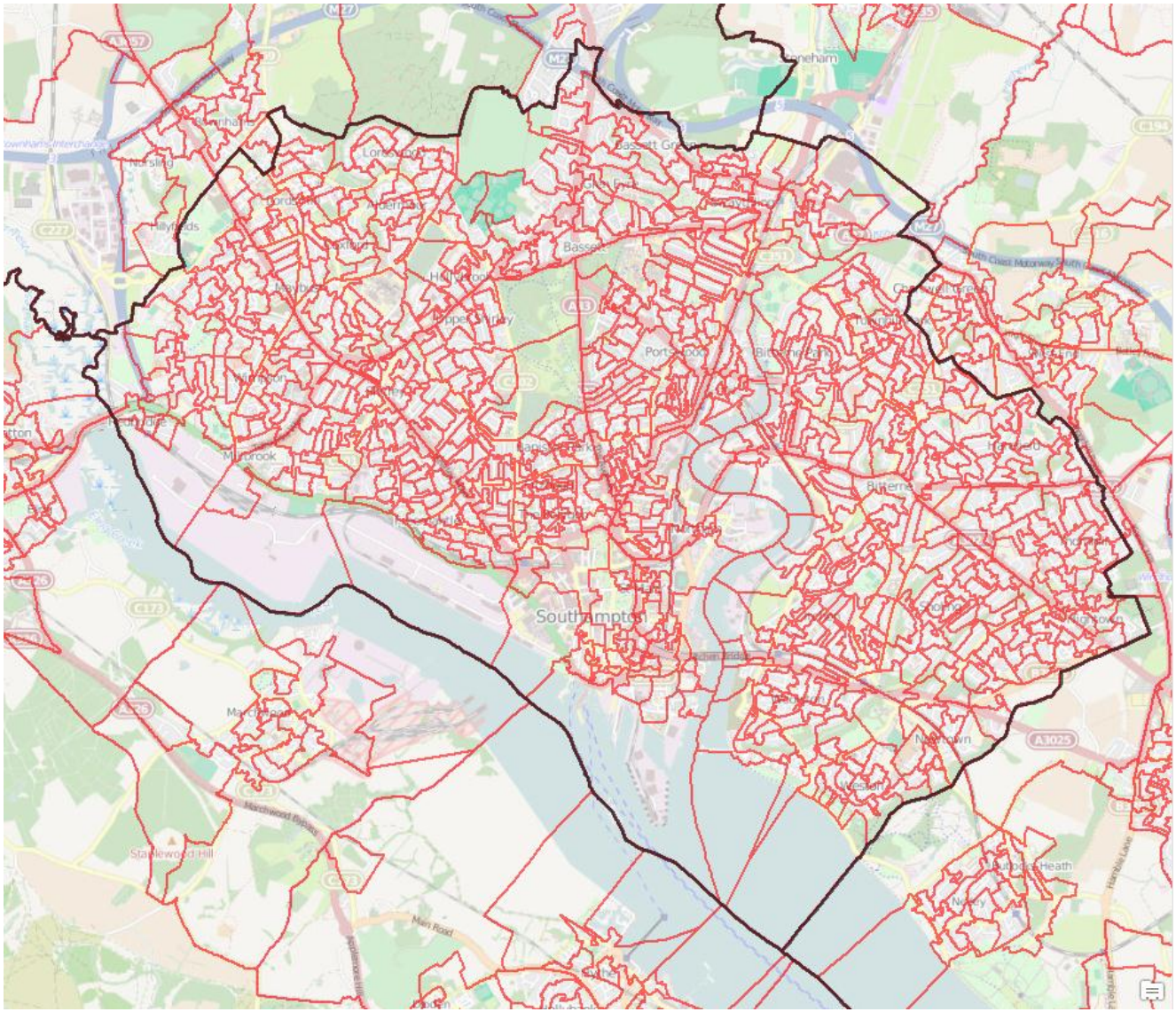
- New output geography (currently England & Wales) designed specifically for release and analysis of workplace-related data
- Much wider range of variables released in 2011 than 2001
- More appropriate geography for mapping/analysing

Workplace data released: 2001 v 2011

2001: OAs	2011: WZs	2011: WZs
Age	Population density	Welsh language skills * 2
NS-SeC	Sex by single year of age	Religion
Approximated social grade	Ethnic group	Passports held
Distance travelled to work	Country of birth	General health
	Highest level of qualification	Tenure – people
	Employment status	Occupation
	Hours worked	Length of residence in the UK
	Industry	
	NS-SeC	
	Approximated social grade	
	Distance travelled to work	
	Method of travel to work	
	Main language	

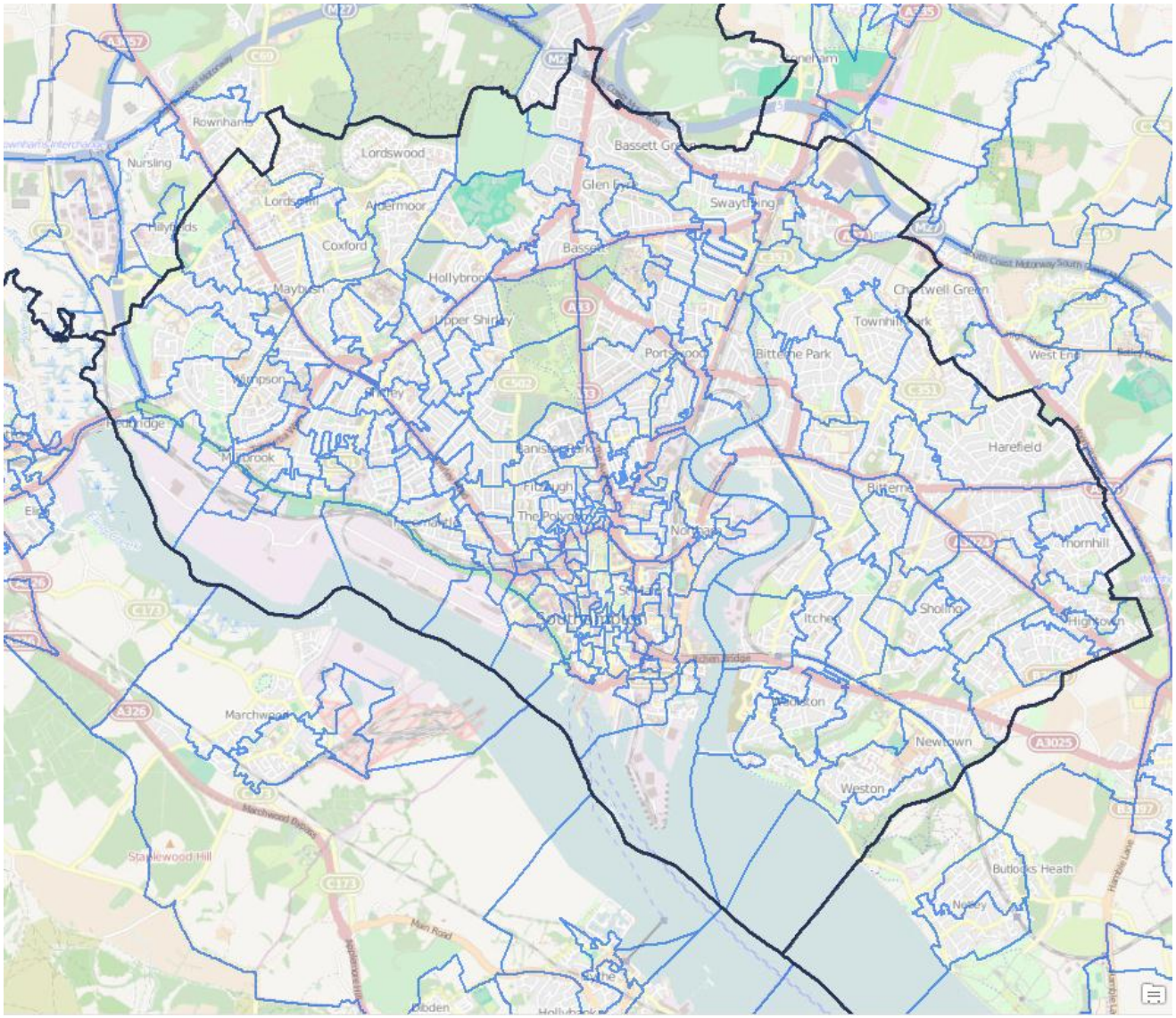
A ‘better’ geography for mapping/analysis

2011 Output Areas



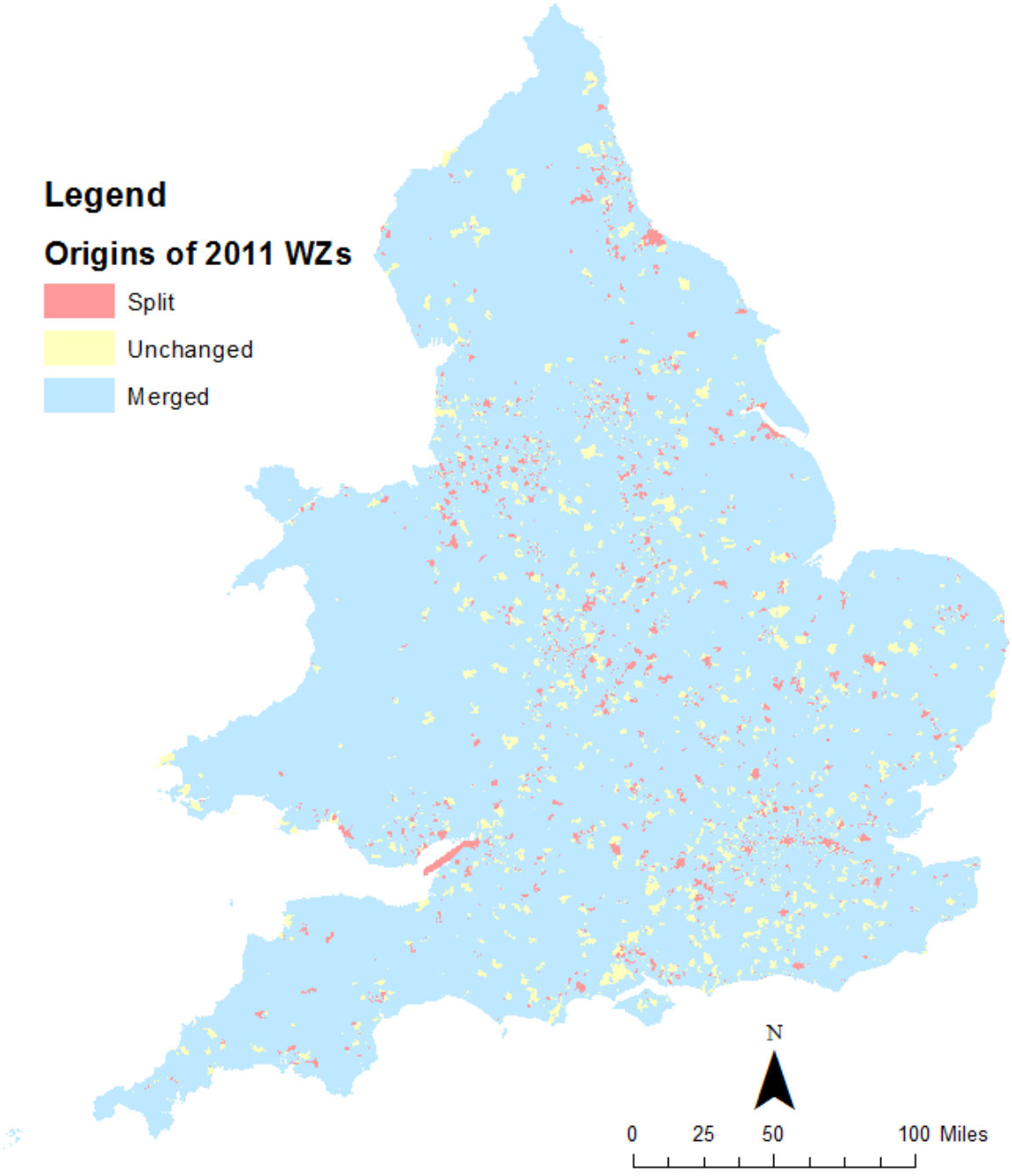
A ‘better’ geography for mapping/analysis

2011 Workplace Zones



2011 WZs: (N = 53,578)

Variable	Range	Mean
Workplace population	101-11,985	493
Workplace postcodes	3-113	22



Objectives: COWZ

- Develop a geodemographic classification of workplace zones (COWZ)
  - Based on characteristics of workers and workplaces
  - Using 2011 Census data
  - Initially for England and Wales (no WZs in Scotland or N Ireland)
  - Methods consistent with other classifications (OAC)
  - Transparent, reproducible, updateable

COWZ

- Funded by Quality Improvement Fund (QIF) and ONS
- Being developed by University of Southampton
- In consultation with Workplace Zone User Group (WZUG)
  - Representatives from public and private sector, with a shared interest in workplace-related data

COWZ: Methods

- Similar to 2001/2011 OAC:
  - Identify key dimensions
  - Identify and refine candidate list of variables
    - Explore statistical and spatial patterns
  - Transform variables if necessary
  - Standardise variables if necessary
  - Undertake clustering process (hierarchical k-means)
  - Evaluate results (in consultation with ONS/WZUG)
  - Refine methods and re-evaluate

Workplace data released: 2011

2011: WZs	2011: WZs
Population density	Welsh language skills * 2
Sex by single year of age	Religion
Ethnic group	Passports held
Country of birth	General health
Highest level of qualification	Tenure – people
Employment status	Occupation
Hours worked	Length of residence in the UK
Industry	
NS-SeC	
Approximated social grade	
Distance travelled to work	
Method of travel to work	
Main language	

Key dimensions: proposed

Dimension
Demographic structure of workplace population
Structure and composition of built environment
Socio-economic characteristics of workplace population
Employment characteristics of workplace population
Industry sector

Candidate variables: proposed (1)

Demographic structure of workplace population
Density of workplace population (persons per hectare)
Age/gender
Ethnic group/country of birth
Main language

Structure and composition of built environment
Density of workplaces (workplace postcodes per hectare)
Built environment composition (ratio of OAs:WZs)

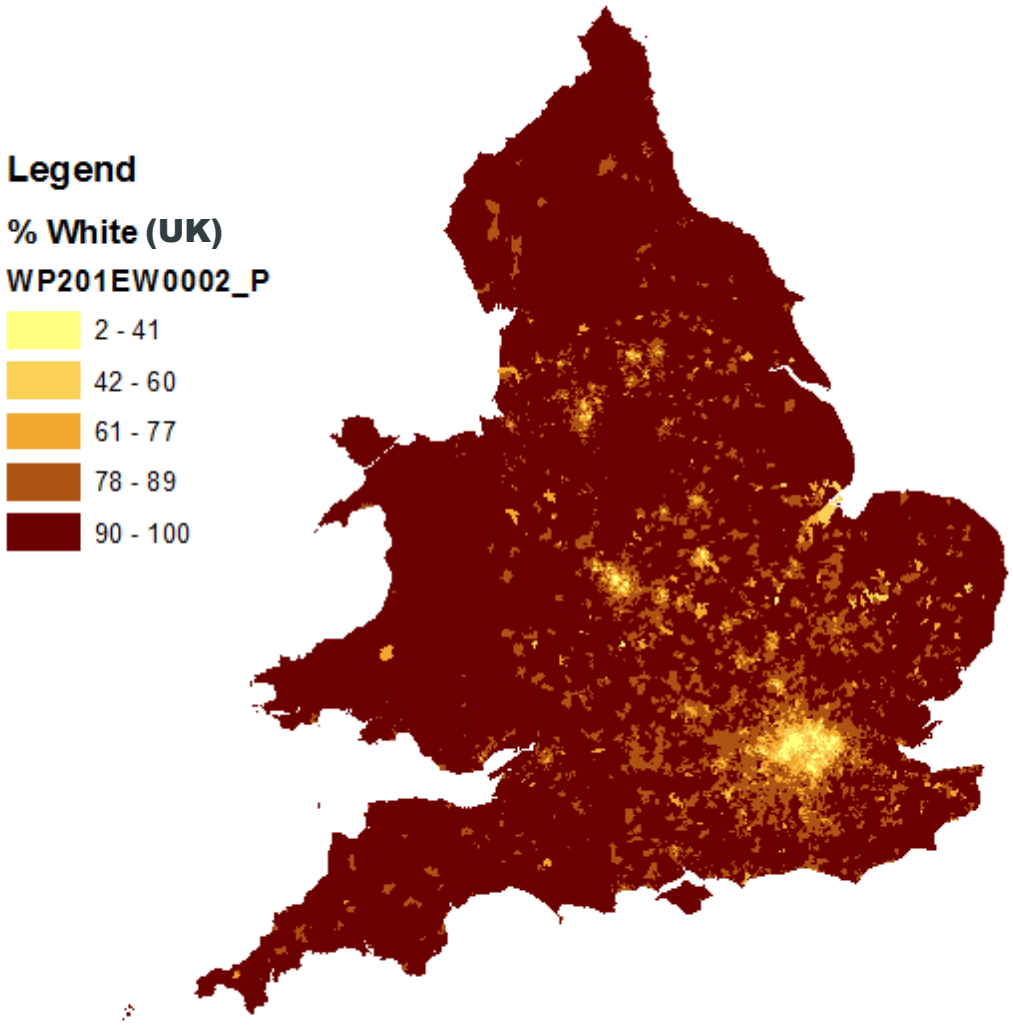
Candidate variables: proposed (2)

Socio-economic characteristics of workplace population
Education (highest level of qualification)
Social grade/social class/occupation (ASG, NS-SeC)
Travel to work (method, distance travelled)

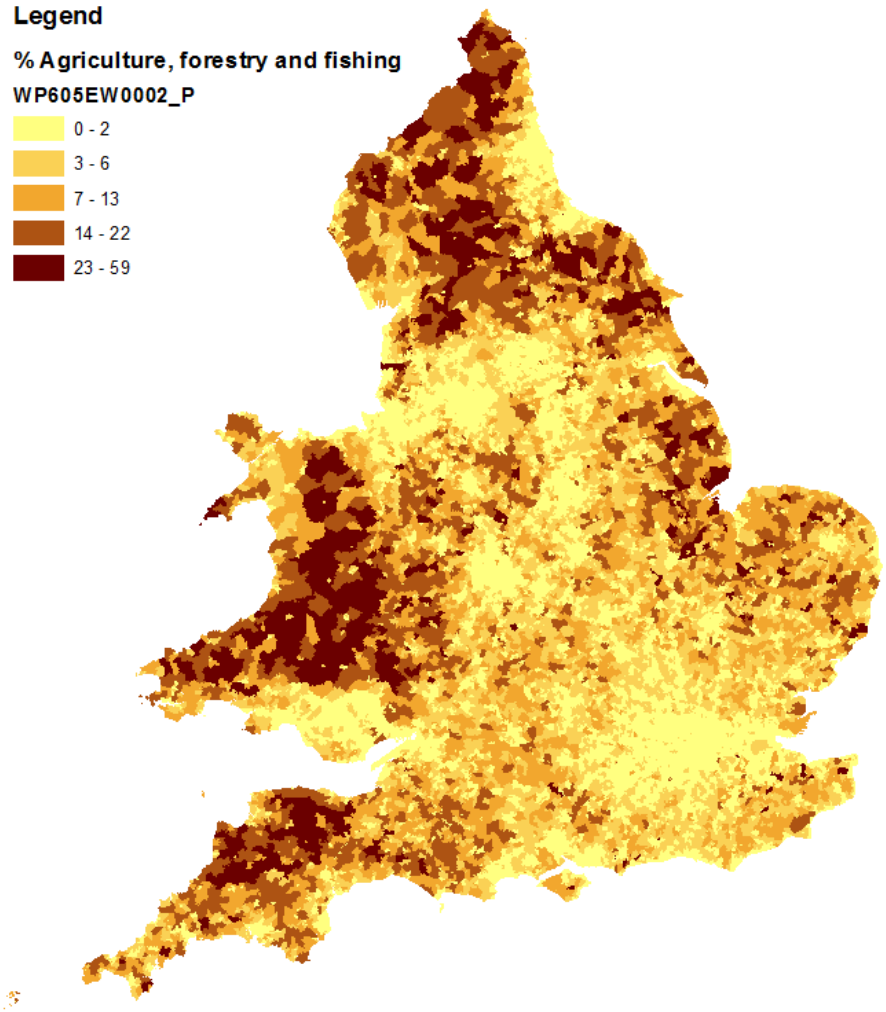
Employment characteristics of workplace population
Employment status (employee, self-employed)
Hours worked (part-time, full-time)
Full-time students

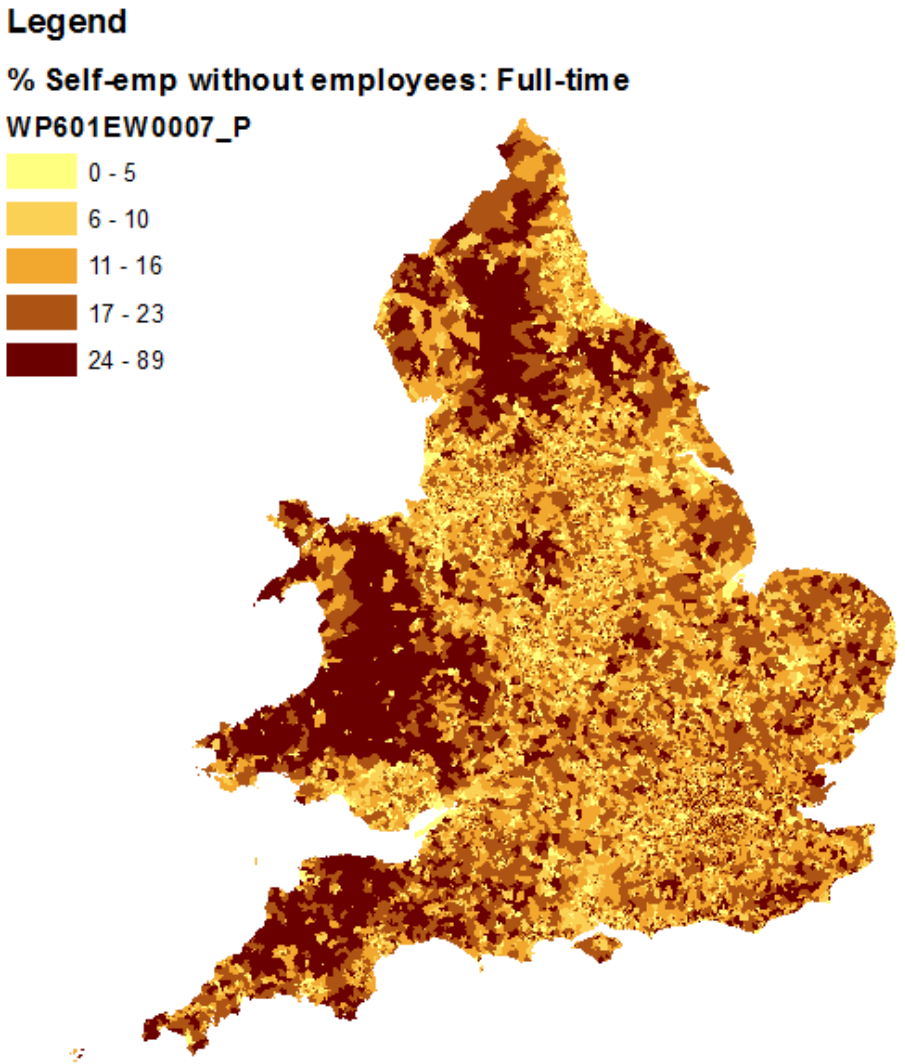
Industry sector
Industry (SIC 2007)

Fascinating new insights …

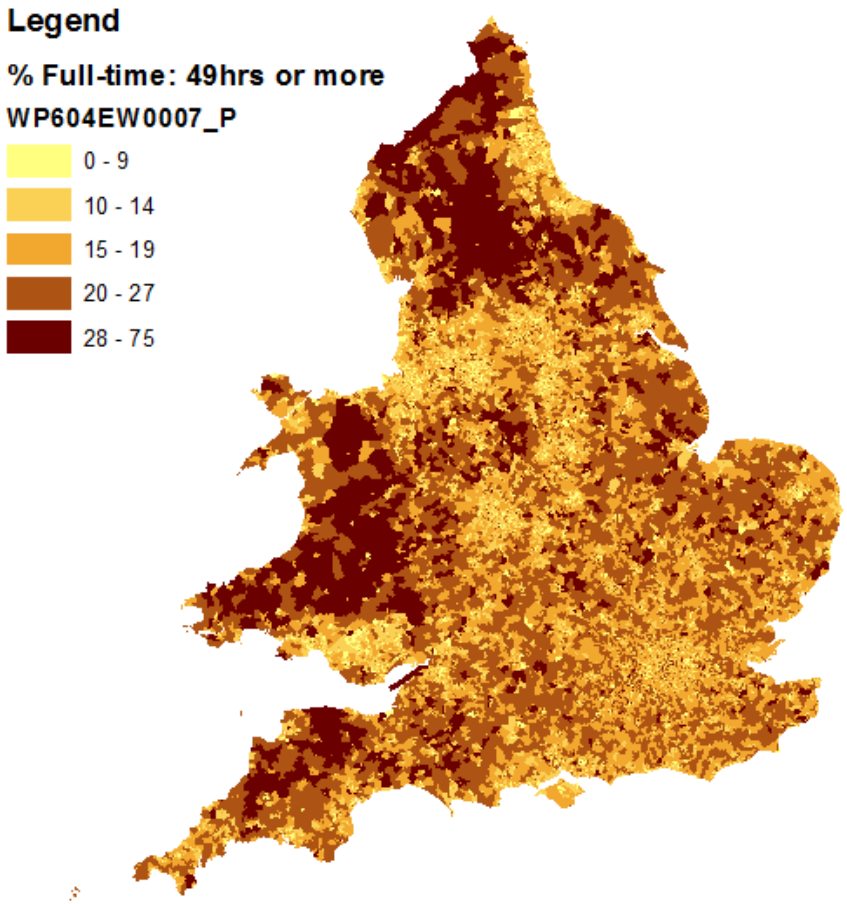


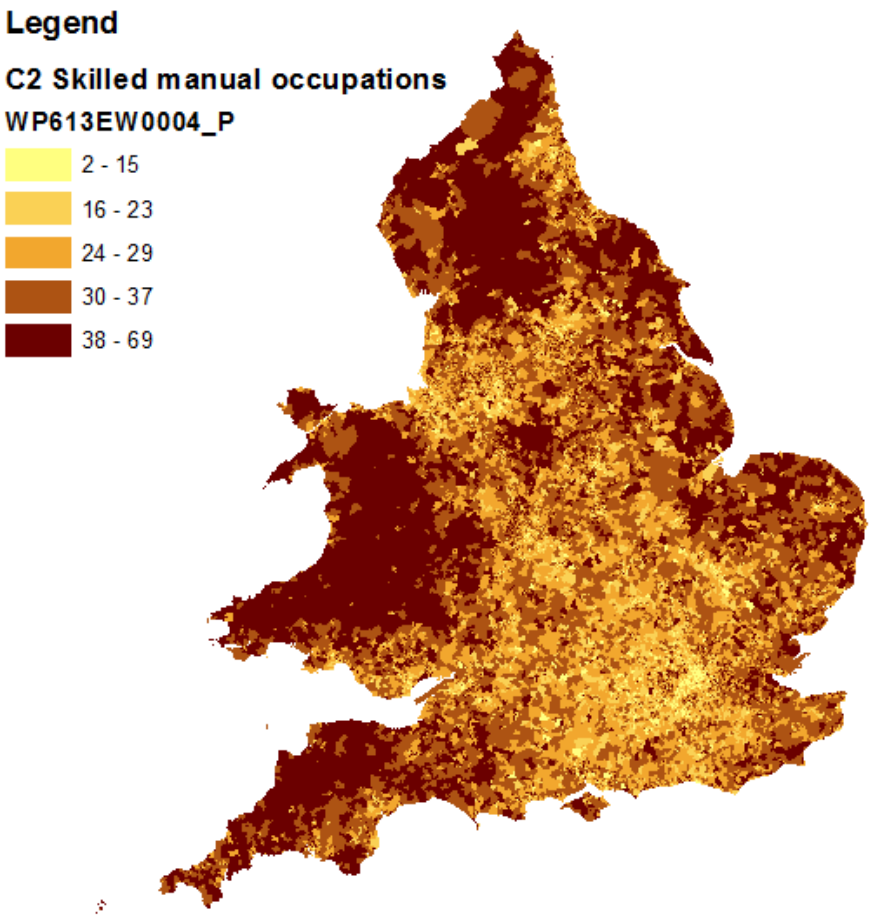
Fascinating new insights …





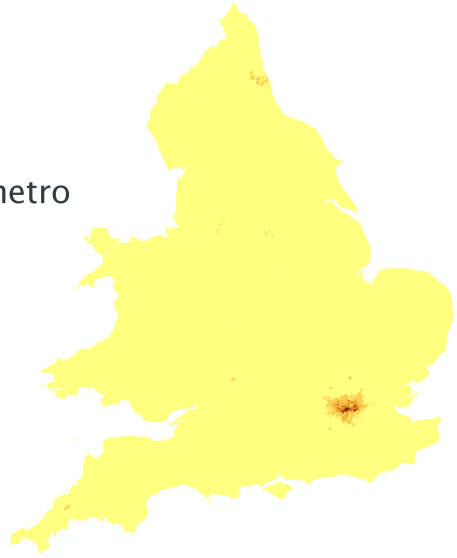
Fascinating new insights …



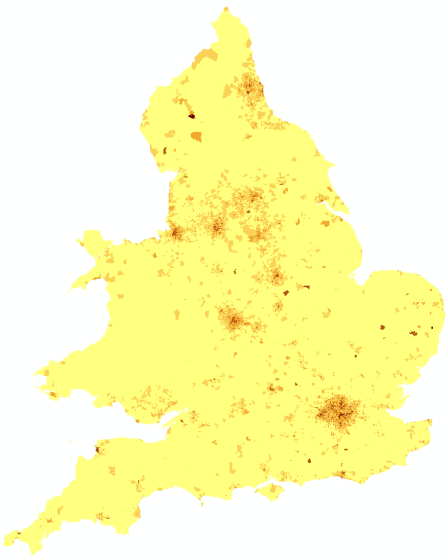


One for you … method of travel to work?

Underground/metro

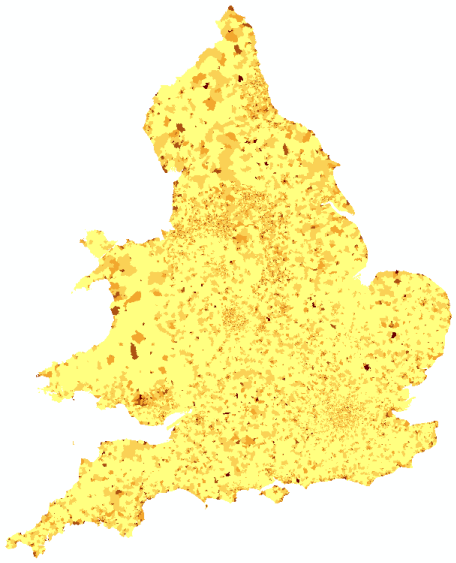


Bus



Driving a car or van

On foot



Some early insights/thoughts …

- New and fascinating insights into statistical and spatial distribution of workplaces/workers
- Much more initial exploratory analysis needed than for OAC: new geography + new data = new patterns!
- Very clear geographical concentrations of workers/workplaces
- Very clear correlations between variables
- Not yet clear how many levels/groups in hierarchy …

What next?

- Produce COWZ!
- QA'd/Released by ONS
- Feedback from users/analysts/WZUG
- WZs for Scotland and N Ireland? UK version of COWZ?
- Consider ways of updating or extending COWZ – 2021 Census; Open Data; integration with other admin sources

References

Martin D, Cockings S, Harfoot A, 2013, Development of a Geographical Framework for Census Workplace Data, *Journal of the Royal Statistical Society, Series A* 176 585-602

Acknowledgements

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Questions, discussion.

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