Developing a classification of workplace zones (COWZ)

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Geography and Environment, University of Southampton

Society for Location Analysis, London, 9 September 2014
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

UCL DEPARTMENT OF GEOGRAPHY

OAC Supergrroup
- Blue Collar Communities
- City Living
- Countryside
- Prospering Suburbs
- Constrained by Circumstances
- Typical Traits
- Multicultural

OAC Supergrroups
Produced by Chris Gale.
UCL Department of Geography.
Boundary data copyright of the Crown.
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
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**

<table>
<thead>
<tr>
<th>2001: OAs</th>
<th>2011: WZs</th>
<th>2011: WZs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Population density</td>
<td>Welsh language skills * 2</td>
</tr>
<tr>
<td>NS-SeC</td>
<td>Sex by single year of age</td>
<td>Religion</td>
</tr>
<tr>
<td>Approximated social grade</td>
<td>Ethnic group</td>
<td>Passports held</td>
</tr>
<tr>
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<td>Country of birth</td>
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<td>Tenure – people</td>
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</tr>
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</tbody>
</table>
A ‘better’ geography for mapping/analysis

2011 Output Areas
A ‘better’ geography for mapping/analysis

2011 Workplace Zones
### 2011 WZs: (N = 53,578)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workplace population</td>
<td>101-11,985</td>
<td>493</td>
</tr>
<tr>
<td>Workplace postcodes</td>
<td>3-113</td>
<td>22</td>
</tr>
</tbody>
</table>

**Legend**

- **Split**
- **Unchanged**
- **Merged**

![Map of England showing the origins of 2011 WZs](image)
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

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### Key dimensions: proposed

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
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<tbody>
<tr>
<td>Demographic structure of workplace population</td>
<td></td>
</tr>
<tr>
<td>Structure and composition of built environment</td>
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<tr>
<td>Socio-economic characteristics of workplace population</td>
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<tr>
<td>Employment characteristics of workplace population</td>
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</tr>
<tr>
<td>Industry sector</td>
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</table>
## 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

<table>
<thead>
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<tr>
<td>Education (highest level of qualification)</td>
</tr>
<tr>
<td>Social grade/social class/occupation (ASG, NS-SeC)</td>
</tr>
<tr>
<td>Travel to work (method, distance travelled)</td>
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</tbody>
</table>

### Employment characteristics of workplace population

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<tbody>
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<td>Employment status (employee, self-employed)</td>
</tr>
<tr>
<td>Hours worked (part-time, full-time)</td>
</tr>
<tr>
<td>Full-time students</td>
</tr>
</tbody>
</table>

### Industry sector

<table>
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</thead>
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</table>
Fascinating new insights ...
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Fascinating new insights ...

Legend
% Full-time: 49hrs or more
WP604EW0007_P
- 9
10 - 14
15 - 19
20 - 27
28 - 75

Legend
C2 Skilled manual occupations
WP613EW0004_P
2 - 15
16 - 23
24 - 29
30 - 37
38 - 69
One for you … method of travel to work?
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


Acknowledgements

Questions, discussion.
Contact

s.cockings@soton.ac.uk
Tel: 023 8059 5519
http://www.southampton.ac.uk/geography/about/staff/sc19.page?