Journey to work data in the UK – what data are available?

Dr Oliver Duke-Williams, UCL (CeLSIUS, UK Data Service) Vassilis Routsis, UCL (UK Data Service)

12th March 2019







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Centre for Longitudinal Studies

www.cls.ucl.ac.uk



Consumer Data Research Centre

www.cdrc.ac.uk



CLOSER www.closer.ac.uk



ESRC Business and Local Government Data Research Centre

www.blgdataresearch.

NCRM

National Centre of Research Methods www.ncrm.ac.uk





UK Data Service www.ukdataservice.



Understanding Society www.understandings



Urban Big Data Centre www.ubdc.ac.uk

Society Counderstandings WWW.u
ociety.ac.uk

org

Forthcoming Events

- You may also be interested in future webinars in this series
 - Journey to work (March 12)
 - Ethnicity and migration (March 19)
 - Obesity (March 27)
 - Education (April 2)
- See: https://www.ukdataservice.ac.uk/news-and-events/events for details

The webinar today

Oliver

- Census microdata and longitudinal data
- Other sources

Vassilis

Census origin-destination data

- Questions
 - Type your questions into the questions box we will answer them at the end





Journeys to work in the UK – what data are available?

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Webinar: March 12th 2019



How do people travel to work?

 Poll: how do you usually travel to work / place of study?

- This question is not necessarily simple
 - Do you use more than one form of transport?
 - Do you combine journey to work with other activities?
 - Do you have different places of work?
 - Do you leave for work from different addresses on different days?

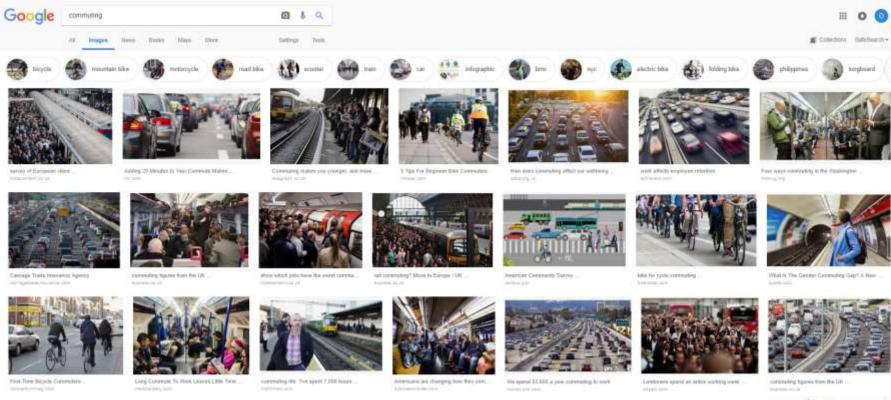








How do people travel to work?











Journey to work in longitudinal and census microdata

- What are the census longitudinal studies?
- What are the census microdata?

- Types of question in census data
 - Location and characteristics of the workplace
 - Relationship between workplace and residence
 - Distance between workplace and usual residence
 - Method of transport









Census microdata

- Often referred to as 'individual data'
- Two types
 - Cross-sectional microdata
 - Longitudinal microdata
- Contain all original responses (sometimes rounded etc)









Census microdata

- Variations over time in sample size and access arrangements
- Details available from
 - https://census.ukdataservice.ac.uk/get-data/microdata.aspx









'Samples of Anonymised Records'

		Open	Safeguarded	Secure
1991	Individuals		2% (GB,NI)	
	Households		1% (GB,NI)	
2001	Individuals		3% (UK)	
	Households			1% (EW)
	'Small Area Microdata'		5% (UK)	









'Census Microdata'

		Open	Safeguarded	Secure
1961	Individuals	1% (GB)	5% (GB)	9% (GB)
	Households		0.95% (GB)	
1971	Individuals	1% (GB)	5% (GB)	9% (GB)
	Households		0.95% (GB)	
1981	Individuals	1% (GB)	5% (GB)	9% (GB)
	Households		0.95% (GB)	
2011	Individual		5% (EW,S,NI)	10% (EW,S,NI)
	Households			10% (EW,S,NI)
	Individual ('Teaching')	1% (EW,S,NI)		









Longitudinal census data

- The ONS Longitudinal Study
 - A 1.1% sample of individuals in England and Wales (plus coresidents)
 - Census data from 1971 to 2011
 - Some admin data, especially mortality
- Sister studies
 - Scottish LS (5% sample, 1991 onwards)
 - Northern Ireland LS (28% sample, 1981 onwards)
 - Both have more admin data than the ONS LS does
- Information about all three studies: <u>calls.ac.uk</u>









Using the longitudinal studies

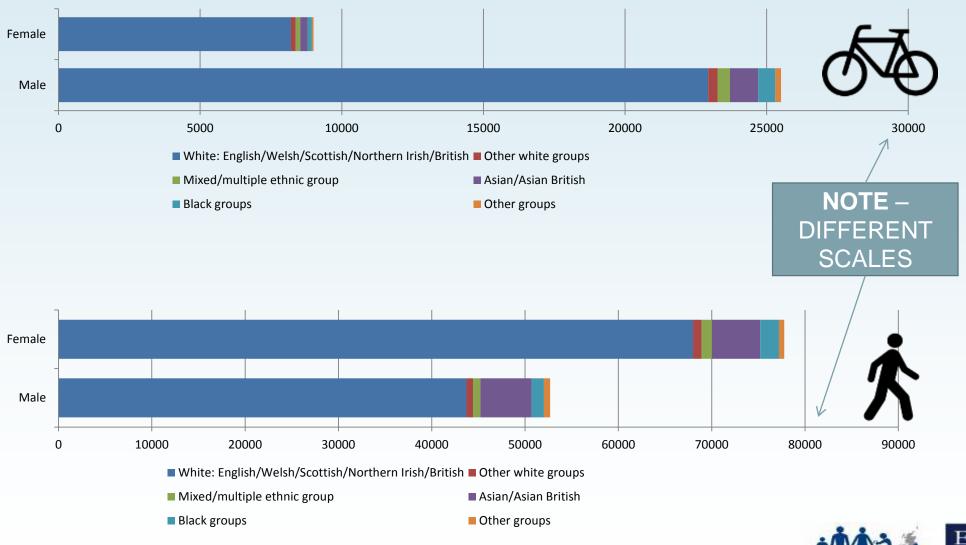
- Two access routes
 - In person at a secure setting
 - Submission of Stata etc scripts to be run remotely
- No data will be transferred out of the secure setting until it has had disclosure clearance











Source: 2011 Census microdata



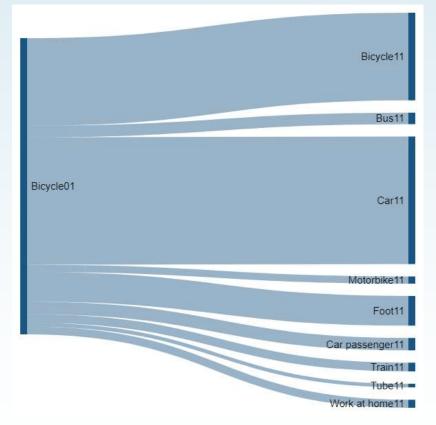






Example: do people keep the same mode of transport for their journey to work?

 People who used a bicycle to travel to work in 2001, by mode of travel to work in 2011



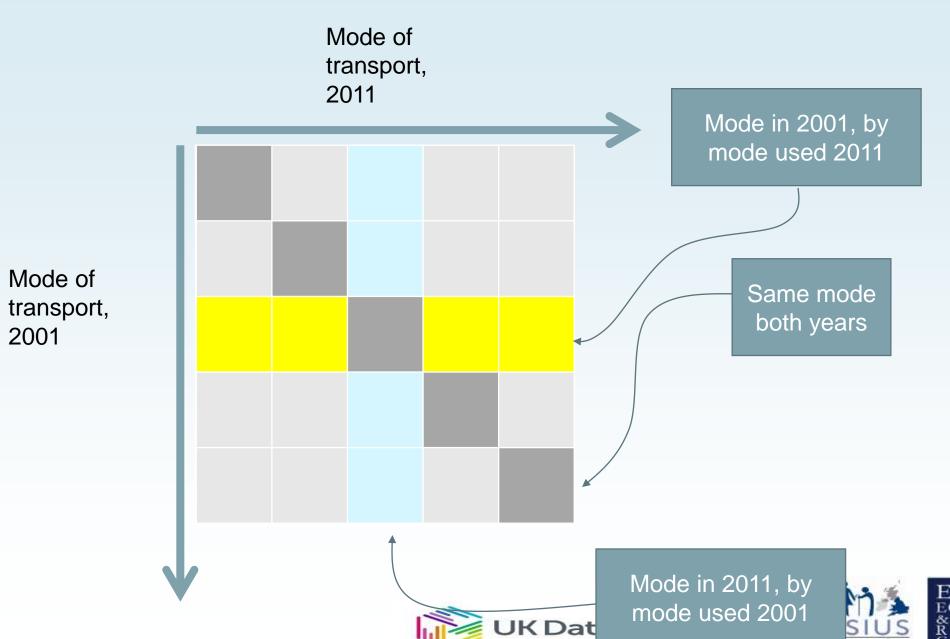






Source: ONS Longitudinal Study





Stability 2001 to 2011



For each 2001 mode

most common 2011 outcome

second most common 2011 outcome

					M	<u>ode in 20</u>	11				
		Train	Tube	Bus	Driving a car or van	Passenger in a car or van	Motorcycle	Bicycle	On foot	Work mainly at or from home	Total
	Train	41%	6%	4%	32%	2%	1%	2%	5%	7%	6324
	Tube/Metro/Light rail/tram (E&W)	17%	33%	8%	24%	2%	1%	3%	5%	7%	3849
_	Bus/Minibus/Coach	5%	3%	27%	39%	8%	0%	2%	12%	3%	10638
200	Drive car/van	2%	1%	2%	82%	2%	1%	1%	4%	5%	93087
.⊑	Passenger car/van	3%	1%	8%	53%	20%	1%	2%	10%	3%	10522
Mode	Motor cycle/Scooter/Moped	4%	2%	3%	56%	4%	19%	6%	4%	3%	1840
≥	Bicycle	3%	1%	4%	43%	4%	2%	30%	10%	3%	4415
	On foot	3%	2%	7%	40%	6%	1%	3%	34%	4%	14621
	Works at/from home	3%	1%	2%	54%	3%	0%	1%	7%	28%	14035
Total		7381	3428	7323	105507	6879	1248	4053	13075	10437	159331

- 30% retention rate for cyclists
- 34% retention rate for walkers







Source: ONS Longitudinal Study



Workplace location

- Workplace location is available to a detailed level in restricted access data
- User-level detail has varied from census to census
 - 1971: local authority
 - 1991: location indicator
 - 2001: location indicator
 - 2011: local authority









Distance to work

- Reported data has also varied between censuses
 - 1971: not included (ward-to-ward in restricted data)
 - 1991: banded distances
 - 2001: detailed distance
 - 2011: detailed distance
- Restricted data can be used to derive distances
- Distances can only be used in output when they are not disclosive









Mode of transport to work

 The question has similar but not identical response categories between countries and between years







ONS LS: Response categories



1971	1981	1991	2001	2011
		Mainly at home	Work mainly at or from home	Work mainly at or from home
		Underground, Tube, Metro	Underground, metro, light rail, tram (England and Wales only),	Underground, metro, light rail, tram
Train		BR train	Train	Train
Bus		Bus, Mini-bus, Coach (public or private)	Bus, minibus or coach	Bus, minibus or coach
Motor cycle		Motor Cycle, Scooter, Moped	Motor cycle, scooter or moped	Motorcycle, scooter or moped
Car		Driving Car/Van	Driving a car or van	Driving a car or van
		Passenger in Car/Van	Passenger in a car or van	Passenger in a car or van
			Taxi or minicab	Taxi
Pedal cycle		Pedal Cycle	Bicycle	Bicycle
On foot		On foot	On foot	On foot
Other		Other	Other	Other method of travel to work







NILS: Response categories



1981	1991	2001	2011
Train	Train	Train	Train
			Underground, metro, light rail, tram
Public Service Bus	Public service bus	Bus, minibus or coach	Bus, minibus or coach
Employer's Bus	Employees bus		
Motorcycle, moped, scooter	Motor- cycle,moped,scooter	Motorcycle, scooter or moped	Motorcycle, scooter or moped
		Taxi	Taxi
Car or van - Pool, sharing driving	Car or van pool, sharing driving	Car or van pool	Car or van pool, sharing driving
Car or van - Driver	Driving a car or van	Driving a car or van	Driving a car or van
Car or van - Passenger	Passenger in a car or van	Passenger in a car or van	Passenger in a car or van
Pedal cycle	Pedal cycle	Bicycle	Bicycle
On foot	On foot	On foot	On foot
Other	Other	Other method	Other method of travel to work
Works mainly at home	Works mainly at home	eWorks mainly at or from home	Work mainly at or from home
		Lui Ziel Lik Luata Serv	VICE LELVILLY



SLS: Response categories



1991	2001	2011
BR train	Train	Train
Underground; Tube; Metro	Underground	Underground subway metro light rail or tram
Bus; Mini-bus; Coach (public or private)	Bus	Bus minibus or coach
Motor Cycle; Scooter; Moped	Motor Cycle	Motorcycle scooter or moped
Driving Car / Van	Driving a car or van	Driving a car or van
Passenger in Car / Van	Passenger in a car or van	Passenger in a car or van
	Taxi	Taxi
Pedal Cycle	Bicycle	Bicycle
On foot	On foot	On foot
Other	Other	Other
Mainly at home	('no code required')	Work or study mainly at or from home









Other datasets

- National Travel Survey
- Understanding Society









National Travel Survey

- Based on detailed travel diaries
 - First survey in 1965, available for various periods
 - "primarily designed to measure long-term trends in travel and is not suitable for monitoring short-term trends or year-on-year changes"









National Travel Survey

- Microdata allows exploration of trends by
 - Households
 - Vehicles
 - Individuals
 - Trips
 - Stages
- Data can be aggregated across these categories
- Data are typically for a multi-year period









Stage number within a given trip	_ 1	2	3	4	5	6-9	Total
Stage mode of travel						_	
Walk	12	17	38.3	43.1	44.5		12.4
Bicycle	1.8	0.6	2.3	0.9	0.4		1.8
Car/van driver	48	8.7	8.4	8	7.6		46.3
Car/van passenger	26.5	7.9	8.5	8.8	14.4		25.7
Motorcycle	0.4	0	0.1	0	0		0.3
Other private transport	0.9	2	0.7	0.8	0.4		0.9
Bus in London	2	7.8	8.4	9.2	4.9		2.2
Other local bus	5.1	12.4	5.2	3.9	6		5.4
Non-local bus	0.1	0.8	0.4	0.5	0.2		0.1
London Underground	0.8	10.2	13.1	5.1	3		1.2
Surface Rail	1	27.2	7.9	12.5	5.9		2
Taxi/minicab	1.3	1.3	4.6	5.2	11.3		1.3
Other public transport	0.2	4	2.2	1.9	1.2		0.4
Total	100	100	100	100	100		100
N=	4238446	146051	41352	5218	896		4432170









Questions on Transport and Commuting

Methods to search for variables representing questions on transport and commuting

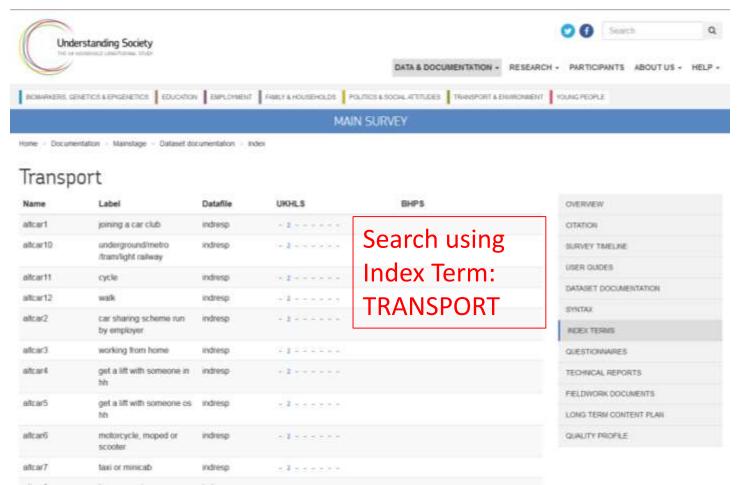
An initiative by the Economic and Social Research Council, with scientific leadership by the Institute for Social and Economic Research, University of Essex, and survey delivery by the National Centre for Social Research.

Understanding Society: Overview

Questionnaire Grid

Understanding Society has many modules that relate to transport and environment research areas. The following grid highlights which modules we ask, what types of information is included, and how often the modules are included. Some modules are answered by adults (aged 16 and over), whilst others are asked to the youth panel (aged 10-15).

Module	How often asked?	Broad content				
Data on adults						
Environmental behaviour	Waves 1, 4 and 10	Environmental habits (including recycling, public transport use), miles driven per year, internet use				
Environmental attitudes (self-completion)	Waves 1, 4 and 10	Self-perceived environmental friendliness, energy use, beliefs related to climate change, willingness to change lifestyle, speed of climate change effects				
Commuting behaviour	Two yearly	Distance, difficulties of commute if travelling by car or van				
Employees	Annual	Includes questions on commuting				
Self-employment	Annual	Includes questions on commuting				
Transport behaviour	Two yearly (from Wave 4)	Frequency of travel by private and public transport, frequency of cycling, reasons for not cycling, car-sharing, number of cars in household, car purchase decisions				
Data on children						
Environmental behaviour/attitudes	Two yearly (from Wave 4)	Mode of travel to school, energy use, beliefs related to climate change				
Data on households						
Environmental behaviour	Waves 1 and 4	Household recycling behaviour, use (or consideration of) renewable energy				
Structural characteristics	Annual	Includes questions on number of cars or vans in household, whether car/van bought new or second-hand				



https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/index/transport

in the same	Main means of travel to	indones		
pthwn	work	indresp		H1 H2 H3 B4 B5 H6 H7 HH
				00 010 011 012 013 014
				H15 816 H17 H18
jbthvt	Minutes spent travelling	indresp	1 2 3 4 5 6 7 8	RS 82 RS 84 BS 86 R7 BR
	to work			89 810 811 812 813 814
				H15 816 H17 H1H
sttwm	S/emp: Main means of	indresp		81 82 83 84 85 86 87 88
	travel to work			89 810 811 812 813 814
				815 B16 B17 B18
jsttwt	S/emp: commuting time	indresp	1 2 1 4 5 6 7 8	81 82 83 84 85 86 87 88
	provided			N9 010 012 012 013 014
				H15 H16 H17 H18
stiwth	S/emp: commuting time	indresp	12345678	81 02 81 84 85 86 87 88
				89 H10 811 B52 H13 H14
				R15 016 R17 R18
jstlwlb_cawi	Time taken to get to work (CAWI)	indresp	7 8	Look further down the
iffthh	willingness to rideshare with hh member	indresp		list for questions on
liftxhh	willingness to rideshare with non-hh member	indresp		commuting
mgxty3	Car purchase	hhresp	+ 2 3 4 5 6 7 8	81 82 83 84 85 86 87 88
				89 810 811 812 813 814
				815 810 817 818
mgxty3_bh	Extra loan for car	hhresp		H1 H2 H3 B4 B5 B6 H7 BH

https://www.understandingsociety.ac.uk/documentation/mainstage/dataset-documentation/index/transport

Frequency of using bicycle

Freq	uen	cies
гтец	uen	cies

Value label	Value	Absolute frequency	Relative frequency
missing	-9	2	0.01%
proxy	-7	1683	4.28%
refusal	-2	40	0.1%
don't know	-1	43	0.11%
At least once a day	1	784	2.0%
Less than once a day but at least 3 times a week	2	846	2.15%
Once or twice a week	3	1199	3.05%
Less than that but more than twice a month	4	843	2.15%
Once or twice a month	5	1446	3.68%
Less than that but more than twice a year	6	1975	5.03%
Once or twice a year	7	2500	6.36%
Less than that or never	8	27928	71.08%
	Total	39289	100.0%

Index Term

Transport

Wave Occurrences

4, 6, 8

Source: Understanding Society (wave 8)



Access to data

Census longitudinal	Available via support units, see https://calls.ac.uk/ Secure access: accredited researchers & approved projects
Census microdata	Available via UK Data Service Open, registered and secure variants
Understanding Society	Available via UK Data Service for registered users https://www.understandingsociety.ac.uk/
National Travel Survey	Available via UK Data Service Registered, Special License and Secure variants







UK Census Journey to work data





UK Census Journey to work data

What are flow data?

- Flow data are also known as 'interaction data' or 'origin-destination data'
- The data consist of counts of flows between two locations
- Data are produced at different spatial scales
- In the case of census flow data, we can also identify moves within an area
 - These flows are not always captured by other data
- As well as 'normal' areas, flows may be associated with various aggregate and pseudo-spatial areas
 - 'Overseas', 'Works at home', 'Works off-shore' etc.
- There has been different handling of cases such as these over time
- Data sets are available for 1981, 1991, 2001, and 2011 Census





Census questions

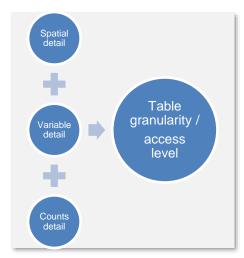
The various data sets all stem from questions on the Census form:

- Migration tables
 - Flows between an origin and a destination
 - based to question 21: What was your usual address one year ago?
- Student tables
 - A subset of migration data
 - a subset of migration tables for people who indicated that their address one year ago was a student / school address
- Workplace tables
 - Journey to work. Flows between a residence and a workplace
 - based on question 40: In your main job, what is the address of your workplace?
- Second residence tables
 - Several different sets of flows, e.g. second residence to work, first residence to second residence etc.
 - based on questions 5 and 6 for England and Wales only: Do you stay at another address for more than 30 days a year? What is that address?

 UK Data Service
 Census Support

Access to data

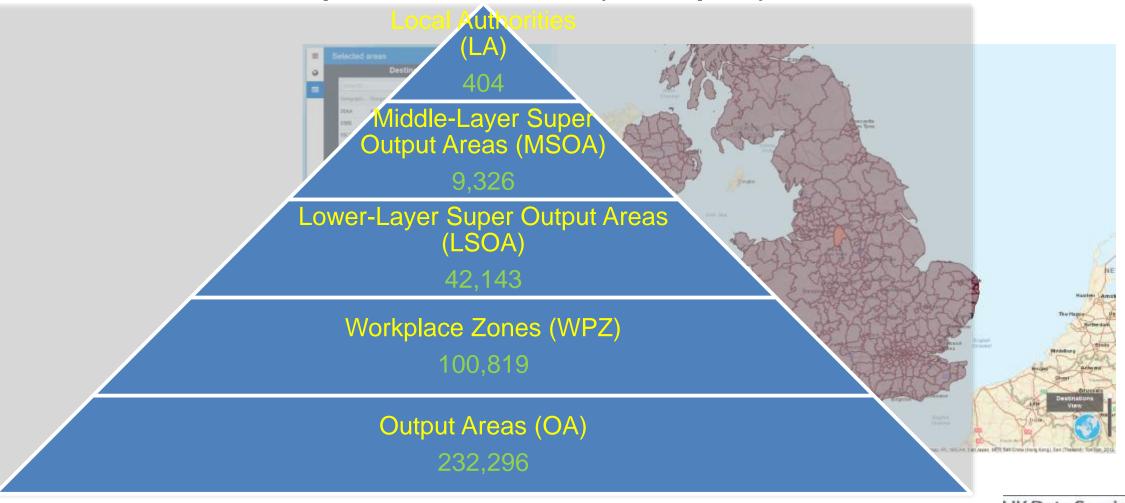
- Data from 1981, 1991, 2001 are now considered to be publically available
- Data from 2011 is much more confusing
 - Multiple levels of access
 - Trade off between spatial detail and attribute detail
 - Different routes to using the data
 - Different tables available at one of three levels:
 - Public: available via ONS, Nomisweb and UK Data Service-CS to any users via Open Government Licence (OGL) without the need to register or login to any system
 - Safeguarded: available via UKDS to members of academia, local and central government, NHS, and UK parliaments and assemblies via End User Licence (EUL) so need to register and login
 - Secure: available to approved researchers through the Approved Researcher Scheme via the ONS Secure Research Service (SRS) – formerly known as Virtual Microdata Laboratory







2011 Census Spatial scales (sample)





2011 Census workplace variables (sample)

age sex approximated social grade car or van availability in the household country of birth economic activity ethinic group family status hours worked industry method of travel to work NS-SeC occupation





Types of table counts

Flow (headcount)

Table WF01BUK: Location of usual residence and place of work:

Persons 1

WF01BUK

W - workplace

F - flow (head count)

B – table number subset (optional) – excluding quasi workplaces

01 – table number 1

UK – for United Kingdom

Univariate: tables relate to one variable

Table WU02UK: Location of usual residence and place of work by age:

	Persons
All categories: Age 16 and over	1
16-24	2
25-34	3
35-49	4
50-64	5
65-74	6
75+	7

WU02UK

W – workplace

U – univariate

02 – table number 2

UK – for United Kingdom

Multivariate: tables where one variable is cross-classified by at least one other variable

	/M12EW. Location of usual residence and place of work by method of travel to work by sex by age (with 'outside All categories: Sex						Male							Female							
	All categories Age 16 and over	16-24	25-34	35-49	50-64	65-74	75+	All categories Age 16 and over	16-24	25-34	35-4	950-6	465-74	75+	All	16-24	25-34	35-4	50-6	4 65-7	4754
All categories: Method of travel to work	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Work mainly at or from home	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Underground, metro, light rail, tram	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
	64	65	66	67	68	69	70	71	72	73	74	75	76	72	78	79	80	61	82	83	84
Bus, minibus or coach	100	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Taxo	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126
Matarcycle, scooter or moped	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147
Driving a car or van	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168
Passenger in a car or van	169	170	171	172	173	174	175	176	177	178	179	180	161	182	183	184	185	186	187	188	189
Bicycle	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210
On foot	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231
Other method of transport to work	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252

WM12EW

W – workplace

M – multivariate

12 – table number 12

EW – for England and Wales



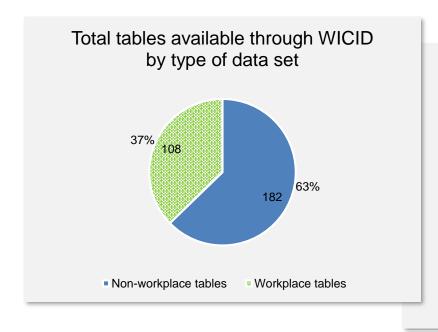
Security classification for workplace tables

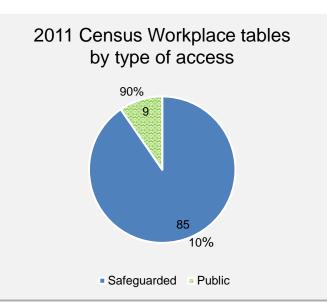
Geography	Flow (headcount) SWS	Univariate SWS	Multivariate SWS
LA to LA	Public	Sex, Age, Method of travel: Public	Some vars: Safeguarded
		Others: Safeguarded	Other vars: Secure
MSOA to MSOA	Safeguarded	Sex, Age, Method of travel: Public	Some vars: Safeguarded
LSOA to LSOA		Others: Safeguarded	Other vars: Secure
OA to OA	England & Wales: Public	All: Secure	All: Secure
OA to WPZ	UK: Safeguarded		

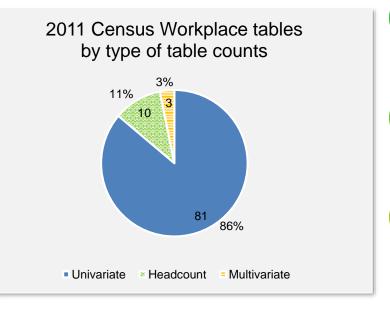


Some statistics

- WICID hosts 108 census workplace tables in total of which
 - 94 are part of the 2011 Census
 - with 85 of them being safeguarded and 9 public tables





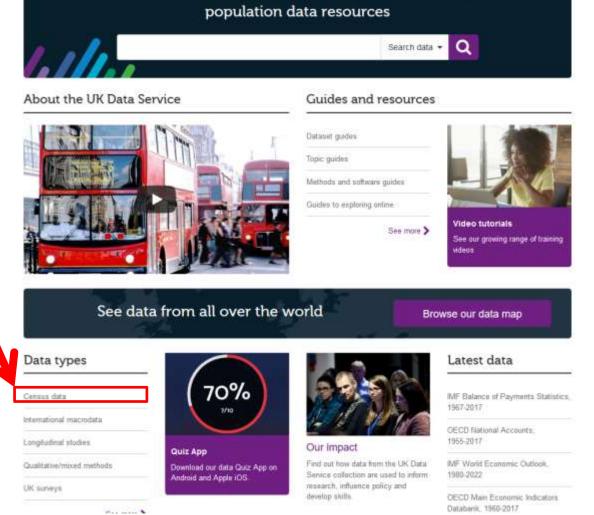






UK Data Service website

- Visit https://ukdataservice.ac.uk/
- Select 'Census data'



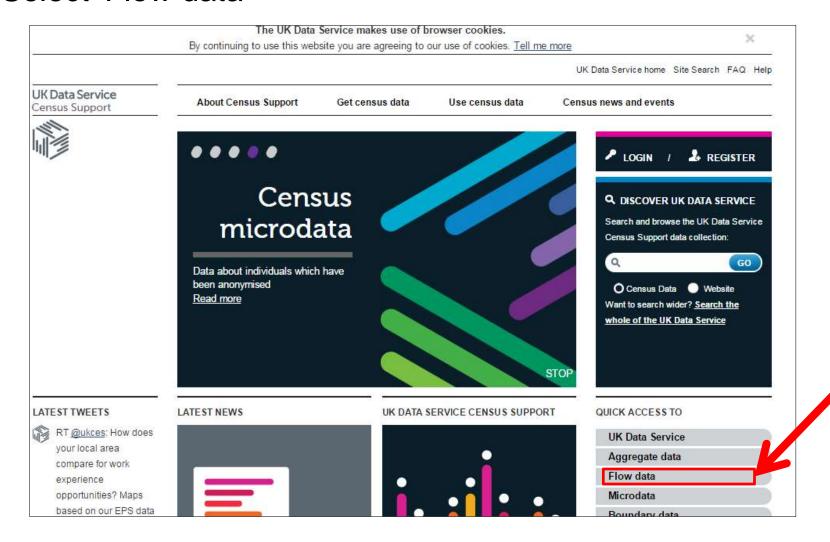
Explore the UK's largest collection of social, economic and





Census Service website

Select 'Flow data'



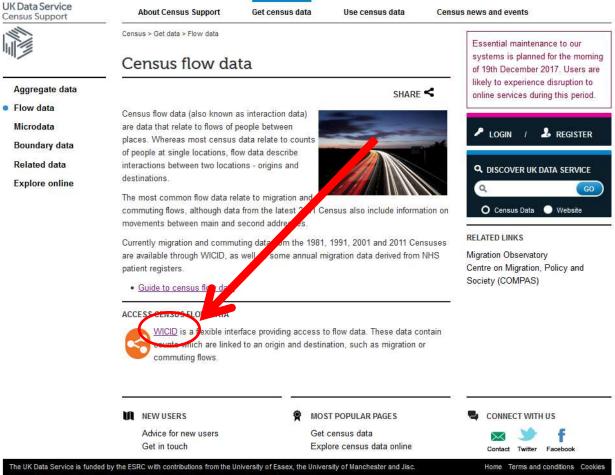




Flow data summary at Census Support

UK Data Service home Site Search FAQ Help

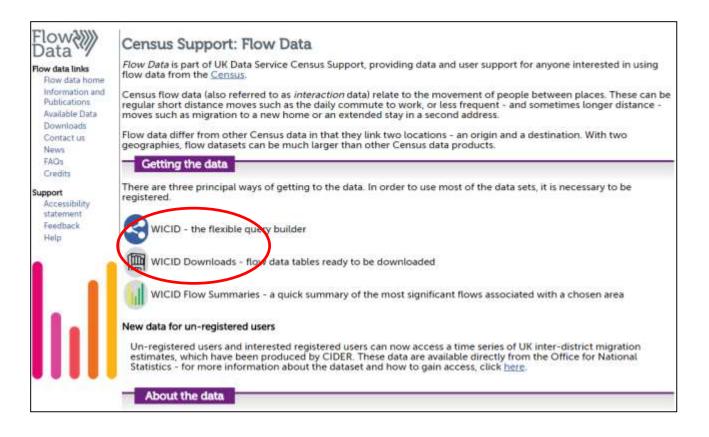
- 'Flow data' is the top level
 - 'WICID' is part of the Flow Data site





Flow data homepage (i)

- Two main routes to data
 - Downloads
 - Flexible queries

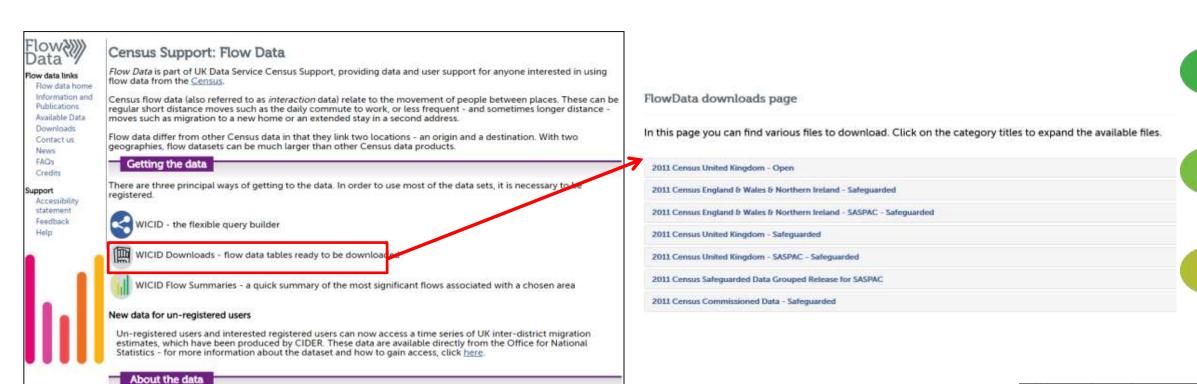


- The data are available in a variety of forms
 - Download of complete tables
 - Download for use with SASPAC software (Small Area Statistics PACkage)
 - Download of subsets -selected tables- via the Web Interface to Census Interaction Data (WICID)



Download of complete tables

For the download of bulk complete tables use the WICID Downloads icon.
 Data is only available for 2011 Census.

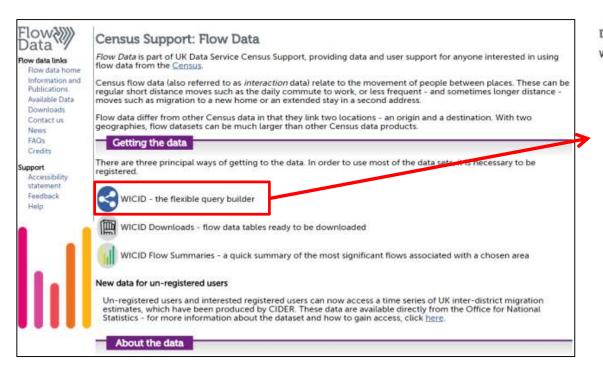






Download of subsets

• For the download of table subsets use the WICID Downloads icon. Data is available for 1981, 1991, 2001, and 2011 censuses.









Login screen

- For use with OGL/Public data, use 'Standard Login'
 - Registered access offers open data AND safeguarded data



Standard login (public access datasets)



Start a new session - no username or password required

Registered access for academic and most other users



Login using Shibboleth / UK Federated Access Management

Registered access requires users to register with UK Data Service and accept the UK Data Service's End User Licence



Useful links

- Flow data and WICID website:
 - https://wicid.ukdataservice.ac.uk/
- UK Data Service Flow Data Guide
 - https://census.ukdataservice.ac.uk/use-data/guides/flow-data.aspx
- UK Data Service Registration Page
 - https://ukdataservice.ac.uk/get-data/how-to-access/registration.aspx
- ONS 2011 Census Guide
 - https://www.ons.gov.uk/census/2011census/2011censusdata/originanddestinationdata
- ONS Secure Research Service
 - https://www.ons.gov.uk/aboutus/whatwedo/paidservices/virtualmicrodatalaboratoryvml





Questions

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