

Commuting to Cambridge: Census data backs the case for rail

The 2011 Census gathered data travel to work data by asking for the workplace address. The results are published showing commuting patterns between specified areas down to a resolution (for the 2011 Super Output Areas - Mid Layer) of a few thousand people. 13 such areas cover Cambridge, and typically two cover towns such as Ely, Newmarket, Royston and Saffron Walden.

This document looks at general commuting patterns for Cambridge, then looks in more detail at the market towns of Ely, Newmarket, Royston and Saffron Walden, all of which are of similar size and similar distance to Cambridge, but have significantly different travel patterns.

The census data analysed below shows:

- **there is a strong correlation between the proportion of people choosing commute to Cambridge by train and the frequency of the rail service**
- **Newmarket in particular would greatly benefit from additional peak period trains, followed by March and Royston**
- **the frequent service between Downham Market, Littleport, Ely and Cambridge shows what can be achieved, although this is suffering overcrowding due to its success**
- **Haverhill is larger than Ely and a similar distance from Cambridge but has significantly fewer people commuting by public transport. A reopened railway could be expected to carry significant numbers of rail passengers**

These enhancements form part of Railfuture East Anglia's submission to the Cambridge City Deal. It demonstrates how Rail can contribute to the objective of easing congestion in Cambridge and linking people to jobs.

More information is available here:

www.railfuture.org.uk/East+Anglia+Cambridge+City+Deal

The figures in this report are based in the 2011 census and the existing rail network. The new station at Cambridge North (for Science and Business Parks and Chesterton) and proposed new station at Addenbrook's further transform the appeal of rail pushing these figures significantly higher.

Cambridge Commuting

The following table is a summary of results for the main forms of transport used for commuting to and from Cambridge. 84903 people work in Cambridge of which 3717 arrive by rail (not including students to the many schools and colleges in Cambridge). The Cambridge to Cambridge column in the table is the subset of people who both live and work in Cambridge, totaling 33704 people or which almost half cycle to work. 51199 people (84903 – 33704) travel from outside the city.

In the reverse direction, 49750 people live in the city, but commute to jobs outside. Some of these are close to Cambridge, for example Granta Park and The Genome Campus to the south, and Histon Business Park and Cambridge Research Park to the north. There are also a significant number of people who commute to London.

The rail commuters in this table total 6262. Assuming around 220 workdays, and someone arriving and departing from the station every day, this would equate to 2.8 million (6262 x 220 x 2) entrances and exits a year, which is 34% of the station's annual footfall of 8,245,416 in 2011. The station footfall has grown 19% since to 9,824,859 in 2014 (www.railfuture.org.uk/east/rail-east/RailEast-Issue-165-February-2015.pdf).

Mode	All to Cambridge	Cambridge to Cambridge	Cambridge to All
All	84903	33704	49750
Rail	3717		2545
Bus	7193	2557	3641
Driving	42402	7478	16258
Passenger	3320	852	1451
Bicycle	18409	14572	16672
Foot	8564	7642	8406

Commuting from Ely, Newmarket, Royston and Saffron Walden to Cambridge

The following table focuses on the travel patterns from the Market Towns of Ely, Newmarket, Saffron Walden and Royston. This shows that the number of people travelling to Cambridge by rail is significantly larger for Ely (825) compared to the other towns (33, 67 and 166). At the end of the table is the percentage of commuters travelling by rail to Cambridge, 41% in the case of Ely. Royston is lower, but Newmarket has a very low value of 3%.

Saffron Walden was only 9% in 2011 but there has been growth in commuting on this route since 2011, with initiatives such as through ticketing onto buses, renaming of the station to "Audley End for Saffron Walden" and a start to the construction of a cycle route from the town to the station in 2015, all making (this out of town) the railway station, which is 1.3 miles from the town centre, more attractive to passengers.

	Ely to Cambridge	Newmarket to Cambridge	Saffron Walden to Cambridge	Royston to Cambridge
Mode: All	1994	1177	774	796
Mode: Rail	825	33	67	166
Mode: Bus	53	133	28	29
Mode: Driving	964	911	636	550
Mode: Passenger	88	67	24	33
% by Rail	41%	3%	9%	21%
% by Public Transport	44%	14%	12%	24%
Population	20256	20384	14313	15781
Distance from Cambridge (miles)	15.28	15.04	14	13
Cambridge arrivals 0745 to 0845	6	1	3	2
Station footfall 2011	1,731,956	197,924	746,746	1,193,950
Station footfall 2014	1,976,134	285,062	838,804	1,300,508
Growth in 3 years	14%	44%	12%	9%

So what could explain the contrast between the figures for Ely and Newmarket? The table also gives from key statistics for each of these journeys. This shows that:

- the populations and commuting distances are similar
- the peak hour rail service is dramatically different for each place, mapping reasonably closely to the usage, with Ely at 6 trains an hour, down to Newmarket's 1 train (despite this poor service, Newmarket has seen very strong growth in the 3 years since 2011)

Another influence could be how road journeys from Ely and Newmarket to Cambridge compare. The Off-Peak travel times by road are only a few minutes different so it is unlikely to explain the significant difference.

It seems clear that improving the rail service from Newmarket from a single overcrowded train in the peak hour to multiple trains has the potential for shifting large numbers of people to the rail network; if Newmarket was to achieve Ely's 41% of commuters travelling by train then this would equate to almost 500 people, an increase of over 400 on the existing figure.

Commuting from Littleport, Downham Market and March to Cambridge

Taking 3 places further out from Cambridge, the data for people commuting to Cambridge is given in the table below. Littleport has 540 people commuting to Cambridge with rail having a 28% share. Downham Market has a much smaller number of commuters, but rail achieves a high share with 67% using the train. March is twice the size of Downham Market and the same distance from Cambridge, but has less people using rail to commute, with only 20% using the train.

Again there appears to be a strong correlation between the proportion of people choosing to commute by train and the frequency of the rail service. Downham Market has 3 times the train frequency, and has 3 times the market share compared to March.

	Littleport to Cambridge	Downham Market to Cambridge	March to Cambridge
Mode: All	540	110	260
Mode: Rail	149	74	51
Mode: Bus	13	0	15
Mode: Driving	318	31	170
Mode: Passenger	38	3	14
% by Rail	28%	67%	20%
% by Public Transport	30%	67%	25%
Population	8738	9994	19042
Distance from Cambridge (miles)	21.3	30.5	30.85
Cambridge arrivals 0745 to 0845	2	3	1
Station footfall 2011	178,254	406,690	316,292
Station footfall 2014	225,024	460,056	357,864
Growth in 3 years	26%	13%	13%

Commuting from Haverhill to Cambridge

The railway from Haverhill to Cambridge is currently closed, with bus taking 25% of commuters. Haverhill is larger than Ely, and only slightly further from Cambridge, so it would not be unrealistic to assume that a reopened railway could transport equal or in excess of Ely's 825 rail commuters. There are many jobs located around the station and within walking distance of the station in the city centre, so large numbers of people walk from the station to their place of work.

	Haverhill to Cambridge
Mode: All	1708
Mode: Bus	423
Mode: Car	1120
Mode: Passenger	119
% by Bus	25%
Population	27,041
Distance from Cambridge (miles)	18.6

Cost of travel and access

The table below shows annual and weekly season ticket prices, and the cost per mile for the weekly season assuming it is used for 5 return journeys. The costs per mile are broadly similar (ranging from 17p to 25p per mile).

	Annual	Weekly	Distance	Pence per mile
Newmarket	£1,336.00	£33.40	15.04	22
Ely	£1,184.00	£29.60	15.28	19
Audley End	£1,396.00	£34.90	14	25
Royston	£1,324.00	£33.10	13	25
Littleport	£1,580.00	£39.50	21.3	19
Downham Market	£2,048.00	£51.20	30.5	17
March	£2,600.00	£65.00	30.85	21

The parking charges vary more, from free but very limited at Newmarket, through to £6.80 per day (based on the weekly season) for Audley End with its large station car park.

	Annual parking	Weekly Parking	Parking spaces	Cycle spaces
Newmarket	Free	Free	12	11
Ely	£823.40	£21.70	143	216
Audley End	£1,275.80	£34.00	664	86
Royston	£1,085.00	£32.00	341	178
Littleport			0	20
Downham Market	£799.00	£23.70	77	22
March	£440.00	£11.90	31	60

The figures in these tables are from www.nationalrail.co.uk in April 2015.

Commuting to Cambridge Maps

The following maps show graphically how people commute to Cambridge. The first map is for all modes of transport showing that the majority of people travel to Cambridge from an area with radius of approximately 20 miles.

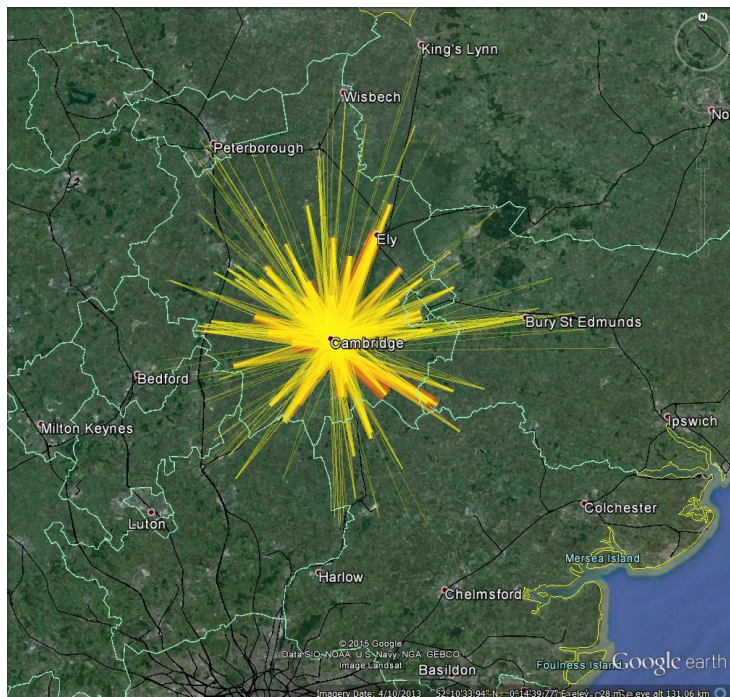


Figure 1: Commuting to Cambridge for all travel modes

For rail, commuting is dominated by Ely to Cambridge, followed by Littleport and Royston.

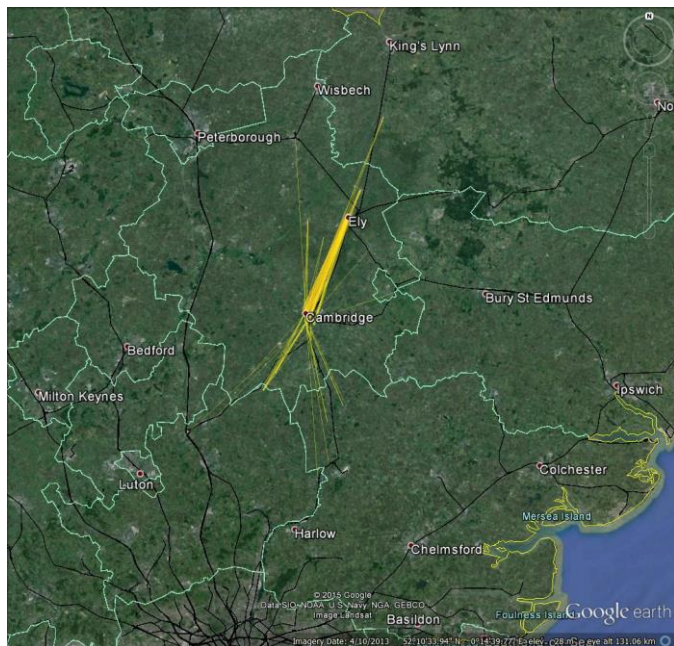


Figure 2: Commuting to Cambridge by rail

Buses are strong on the north west to south east axis, as this is not served by rail. Haverhill is particularly prominent, with Linton, Cambourne and St Ives also prominent.

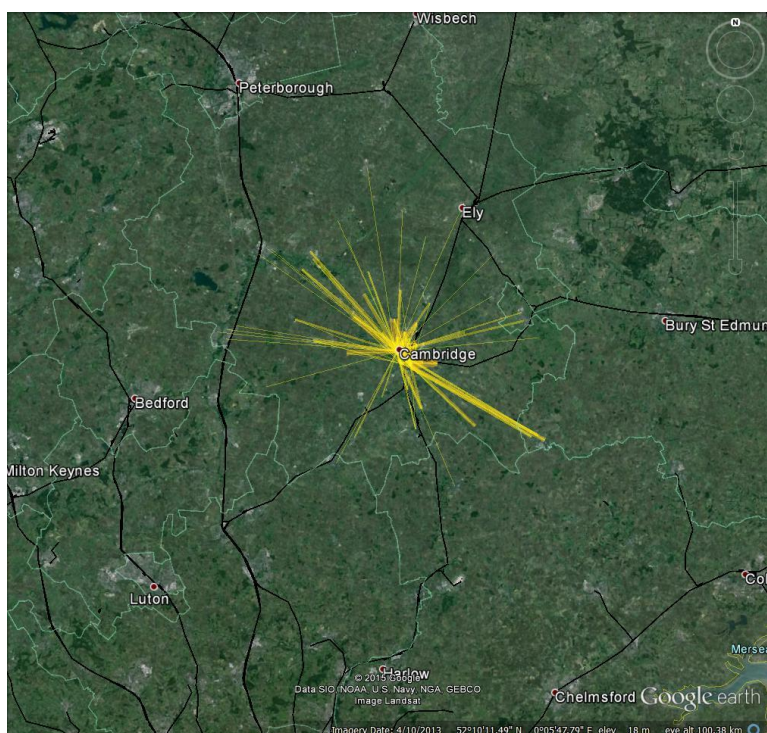


Figure 3: Commuting to Cambridge by bus

Cycling is very pronounced in the city, with journeys to outlying villages such as Cottenham and Waterbeach visible.

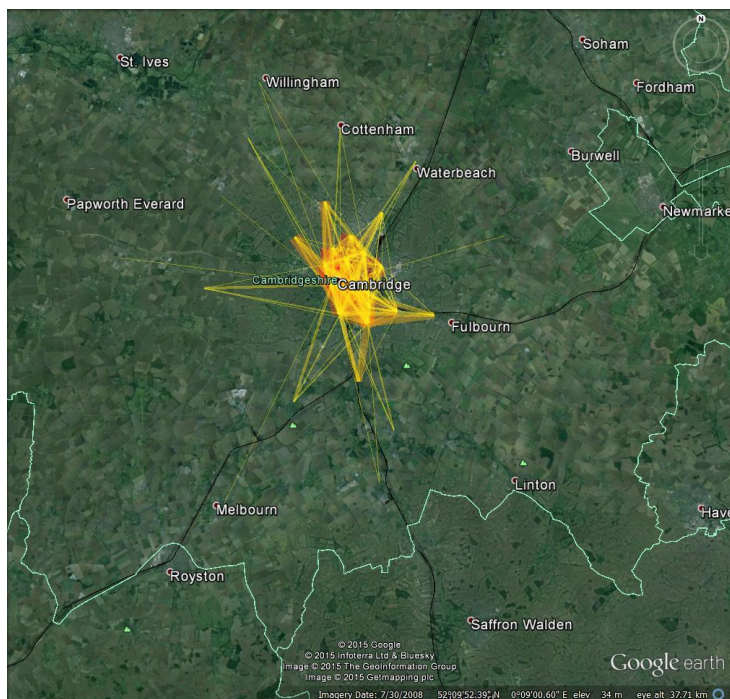


Figure 4: Commuting to Cambridge by cycle

Walking is, as expected, constrained to the city itself.

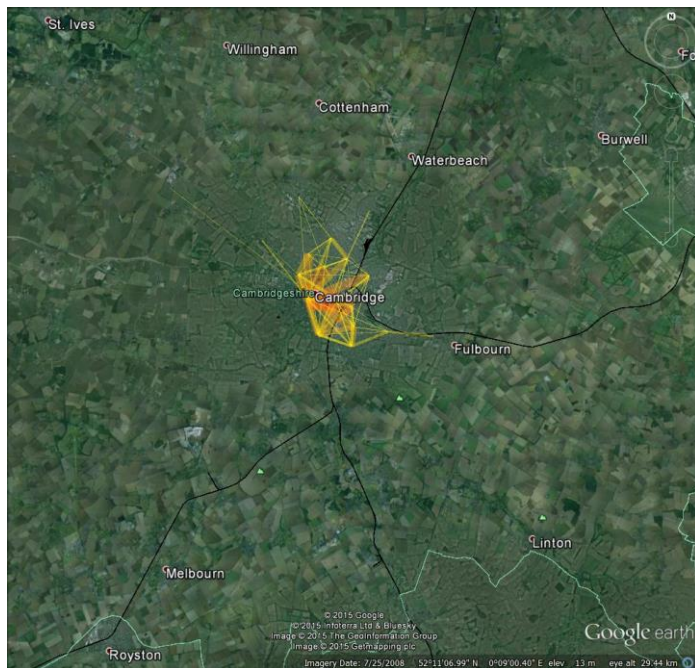


Figure 5: Commuting to Cambridge by walking

In the reverse direction for rail, London commuting dominates for people living in Cambridge.

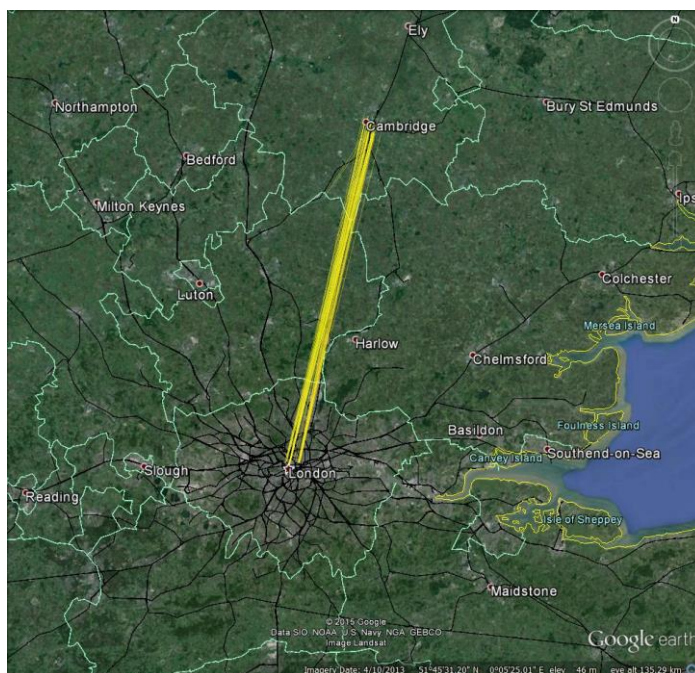


Figure 6: Commuting from Cambridge by Rail

The map below shows commuting patterns for people living in the Market Towns of Wisbech, March, Newmarket and Royston, showing that the Fenland towns of Wisbech and March mainly commute to other places in Huntingdonshire, Fenland and Norfolk, rather than Cambridge and South Cambridgeshire. Newmarket shows strong links to Cambridge and Bury St Edmunds, and Royston to Cambridge and London. The area around Duxford which includes the Wellcome Trust Genome Campus is also visible as a destination south of Cambridge.

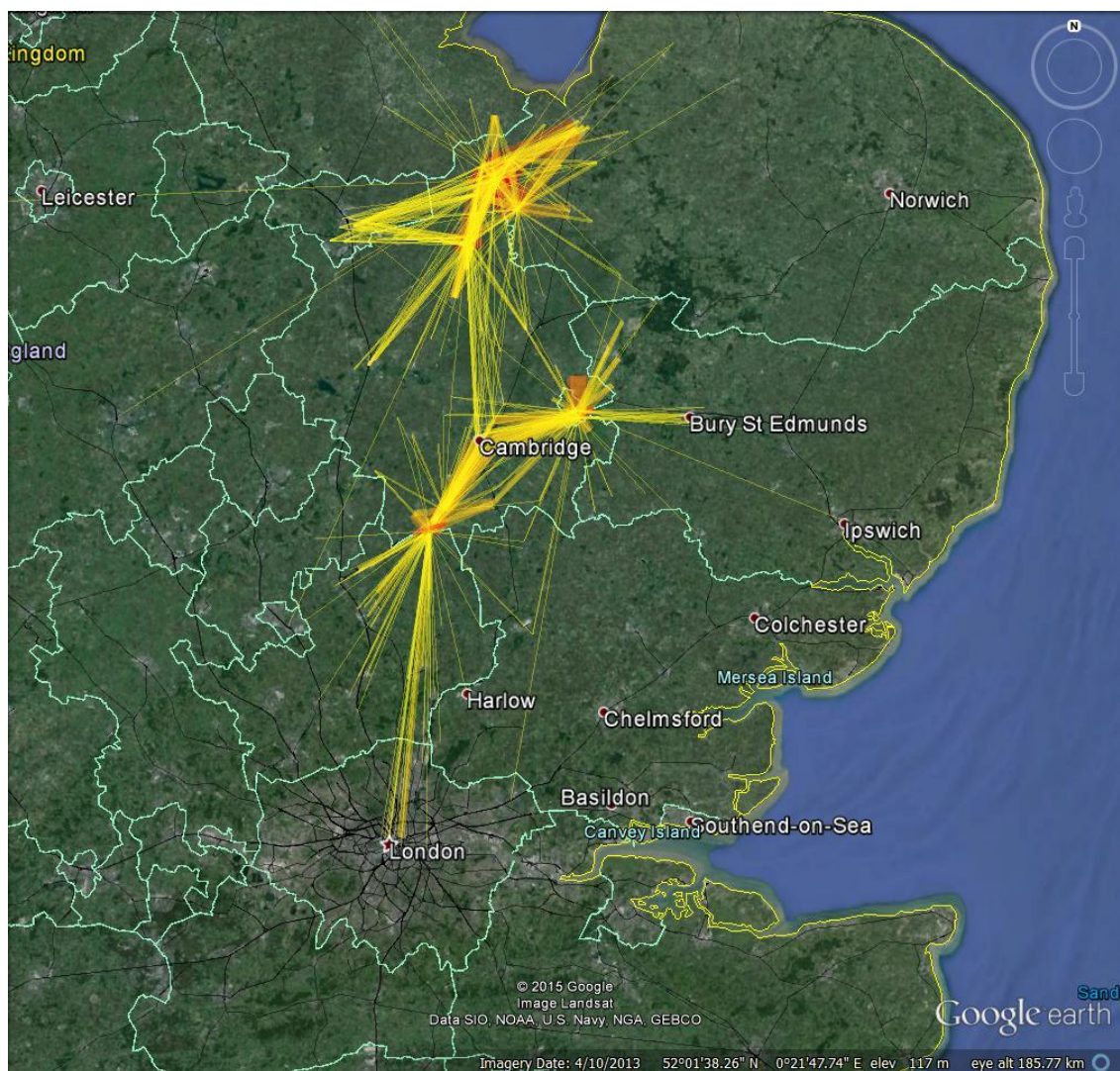


Figure 7: Commuting from market towns

Appendix - Extracting the Census Data

The 2011 Census gathered information about where people work and the travel mode for the longest part, by distance, of the journey to work.

www.ons.gov.uk/ons/guide-method/census/2011/the-2011-census/2011-census-questionnaire-content/2011-census-questionnaire-for-england.pdf

40 In your main job, what is the address of your workplace?

➤ If you work at or from home, on an offshore installation, or have no fixed workplace, tick one of the boxes below

➤ If you report to a depot, write in the depot address

Postcode

OR

☐ Mainly work at or from home

☐ Offshore installation

☐ No fixed place

41 How do you usually travel to work?

➤ Tick one box only

➤ Tick the box for the longest part, by distance, of your usual journey to work

☐ Work mainly at or from home

☐ Underground, metro, light rail, tram

☐ Train

☐ Bus, minibus or coach

☐ Taxi

☐ Motorcycle, scooter or moped

☐ Driving a car or van

☐ Passenger in a car or van

☐ Bicycle

☐ On foot

☐ Other

To preserve anonymity, the data is only available for groups of several thousand people. In the case of travel to work data, the highest resolution are the “Middle layer super output areas”. Cambridge is covered by 13 such areas, Cambridge 001 to Cambridge 013.



For reference, the map files containing showing these regions can be downloaded here: census.edina.ac.uk/easy_download_data.html?data=England_msoa_2011 (goo.gl/2v0pWN)

The data itself is published by the Office for National Statistics in Table WU03EW which can be accessed via this portal:

www.nomisweb.co.uk/census/2011/wu03ew

To download the data used in this study click ‘Query Data’ in the left hand column.

Then on the next page use ‘Make Selections’ to select the required data.

Method of Travel to Work allows you to select which modes of transport you are interested in.

Place of work and usual residence allow regions of interest to be defined in a number of different ways:

- 2011 census merged local authority districts (e.g. Cambridge, South Cambridgeshire etc)
- 2011 Super Output Areas - Mid Layer (e.g. 13 area for Cambridge)
- Countries (e.g. England, England and Wales etc)
- Regions (e.g. South East)

Multiple places can be selected, or 'All' for a particular category.

The number of spreadsheet cells which can be generated is limited, so, for example, if 2011 Super Output Areas - Mid Layer are used, and 'all' is selected for 'place of work' then only around 8 areas can be selected for 'usual residence' assuming all transport modes are being requested.

In 'Format/Layout', Comma separated values (.csv) was selected as the file format, and "Include area codes" was ticked before the spreadsheet was generated by clicking on 'Download Data'.

Note that from the initial page <http://www.nomisweb.co.uk/census/2011/wu03ew> it is also possible to see a high level summary of journey flows by using the "Interactive Visualisation" control in the left hand column; just select the area and click on 'View'.

File Processing

The CSV spreadsheets containing "2011 Super Output Areas - Mid Layer" data were initially processed to extract home, workplace pairs and for each pair the number of journeys for each main transport mode.

These were then further processed to extract data in the form of queries such as 'Living in Any', working in 'Cambridge' giving the number of people using each transport mode, and also generating a 'Google Earth kml' file to plot the results on Google Earth using lines proportional in width to the number of people travelling.

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