A Geodemographic Classification of Commuting Flows for England and Wales

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This morning.....

- Why develop a commuting typology?
- Developing the commuting typology
- Some working ideas – examples
- Advantages and limitations of the typology
- Points for discussion

Background to the typology

Objective

To develop a series of flow based classifications of commuting for England and Wales based on origin-destination from the 2011 Census. This will be used to analyse the spatial dynamics of commuting over time.

Research Questions

What method(s) should we use to classify the commuting flows?

How many groups or classes of commuting should there be?

How do we capture specificity and variability in commuting patterns?

What are Geodemographic Classifications?

- "[A] classification of small areas according to their inhabitants"

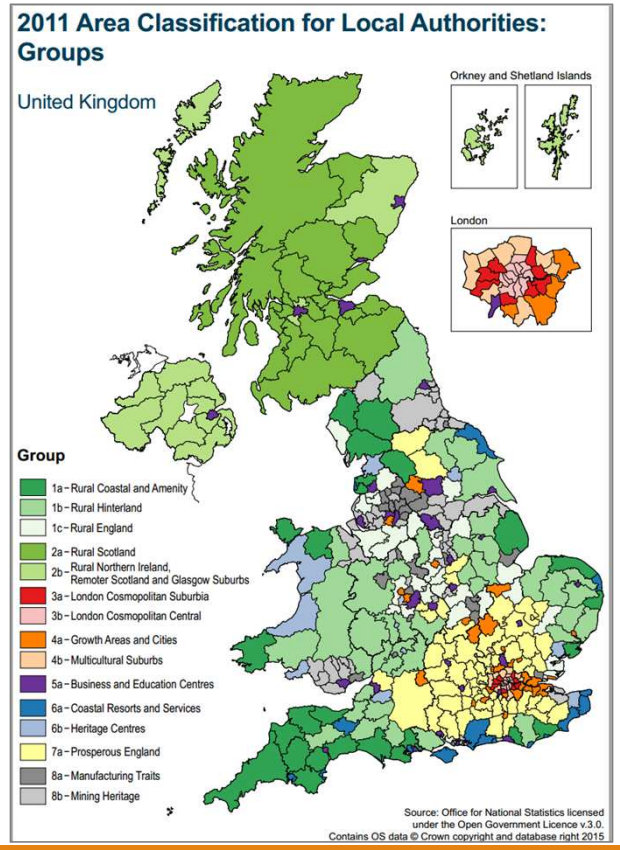
(Rothman, 1989: 1 quoted in Debenham *et al*, 2001: 1)

- In the context of our commuting classification (i.e. flows rather than areas) we might redefine this as a

"..classification of flows based on commuter characteristics"

Why create a commuting flow typology?

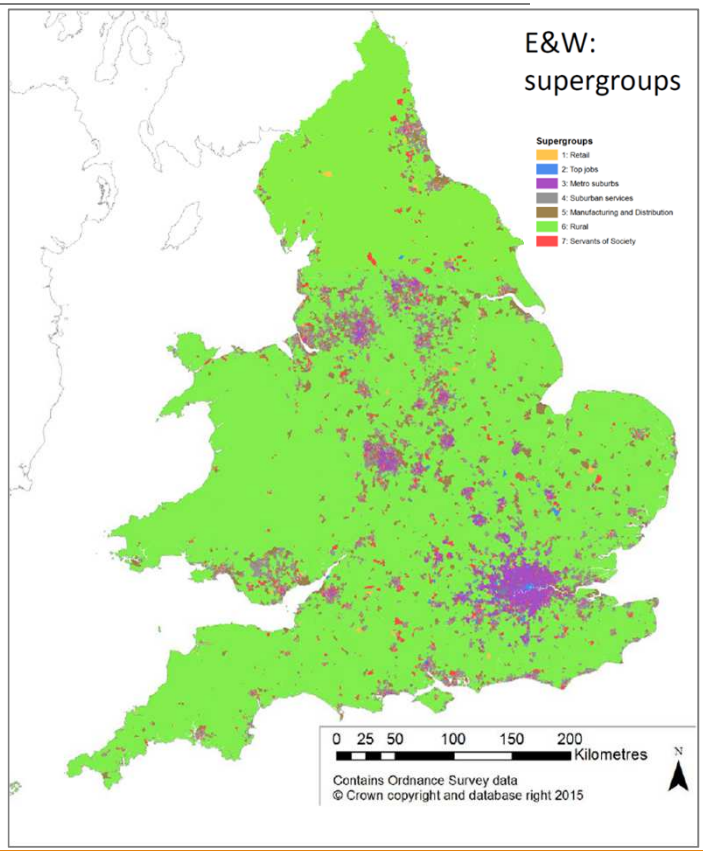
- Various geodemographic classifications
- ‘Official’ and ‘Commercial’
- Usually developed for areas based on residents or households
- ONS Area Classification is one such example
- Produced 1991, 2001 and 2011 Censuses at LA and Sub-LA level



Why create a commuting flow typology?

- New Workplace Zone Classification developed by a team at Southampton University
- Based on workplace as opposed to residential characteristics – new innovation
- See Cockings *et al*, 2015

https://www.ukdataservice.ac.uk/media/455470/cockings.pdf

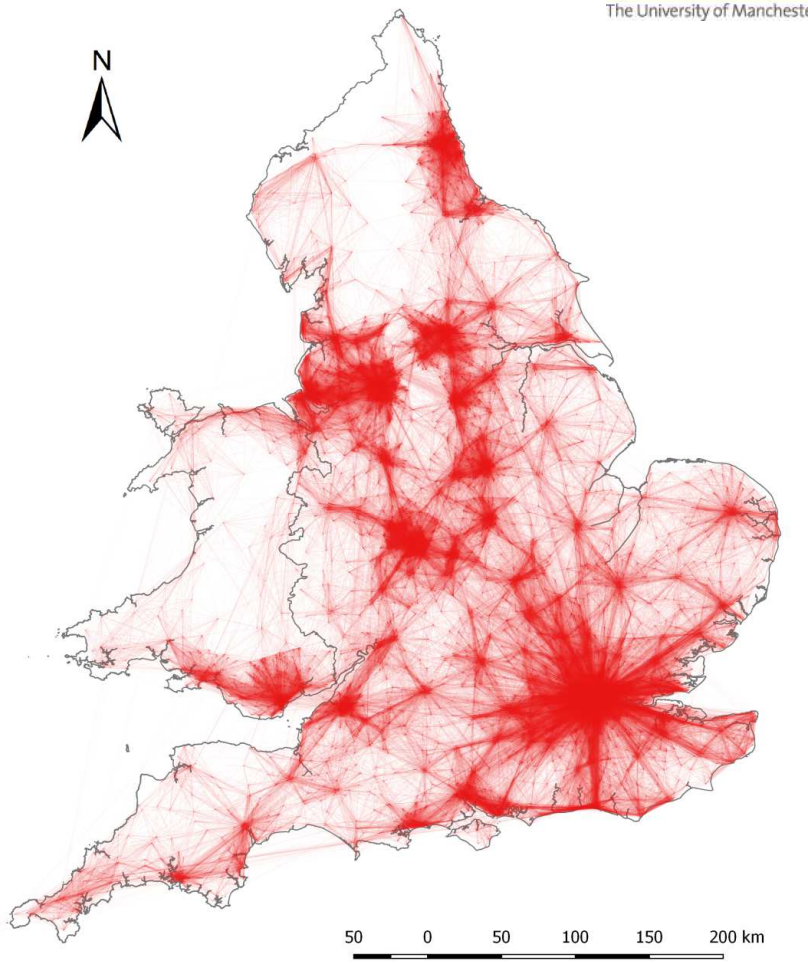


Why create a commuting flow typology?

- No such classification has ever been attempted for commuting flows!
- Challenge of accessing data on diverse commuter characteristics
- 1991 Census - 1/10% samples and limited data characteristics
- 2001 – Better but still relatively limited data on characteristics

2011 Census – Real Opportunity

- 2011 Census
- 11 categories of commuter characteristics
- 89 variables released at MSOA level (LSOA possible with restrictions)
- SCAM but rich and detailed
- For use in transport, planning, infrastructure financing, real estate, industrial location analysis, environmental management…Any others???



2011 Categories and Variables

Category	No of Variables
Sex	2
Age	6
Method of Travel-to-Work	11
Economic Activity	4
NS-Sec	15
Industry	21
Occupation	9
Ethnic Group	6
Family Status	4
Hours Worked	4
Approximated Social Grade	4

Methods

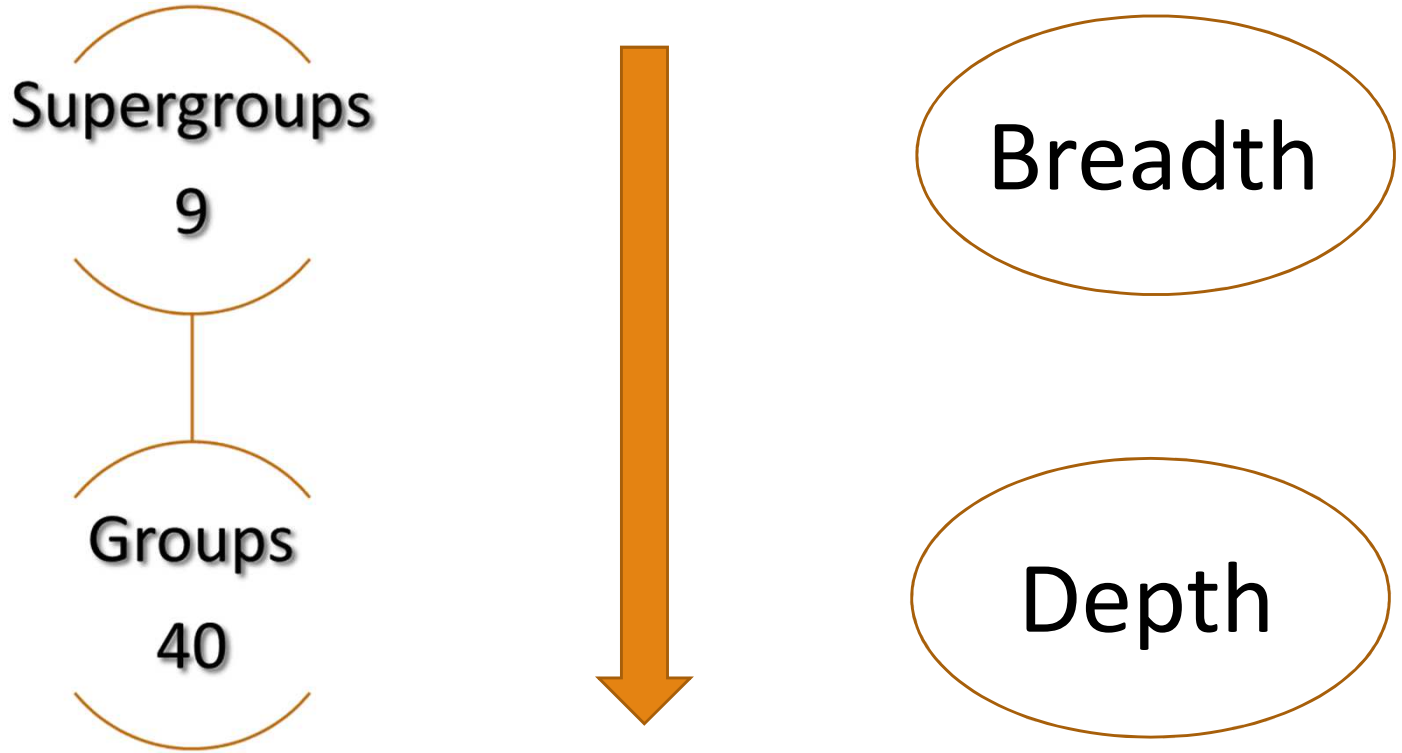
- An approach that is consistent with ‘best practice’ – e.g. ONS OAC approach
- Collect Data from Census Interaction Data Service – 3GB pre-processing – 515,000 flows!

Stage	Background
1. Identify categories to include	Iterative – all categories were included initially – refined through dev.
2. Select variables from each category	Iterative – all variables were included initially – refined through dev.
3. Exploratory processing of variables	Convert all variables to rates (%)
4. Transformation and standardisation of variables	Important for addressing skew and making sure data are comparable Transformation – Proportional Ranking followed by Inverse Distance Standardisation – Range Standardisation
5. Run Clustering	K-means Clustering
6. Evaluate and refine solutions	12 iterations of the classification – refined through dev.

Chosen categories and variables

Category	No of Variables
Sex	Male – Binary (low male, high female)
Age	16-24; 25-34; 35-49; 50-65
Method of Travel-to-Work	Train; bus; car/van; cycle; on foot
Economic Activity	X – captured by 'Hours worked'
NS-Sec	All – Higher Managerial and Admin. through to Routine
Industry	Manufacturing; construction; retail & repair; transport/storage; accommodation and food services; finance; prof, scientific & tech.; Public admin/defence; Education; Health and Social care
Occupation	All – Managers, Directors and Senior Officials through to Elementary occupations
Ethnic Group	White – Binary (low white, high multicultural/non-white)
Family Status	X – Badly behaved variables!
Hours Worked	PT – 15 hours or less; PT – 16-30 hours; FT – 31-48 hours; FT 31-48 hours
Approximated Social Grade	AB; C1; C2; DE

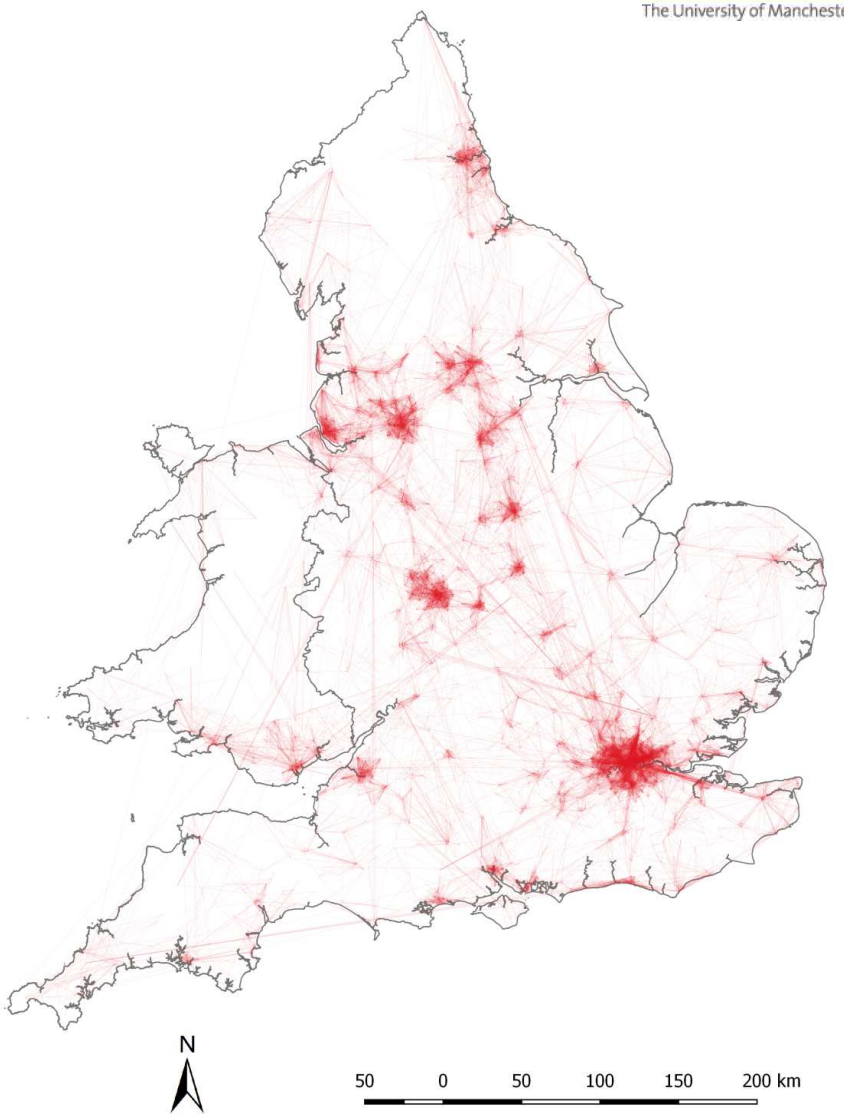
Commuting classification hierarchy



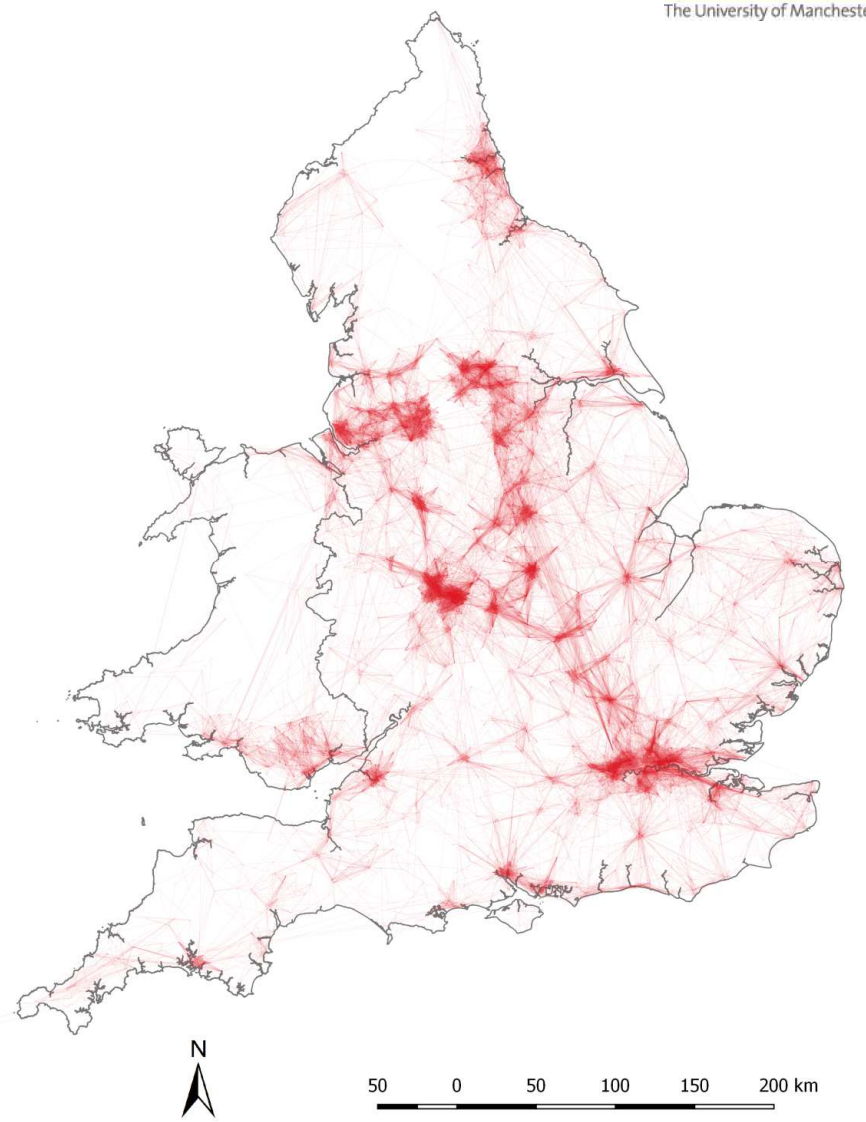
Working version – Supergroup nomenclature

Supergroup Name	No of Nested Groups
1. Consumer Services	5
2. Blue Collar Traits	3
3. Sustainable Sorts	5
4. White Collar Workers	3
5. Serving Society	5
6. The Nurturers	5
7. Traders, Movers and Makers	5
8. High Flyers	5
9. Techs and the City Types	4

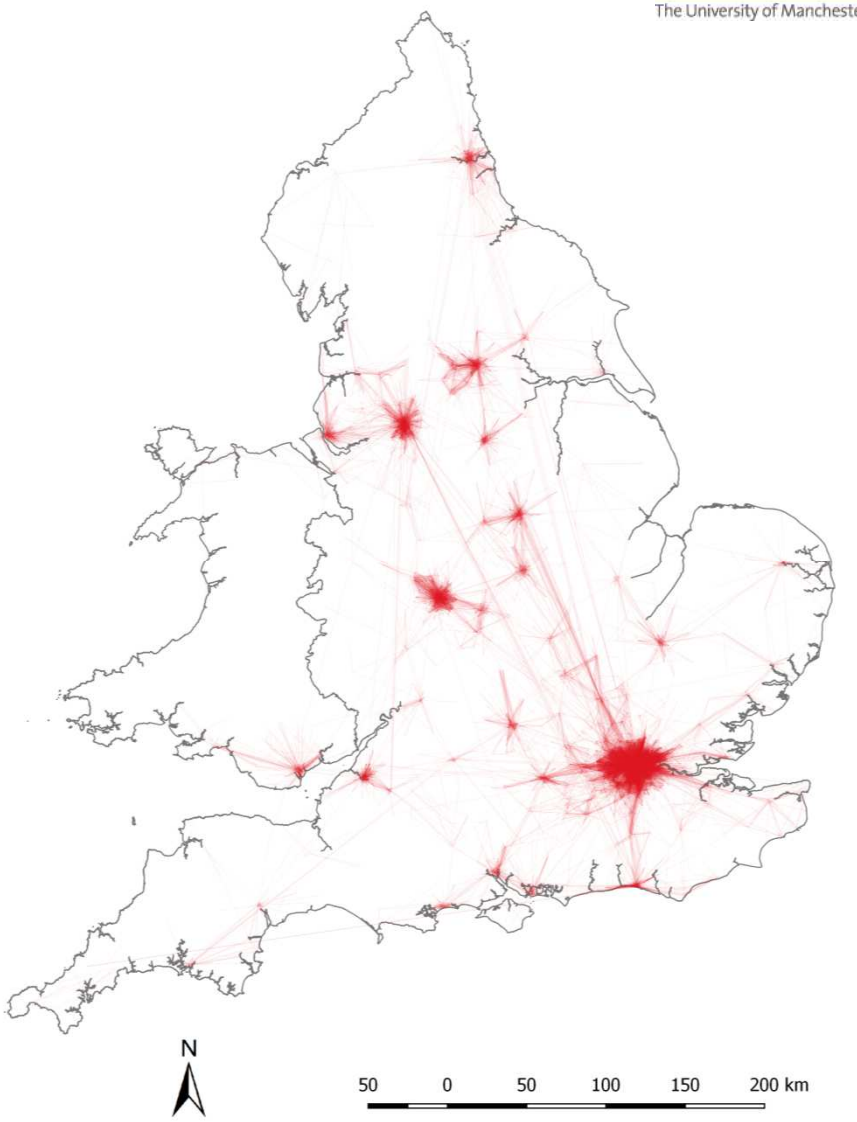
1. Consumer Services



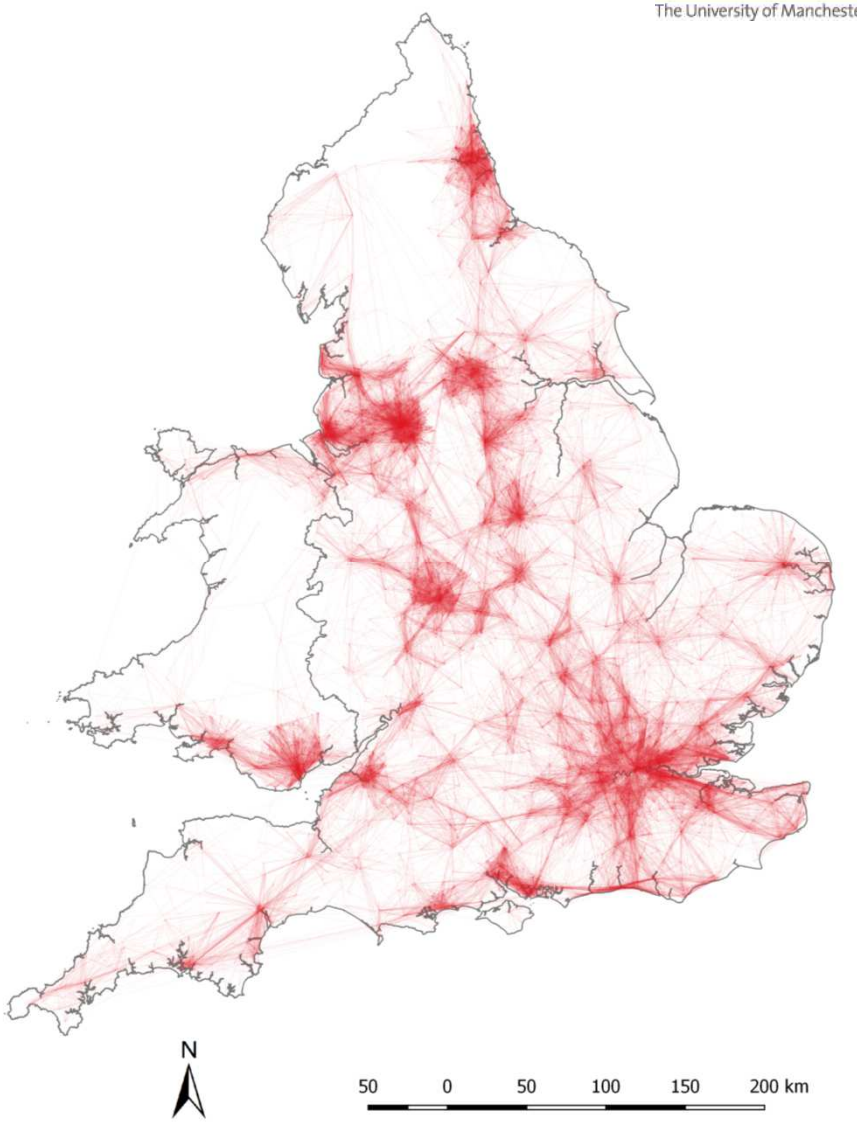
2. Blue Collar Traits



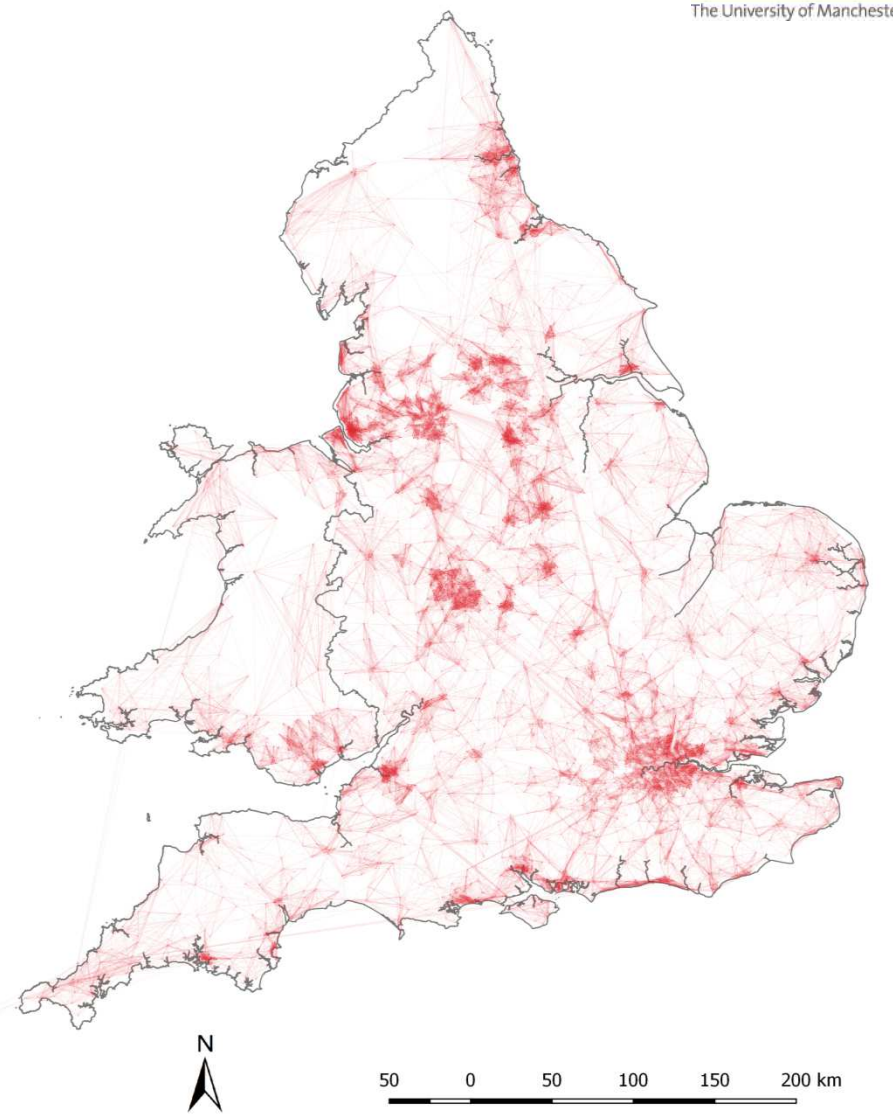
3. Sustainable Sorts



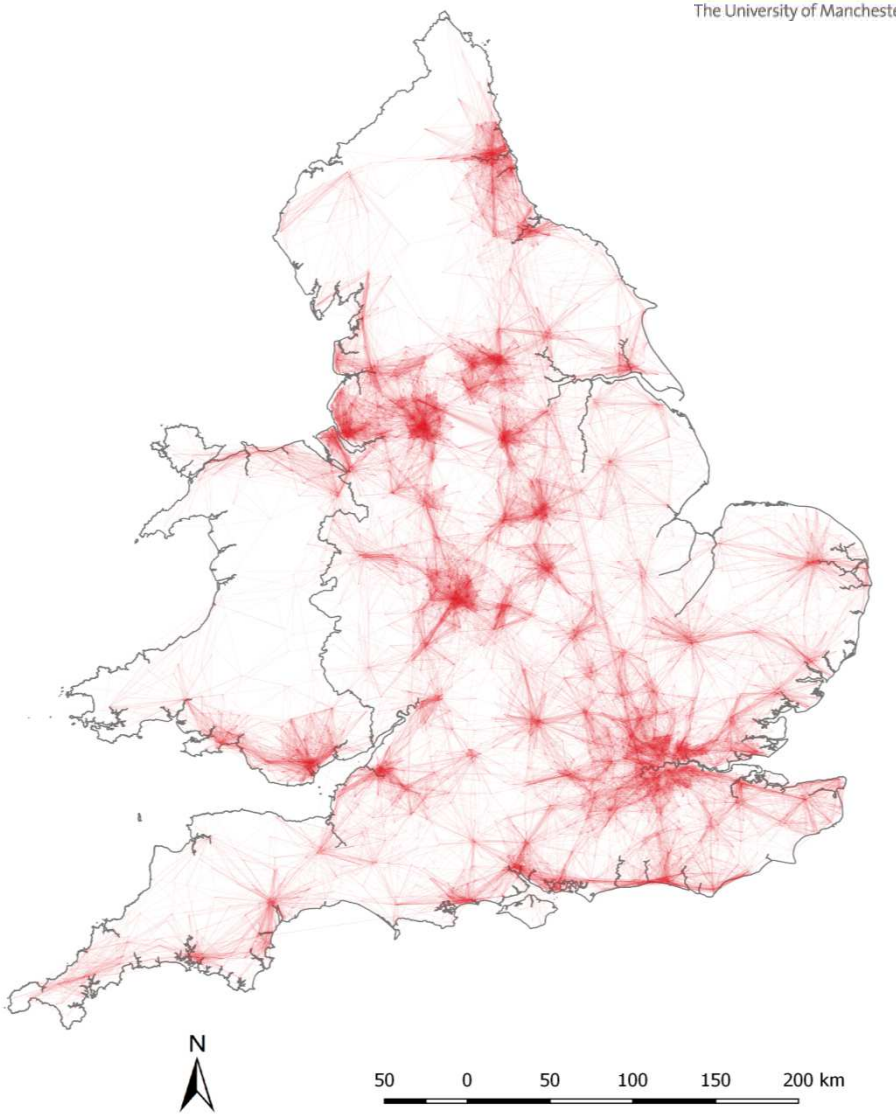
4. White Collar Workers



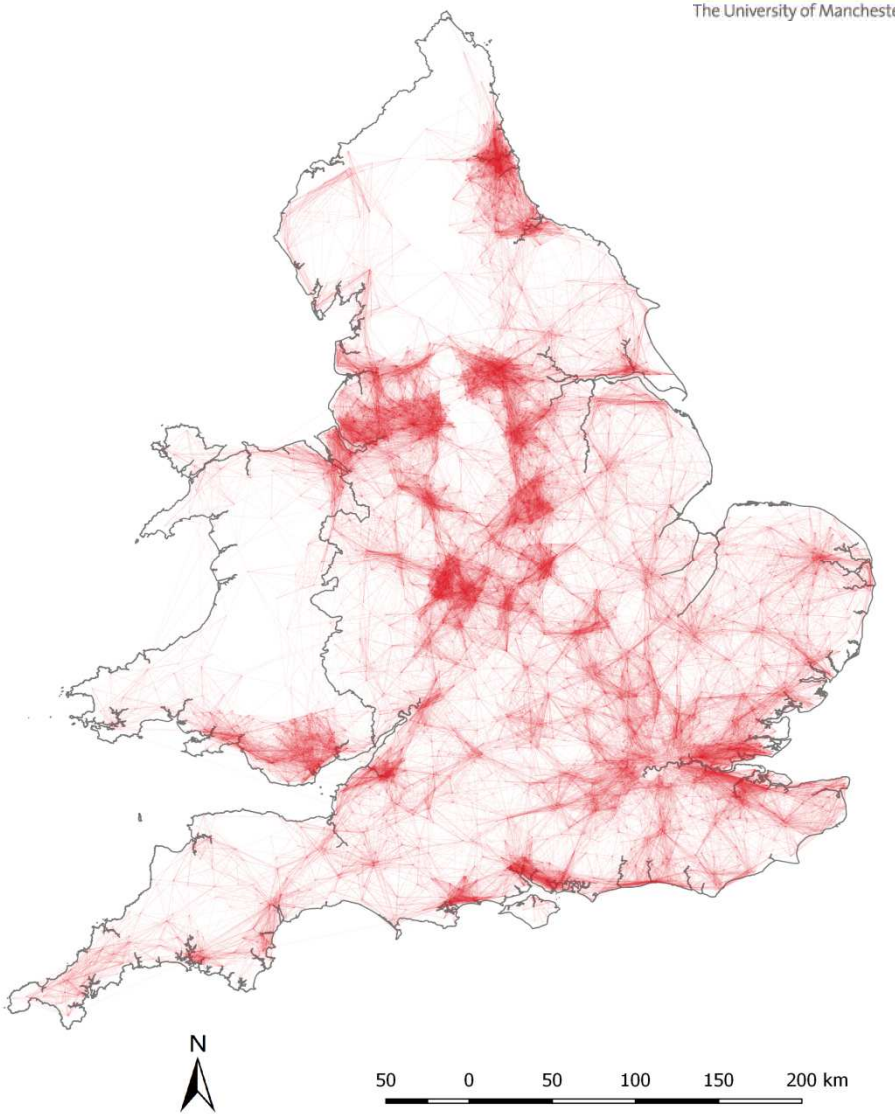
5. Serving Society



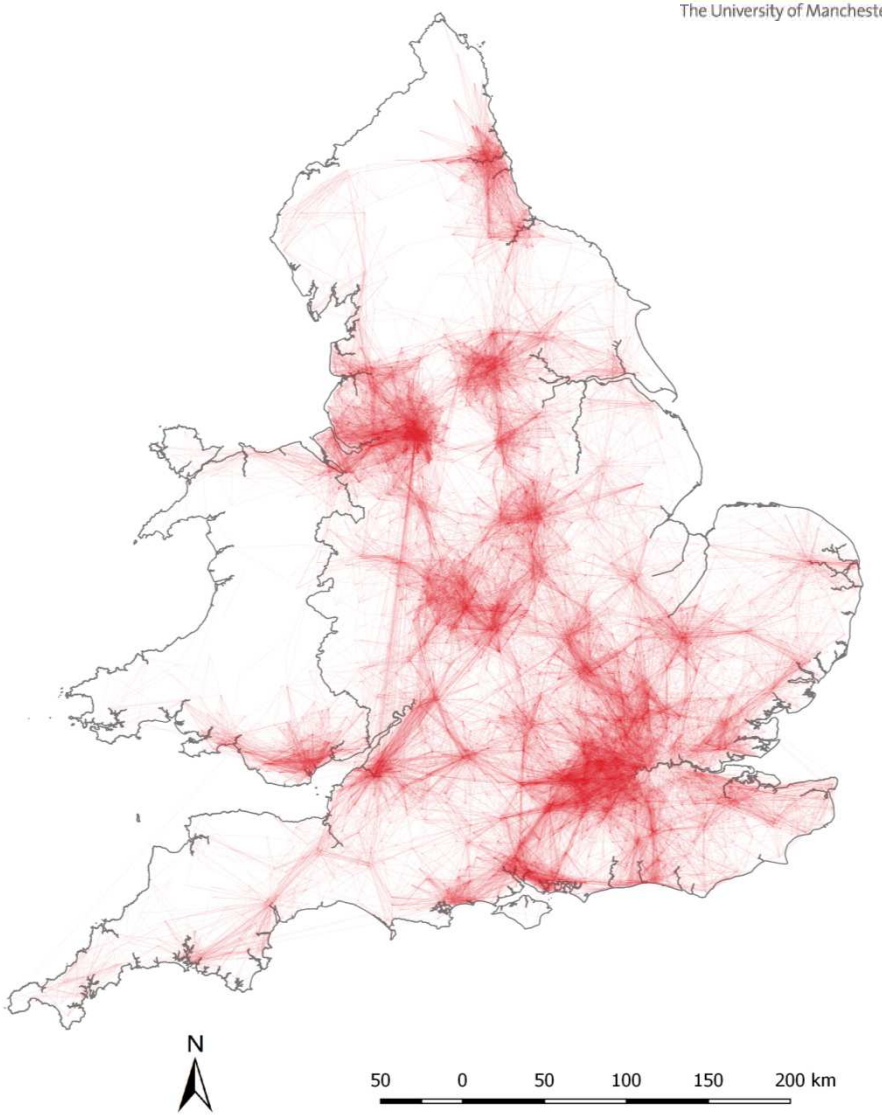
6. The Nurturers



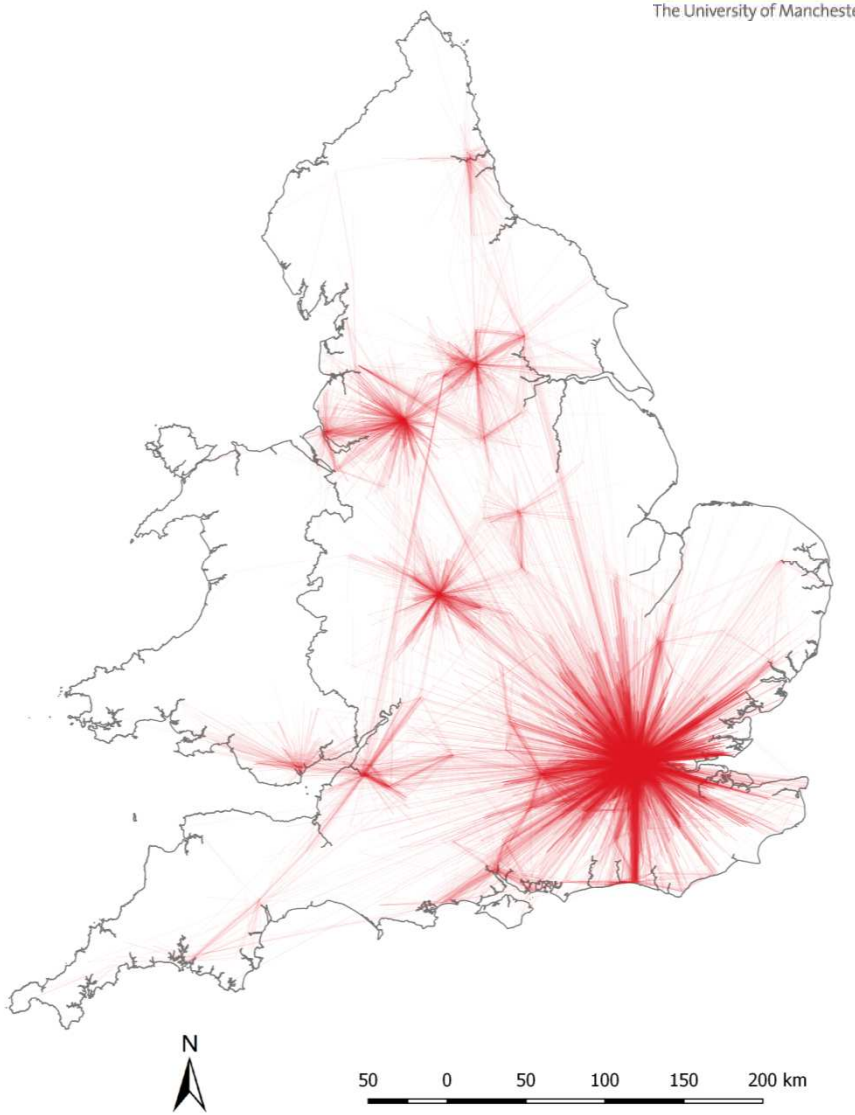
7. Traders, Movers and Makers



8. High Flyers



9. Techs and the City Types



Advantages of the typology

- Snapshot analysis of commuting interactions
- Distinguished by the underlying characteristics of commuters
- Captures cross-border commuting within and between E&W
- Complements the existing suite of area-based classifications
- Provides users with access to data that is ordinarily difficult to use
- User-friendly consolidation of a lot of data
- Policy applications? – One for Cecilia later this morning!

Limitations of the typology

- Usual disclaimers about Census data apply
- Inaccuracies in registration of home and work
- Does not capture home-working, international commuters or second home variations
- Does not include cross-border commuting into Scotland (or Scotland more generally!)
- At this stage – cannot say anything about change in commuting between census periods
- It is weak on agricultural, information and some creative type occupations
- Choice of variables, processing of data and nomenclature development – art and science!

Points for Discussion

- Initial thoughts on what we have done so far!
- I have only focused on the Supergroups in the presentation
- We would also like to focus on three Supergroups, their descriptions and their nested Groups
  - The info here is available in your packs
- Test the nomenclature and the typology more generally