Spatial Analysis of Commuting to Work Patterns in the UK: 2001 and 2011

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Background

• Substantial labour market changes over last decade:
  – City living and working – urban renaissance
  – Feminisation and temporisation of workforce
  – Tertiarisation of economy
• Changes likely to have been accompanied by changes in commuting behaviour and patterns
• Release of 2011 Census data
• Current related policy debates:
  – HS2 (phases 1 and 2)
  – Road building
  – Road pricing
  – Airport expansion
  – Environmental concerns
Research Questions

• What variations exist in commuting to work propensities and modes of travel between different socio-demographic subgroups of the UK population?

• What spatial variations are evident in commuting propensities, modes of travel and distances travelled in different parts of the UK?

• How have commuting behaviours changed between 2001 and 2011 across the UK and what have been the driving forces for the changes that have occurred?
**Aims**

- To investigate how commuting to work behaviour varies by socio-demographic group in the UK (i.e. how does commuting behaviour differ by age, sex, ethnicity, occupation, etc.)
- To investigate how the commuting behaviour of these subgroups varies spatially across the UK
- To use aggregate and micro data from the 2001 and 2011 Censuses to analyse changes in socio-demographic and spatial commuting behaviour over the ten year period
Objectives 1

• To examine uni-variate indicators of commuting behaviour at the national level and investigate spatial variations in the commuting indicators for administrative (LAD) and functional (TTWA) regions

• To identify and explain the changes in commuting indicators between 2001 and 2011

• To identify the geography of second homes for work reasons and its relationship with first homes in 2011
Objectives 2

• To use multi-variate models to examine the household and multi-level area characteristics of commuters using the SARs micro data
• To model sub-group commuting patterns for labour market areas at ward/SOA level in Yorkshire and the Humber with particular focus on the frictional effect of distance
• To investigate the policy implications of the research and ultimately draw out and present some policy suggestions
Key Findings: Literature Review

• Very little work related to:
  – comprehensive analysis of spatial and socio-demographic variations in commuting propensities and patterns
  – the relationship between commuting and migration
  – how recent changes in urban form have created new patterns of commuting

• Using the 2011 Census to:
  – examine the changes in commuting propensities and patterns in the UK between 2001 and 2011
  – investigate the relationship between the usage of second homes and commuting propensities and patterns
Data Review: Attribute Data

• Five main census-related datasets:
  – Aggregate statistics
  – Interaction data (SWS and STS)
  – Micro-data (SAR, SAM and CAMS)
  – Longitudinal studies
  – Commissioned tables

• Non-censal data sources:
  – National Transport Survey
  – Local Authorities and Passenger Transport Executives
  – Commercial data
Data Review: Boundary Data

• Census Geographies:
  – Boundary changes at district and ward level between 2001 and 2011 in parts of England
  – District level changes due to the 2009 structural changes to local government in England
  – Necessary to aggregate 2001 districts up into 2011 districts
  – Variety of ward boundary changes - not possible to aggregate 2001 wards up into 2011 wards

• Travel to Work Areas:
  – 2011 TTWAs to be developed in 2013/14
Commuting Definitions and Census Questions

• Dictionary Definition (Oxford Dictionary, 2012):
  • “a person who travels some distance to work on a regular basis”

• Census Questions (2001 and 2011)
  – England, Wales and Northern Ireland:
    • “In your main job, what is the address of your workplace?”
    • “How do you usually travel to work?”
  – Scotland:
    • “What address do you travel to for your main job or course of study (including school)?”
    • “How do you usually travel to your main place of work or study (including school)?”

• Able to analyse both commute distance and method of travel used for commuting
Commuting Definitions: Problems

• Appropriate denominator?
  – Total population
  – Population aged 16+
  – Population aged 16-74 or 16-64
  – Economically active population
  – Employed population

• Official commuting data only captures individuals in formal employment

• Fails to capture people not in formal employment, such as carers
Homeworking: 2001 and 2011

• Change in operationalization of homeworking data between 2001 and 2011:
  – 2001: if someone indicated they were working at/from home, they were categorised as such
  – 2011: if someone also indicated a mode of travel they were categorised under that mode

• 2011 QS701 not comparable with 2001 KS015

• Release of comparable 2011 CT0015

• Consequently: possible to analyse commuting propensities of people working from home and people working at home
Preliminary Data Analysis

Commuting Intensities
Modal Splits
Second Address Usage
## England and Wales Commuting Overview: Numbers and Rates

<table>
<thead>
<tr>
<th>English Government Office Region (GOR)</th>
<th>2011 No. of Commuters</th>
<th>% Change 2001-11</th>
<th>2001 Commuting Rate* (%)</th>
<th>2011 Commuting Rate* (%)</th>
<th>% Point Change 2001-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>England and Wales</td>
<td>26,526,336</td>
<td>+12.3</td>
<td>62.8</td>
<td>64.5</td>
<td>+1.7</td>
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<td>England</td>
<td>25,162,721</td>
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<td>63.2</td>
<td>64.7</td>
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<td>Wales</td>
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<td>57.2</td>
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<td>North East</td>
<td>1,152,970</td>
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<td>56.4</td>
<td>59.9</td>
<td>+3.5</td>
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<td>North West</td>
<td>3,228,744</td>
<td>+11.3</td>
<td>59.9</td>
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<td>Yorkshire and The Humber</td>
<td>2,428,074</td>
<td>+11.2</td>
<td>61.1</td>
<td>62.7</td>
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<td>East Midlands</td>
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<td>West Midlands</td>
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<td>South East</td>
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<td>67.4</td>
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<tr>
<td>South West</td>
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<td>64.7</td>
<td>66.4</td>
<td>+1.7</td>
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<td>London</td>
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<td>+20.5</td>
<td>62.6</td>
<td>65.4</td>
<td>+2.8</td>
</tr>
</tbody>
</table>

*Number of commuters as a percentage of population aged 16-74

Data sources: InFuse and ONS (Tables KS015 and CT0015).
Changes in Commuting Intensities across England and Wales

Commuters in GOR who commute in any way as a percentage of GOR population aged 16-74 in 2011

Legend
GOR Commuting Intensities (2011)
Commuters as % pop aged 16-74

< 61%
61% - 63%
63% - 65%
65% - 67%
> 67%

Percentage point change in the commuting rate of GOR between 2001 and 2011

Legend
GOR Commuting Intensity Changes
% point change (2001-2011)

< +0.5
+0.5 - +1
+1 - +2
+2 - +3
> +3

Boundary data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Commuting Intensities across England and Wales, 2001 and 2011

Commuters in LAD who commute in any way as a percentage of LAD population aged 16-74 in 2001

Commuters in LAD who commute in any way as a percentage of LAD population aged 16-74 in 2011

Boundary data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Main changes:

- **16% increase** in the share of employees working mainly at or from home
- **22% increase** in the share of employees commuting to work by train
- **3% decrease** in the share of employees commuting to work by bus
- **2% decrease** in the share of employees commuting to work by driving a car
- **21% decrease** in the share of employees commuting to work as a passenger in a car

Data sources: InFuse and ONS
(Tables KS015 and CT0015)
Commuters in LAD who work mainly at or from home as a % of all commuters in LAD aged 16-74

Boundary data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Commuting Intensities: Working At Home vs. Working From Home

Homeworkers in LAD who work at home as a % of all commuters in LAD aged 16-74 (CT0045)

Homeworkers in LAD who work from home as a % of all commuters in LAD aged 16-74 (CT0015 – CT0045)

Boundary data source: UKBorders. Attribute data sources: ONS (Tables CT0045 and CT0015).
Commuting by Car Driving in England and Wales, 2001 and 2011

Commuters in LAD who commute to work by driving a car as a % of all commuters in LAD aged 16-74

Boundary data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Commuting by Bus in England and Wales, 2001 and 2011

Commuters in LAD who commute to work by bus as a % of all commuters in LAD aged 16-74

Legend
GORs

Bus Commuting by District
% of commuters aged 16-74

< 2%
2% - 4%
4% - 6%
6% - 8%
> 8%

Commute data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Commuting to Work by Train in England and Wales, 2001 and 2011

Commuters in LAD who commute to work by train as a % of all commuters in LAD aged 16-74

Legend
GORs
Train Commuting by District
% of commuters aged 16-75

- < 1%
- 1% - 3%
- 3% - 5%
- 5% - 7%
- > 7%

Boundary data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Walking and Cycling to Work in England and Wales, 2001 and 2011

Commuters in LAD who walk or cycle to work as a % of all commuters in LAD aged 16-74

Legend
GORs
Commuting by Foot/Bike by District
% of commuters aged 16-74

< 8%
8% - 12%
12% - 16%
16% - 20%
> 20%

Boundary data source: UKBorders. Attribute data sources: InFuse and ONS (Tables KS015 and CT0015).
Second Addresses for Work Purposes

• New questions in 2011 Census
  – England and Wales:
    • “Do you stay at another address for more than 30 days a year?”
    • “What is that address?”
      – “Armed forces base address”
      – “Another address when working away from home”
      – “Student’s home address”
      – “Student’s term time address”
      – “Another parent or guardian’s address”
      – “Holiday home”
      – “Other”

• Possibly able to analyse the relationships between the use and locations of second addresses for work purposes and commuting behaviour/patterns
Residents of LAD who use a second address elsewhere for work as a percentage of LAD population

Residents of elsewhere who use a second address in LAD for work as a percentage of LAD population

Boundary data source: UKBorders. Attribute data sources: CDU.
Conclusions (so far)

• Lack of previous comprehensive research
• Lots of relevant data becoming available
• Given current public policy debates, there is a need for an up-to-date understanding of commuting propensities and patterns in the UK
• Substantial spatial variations in commuting propensities and patterns at the aggregate level
• There are some interesting and controversial trends in commuting behaviour and second home ownership patterns that need to be investigated
Next: Commuting and Sociodemographics

• Variations in commuting propensities and patterns by:
  – Sociodemographic characteristics:
    • Age; Sex; Ethnicity
  – Socioeconomic characteristics:
    • Socioeconomic group; Occupation and Industry
  – Personal circumstances:
    • Household structure; Childcare and Caring responsibilities

• How have these variations in commuting propensities and patterns changed between 2001 and 2011?
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