Using MOT Data to Investigate Patterns of Vehicle-use and Links with Air Quality

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Bristol

UWE BRISTOL University of the West of England

bettertogether

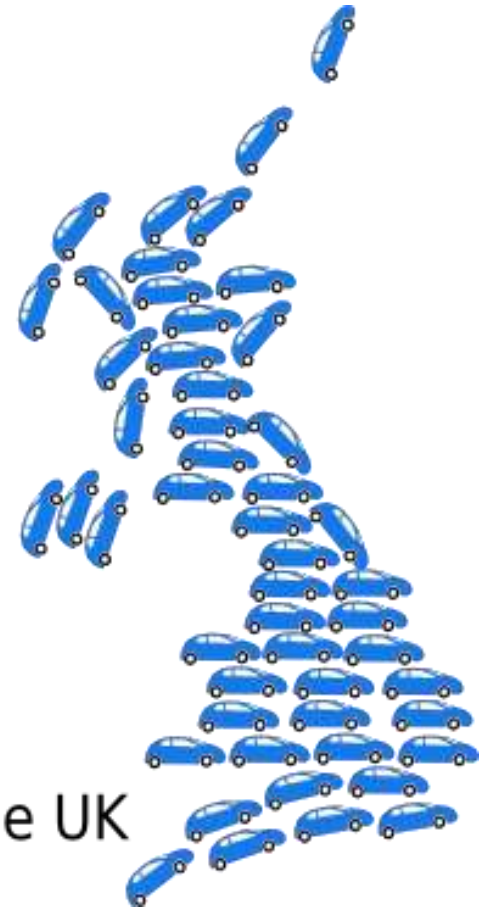
Department for Transport

DEPARTMENT OF ENERGY & CLIMATE CHANGE

EPSRC
Engineering and Physical Sciences Research Council

RESEARCH COUNCILS' energy PROGRAMME

MOT



Motoring and Vehicle **O**wnership **T**rends in the UK

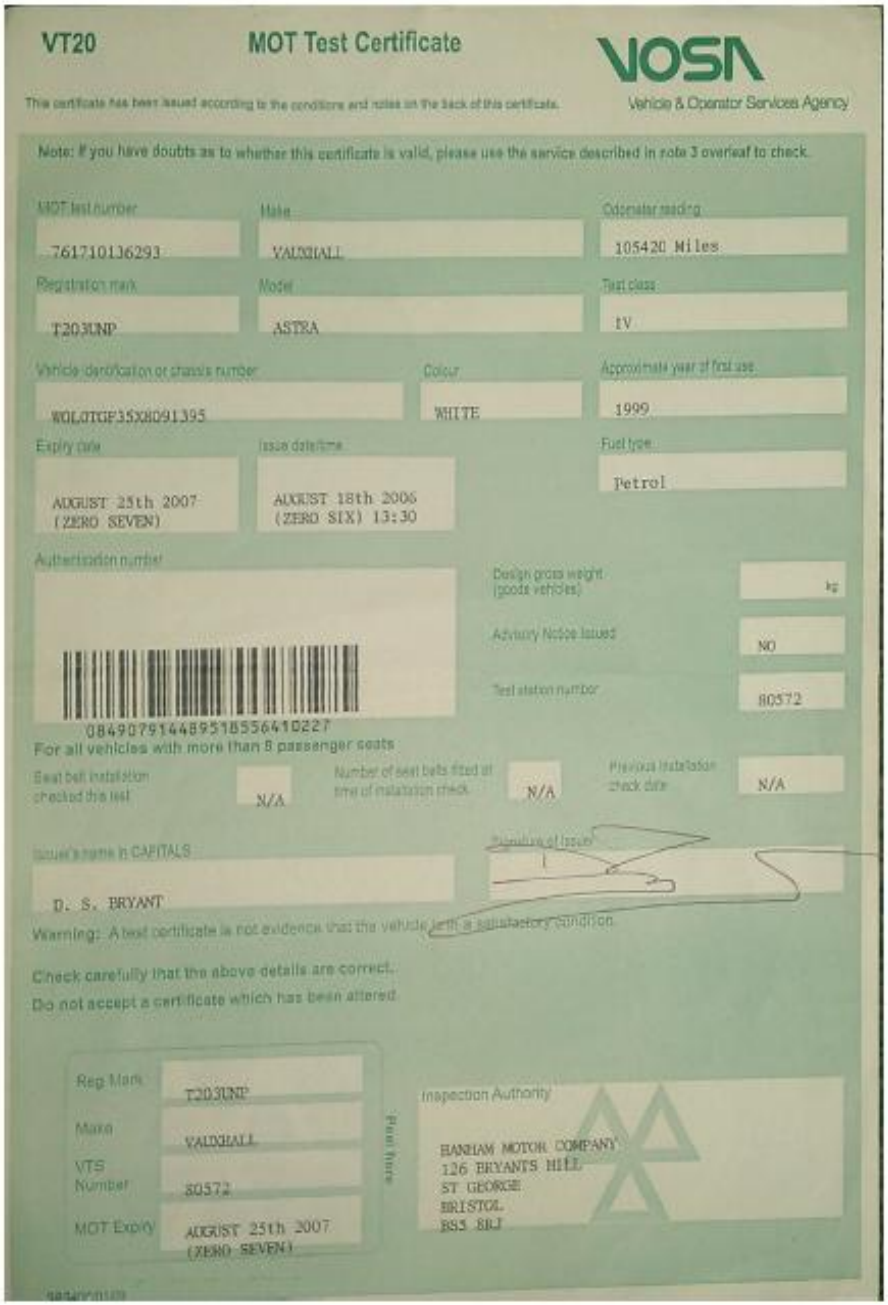
1 4 9 5 UNIVERSITY OF ABERDEEN

TRL

UWE BRISTOL
University of the West of England

University of BRISTOL

Why MOT?



VT20 MOT Test Certificate

VOSA Vehicle & Operator Services Agency

This certificate has been issued according to the conditions and notes on the back of this certificate.

Note: If you have doubts as to whether this certificate is valid, please use the service described in note 3 overleaf to check.

MOT test number: 761710136293	Make: VAUXHALL	Odometer reading: 105420 Miles
Registration mark: T203UNP	Model: ASTRA	Test class: IV
Vehicle identification or chassis number: WOL0TGF35X8091395	Colour: WHITE	Approximate year of first use: 1999
Expiry date: AUGUST 25th 2007 (ZERO SEVEN)	Issue date/time: AUGUST 18th 2006 (ZERO SIX) 13:30	Fuel type: Petrol
Authorisation number: 084907914489518556410227	Design gross weight (goods vehicles): kg	
	Advisory Notice issued: NO	
	Test station number: 80572	

For all vehicles with more than 8 passenger seats

Seat belt installation checked this test: N/A	Number of seat belts fitted at time of installation check: N/A	Previous installation check date: N/A

Issuer's name in CAPITALS: D. S. BRYANT

Signature of issuer:

Warning: A test certificate is not evidence that the vehicle is in a satisfactory condition.

Check carefully that the above details are correct.
Do not accept a certificate which has been altered.

Reg Mark: T203UNP	Inspection Authority: HANHAM MOTOR COMPANY, 126 BRYANTS HILL, ST GEORGE, BRISTOL, BS5 8RJ
Make: VAUXHALL	
VTS Number: 80572	
MOT Expiry: AUGUST 25th 2007 (ZERO SEVEN)	

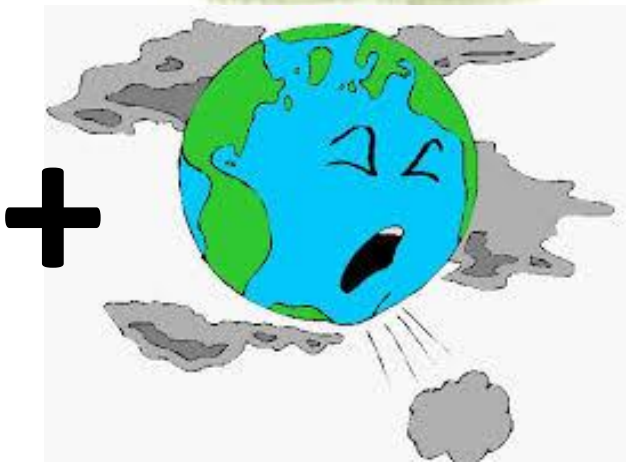
Print Here

- MOT: the UK's annual safety inspection for all road vehicles older than 3 years
- Since 2005: the results have been captured and stored digitially
- In November 2010 — the DfT published the first 5 years of this data online!!!

35 million vehicle tests each year

>160m datapoints


CO2



Transport and Domestic

CO_2 and Energy

22% of UK CO_2 emissions from transport

>42% of this is private cars

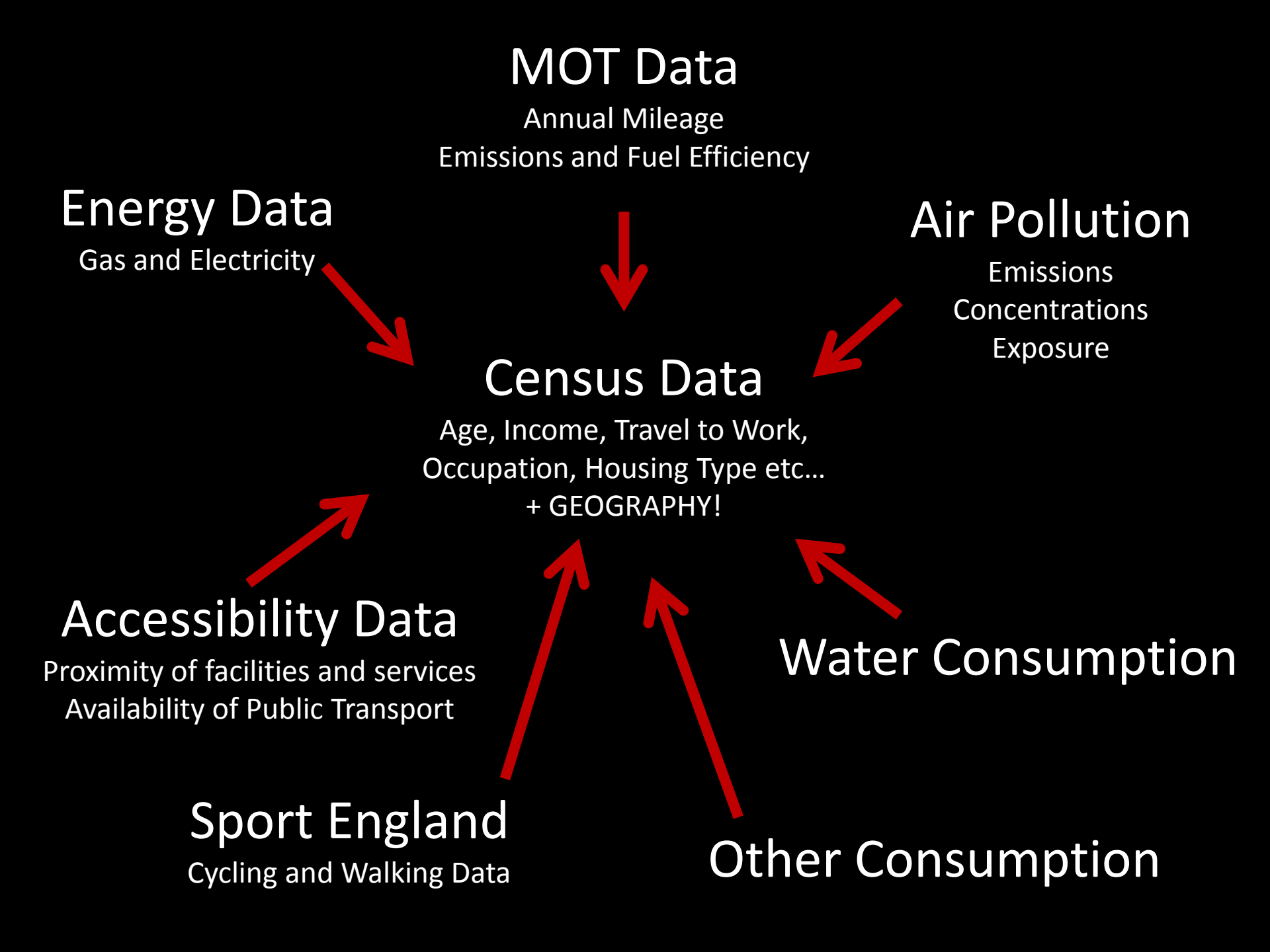
Road transport is 27% of UK energy consumption

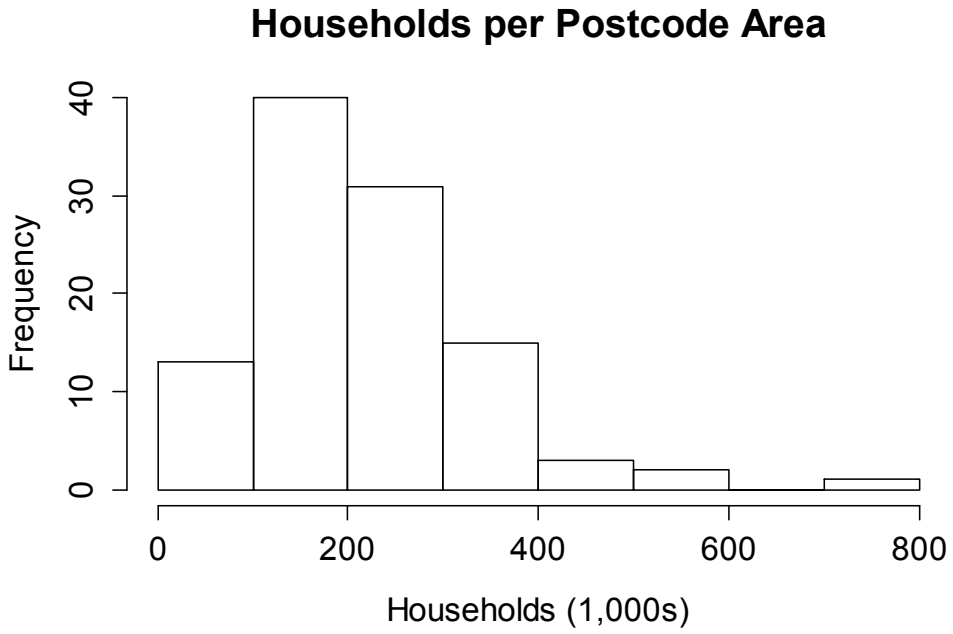
Move to electric vehicles and non-fossil fuels will put strain on other energy sectors (electricity grid and biofuels)

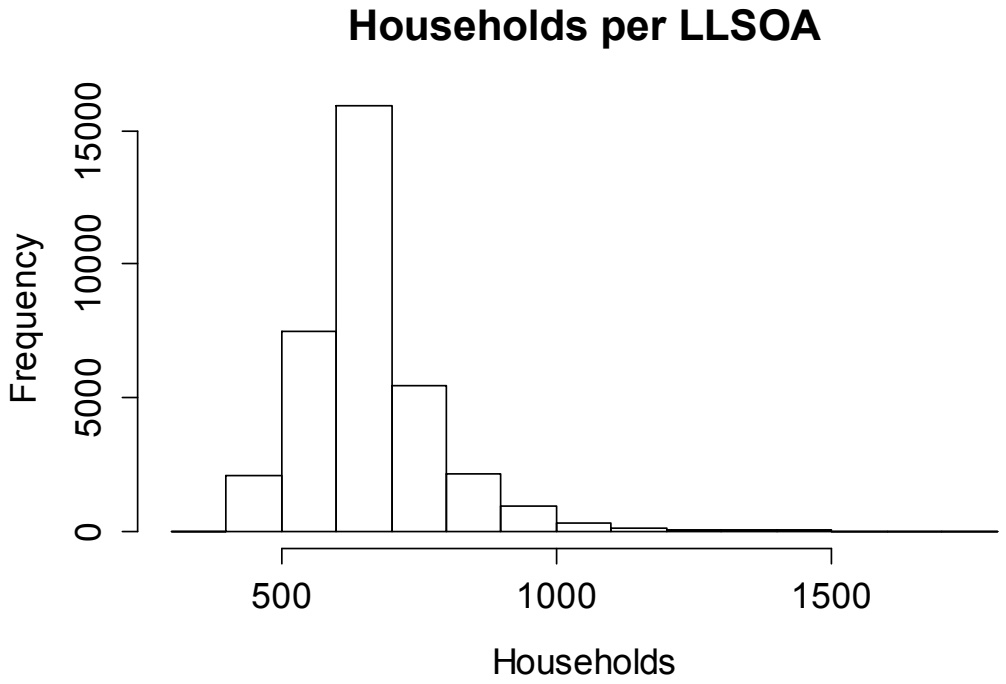
If we take a ‘lifestyle’ view then it is important to consider a holistic carbon footprint

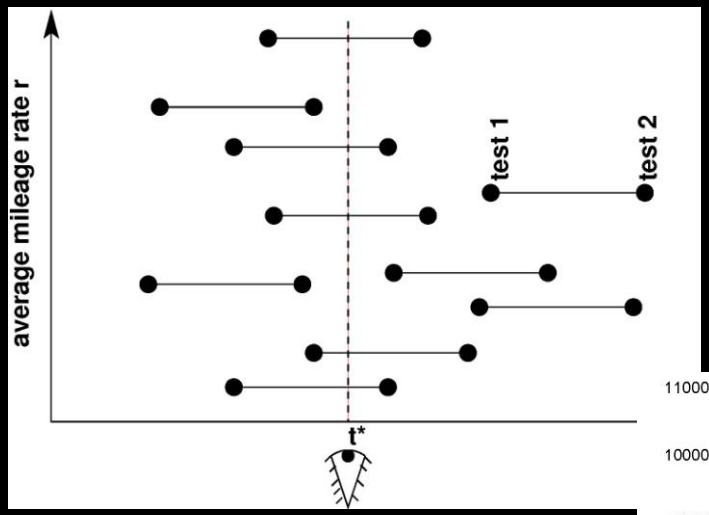
e.g. Does driving less increase domestic footprint?


Nothing to be afraid of
just jump right in


MOT Data
Annual Mileage
Emissions and Fuel Efficiency
Energy Data
Gas and Electricity
Air Pollution
Emissions
Concentrations
Exposure
Census Data
Age, Income, Travel to Work,
Occupation, Housing Type etc…
+ GEOGRAPHY!
Accessibility Data
Proximity of facilities and services
Availability of Public Transport
Water Consumption
Sport England
Cycling and Walking Data
Other Consumption


Households per Postcode Area
Frequency
0
10
20
30
40
0
200
400
600
800
Households (1,000s)


Households per LLSOA
Frequency
0
5000
10000
15000
500
1000
1500
Households



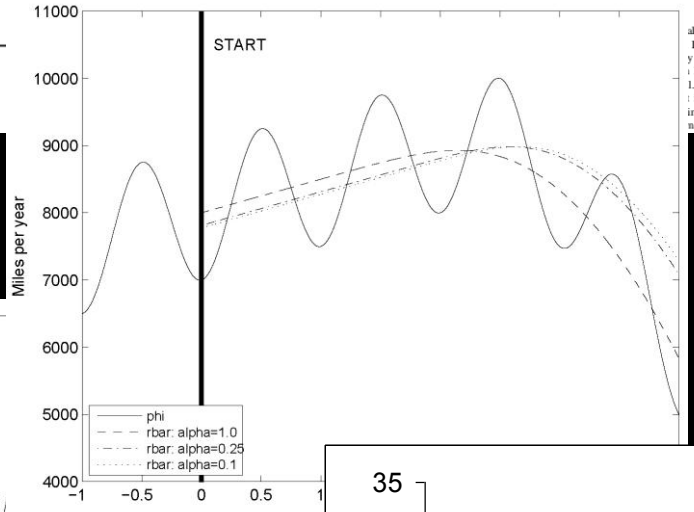
Available online at www.sciencedirect.com
ScienceDirect
Procedia Social and Behavioral Sciences 00 (2013) 1–16
Procedia
Social and Behavioral Sciences
www.elsevier.com/locate/procedia

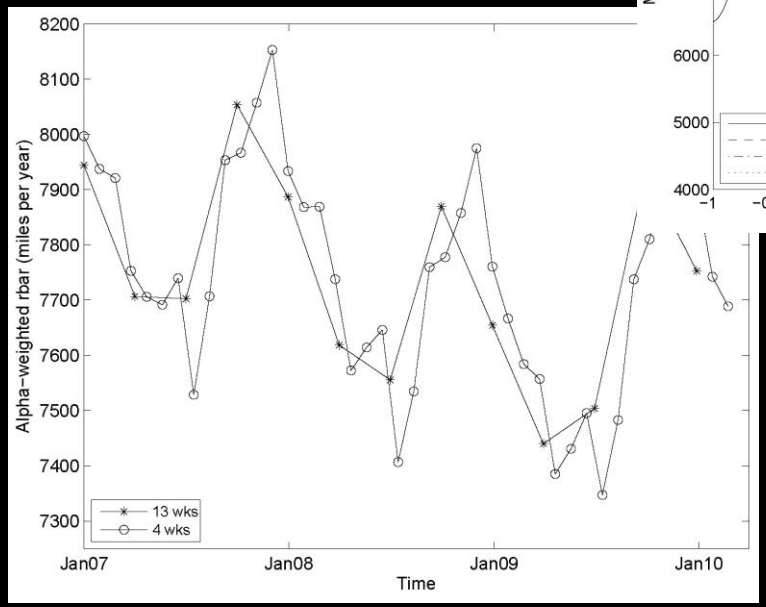
On the Estimation of Temporal Mileage Rates

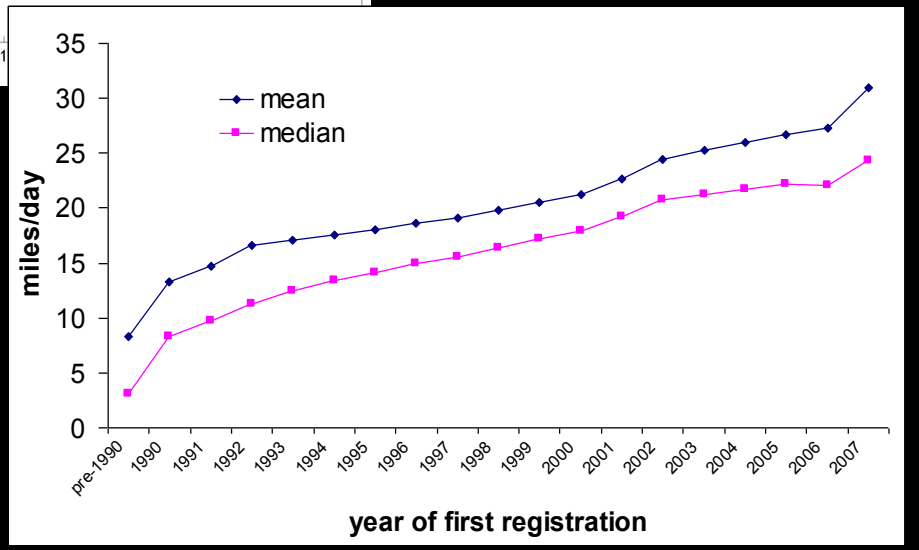
R. E. Wilson[a,*], J. Anable[b], S. Cairns[c,d], T. Chatterton[e], S. Notley[c], J. D. Lees-Miller[a]

[a]Transport and Mobility Modelling Group, University of Bristol, UK
[b]Centre for Transport Research, University of Aberdeen, UK
[c]TRL, UK
[d]Centre for Transport Studies, University College London, UK
[e]Air Quality Management Centre, University of the West of England, UK

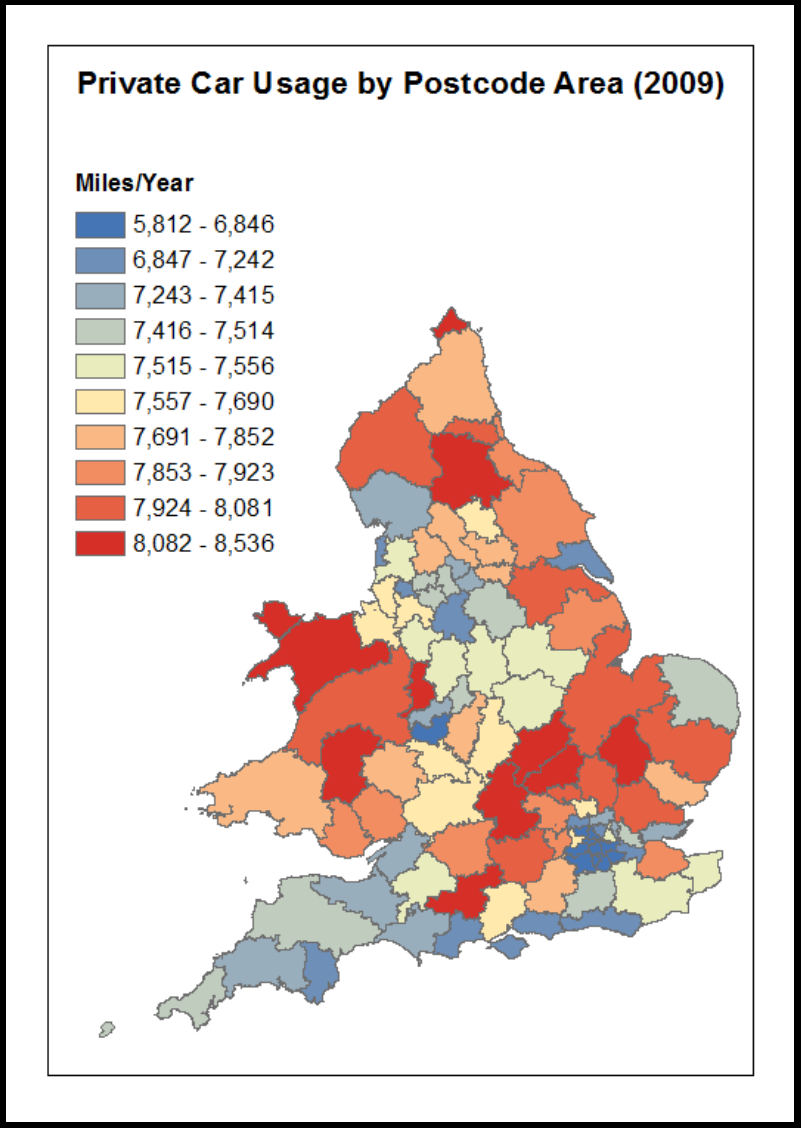
al and computational techniques are developed for the analysis of annual MOT (roadworthiness) test data Department for Transport has placed in the public domain. This paper focusses on the development of y which has the potential to estimate fine-scale temporal variations (e.g., monthly) in vehicle mileage at level, that we call the *spot rate* — derived from coarse-scale (e.g., annual) mileage data at an individual l. Due to the availability of data, the focus is on the UK situation, but the theory has applications to internationally, where odometer readings of individual vehicles are monitored on an occasional basis. ime-stepping schemes are derived from the theory and are tested on synthetic data to permit comparison n ground-truth mileage rate. It is found that for practical applicability, the methods need to pre-process data

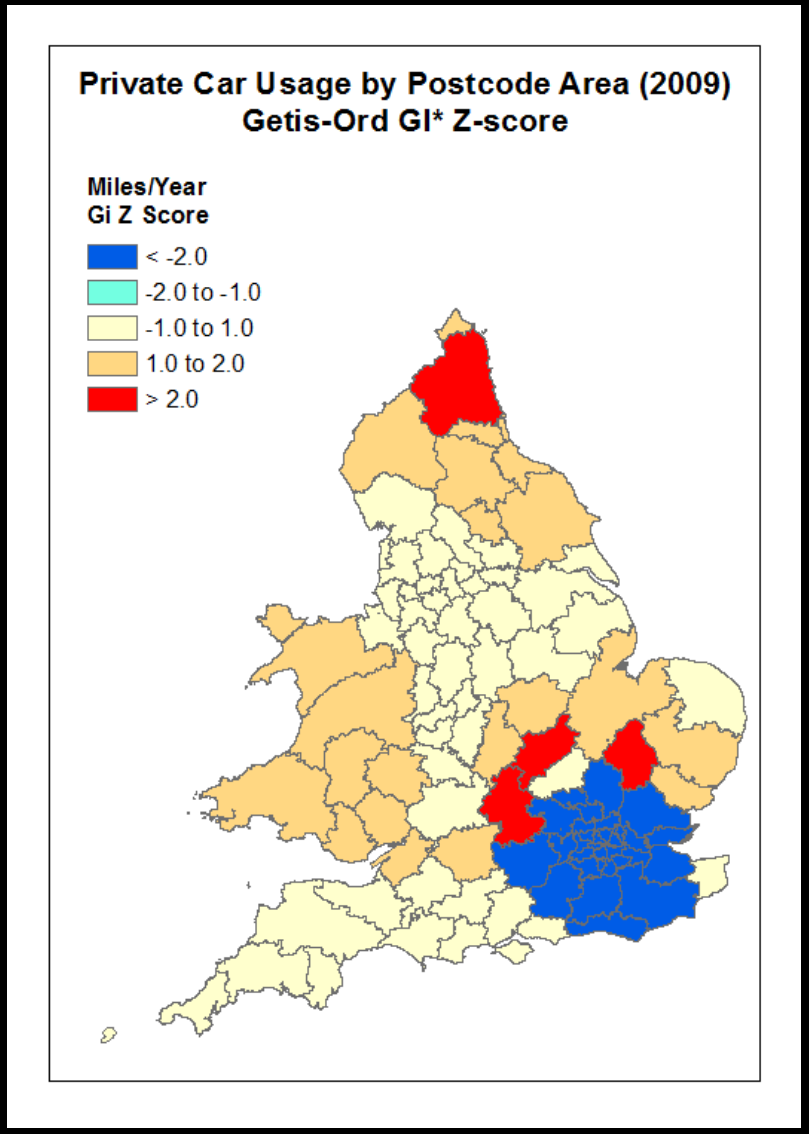




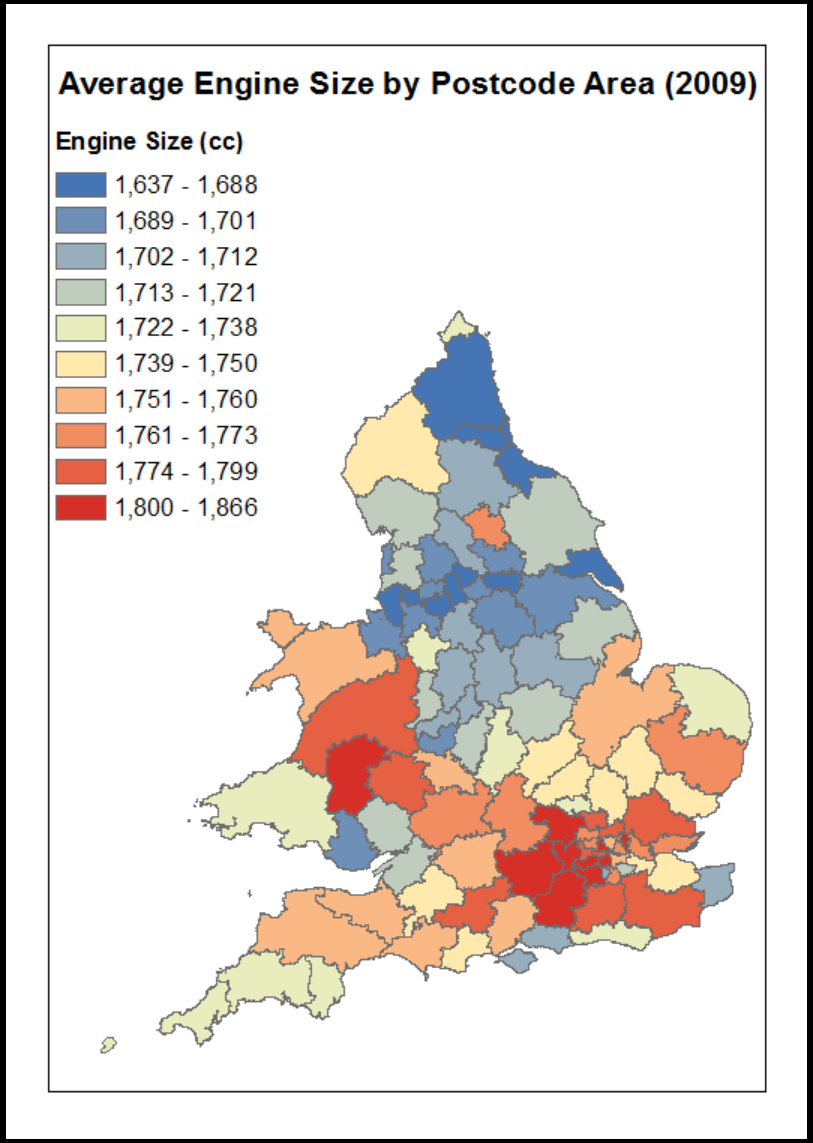


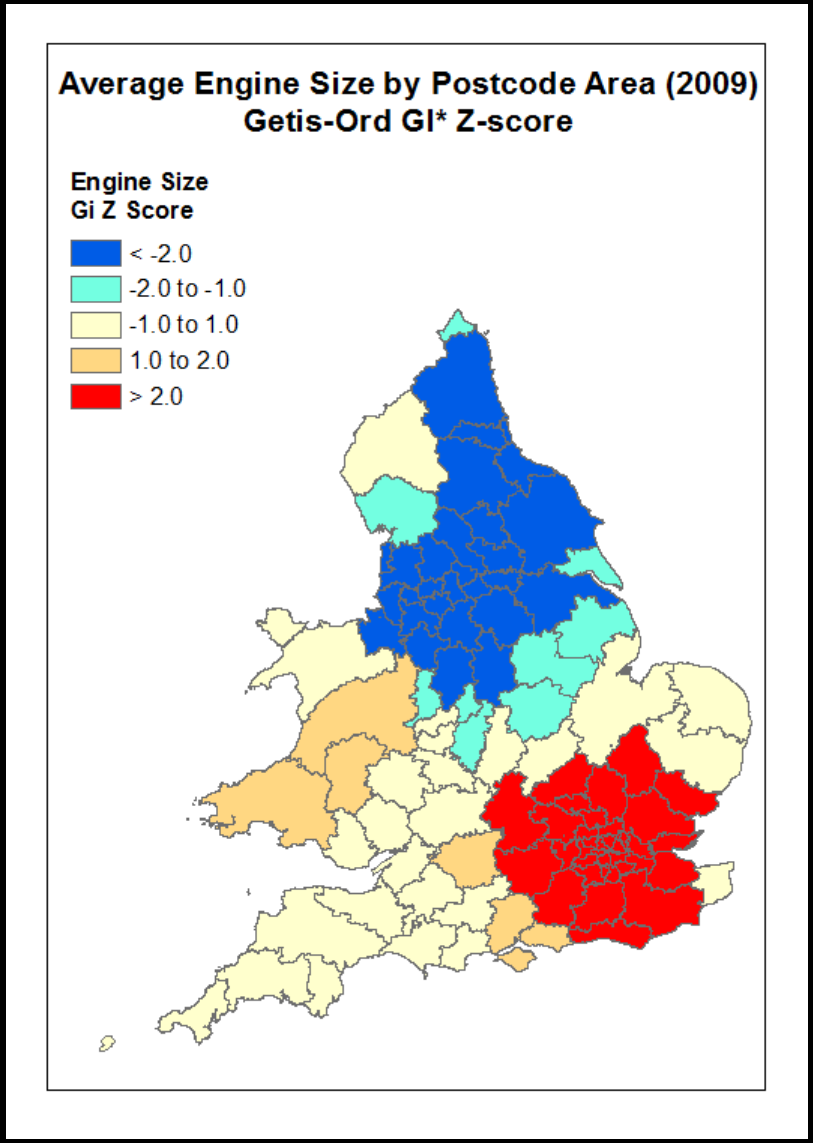
Average Miles per Vehicle per Year



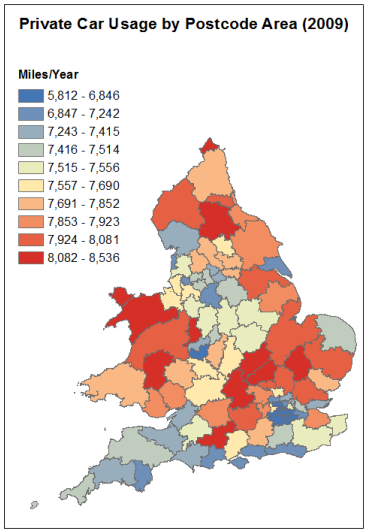


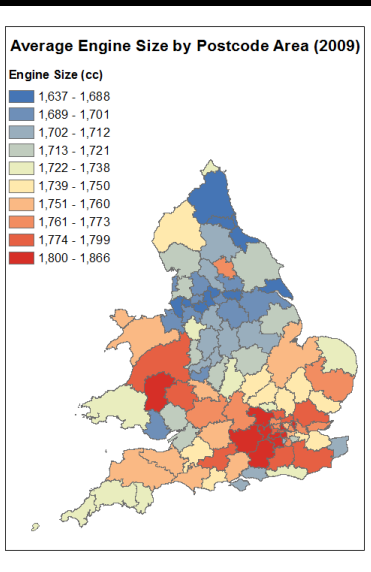
Average Engine Size per Vehicle

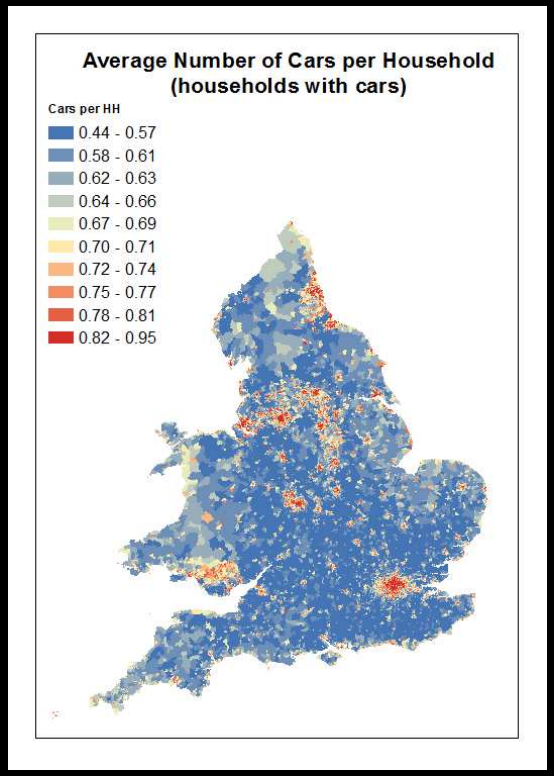


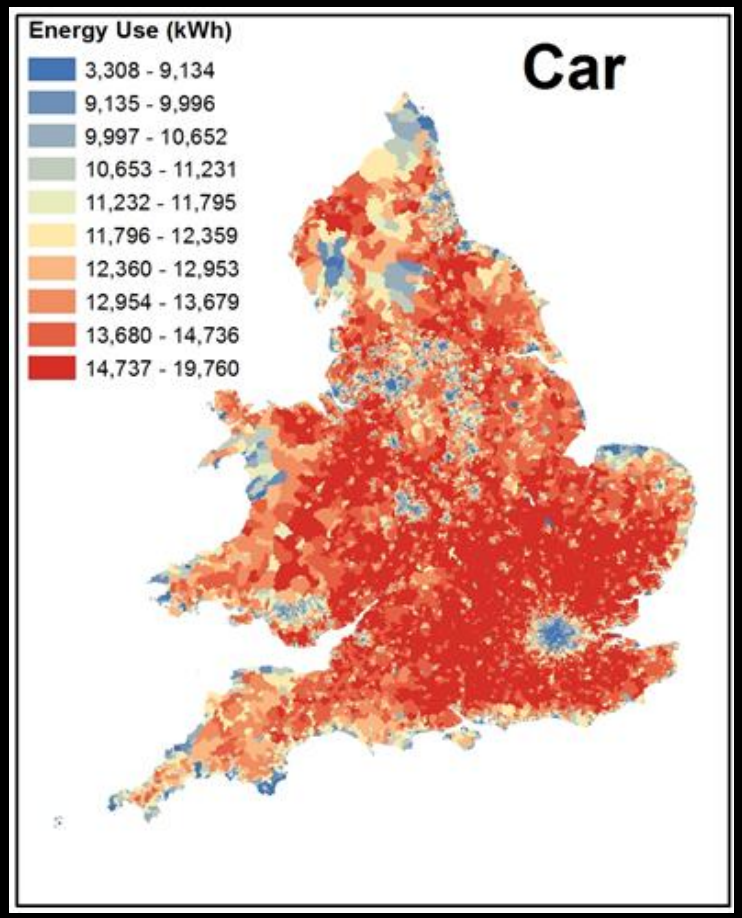


Miles + Eng.Size + Fuel + Cars per HH

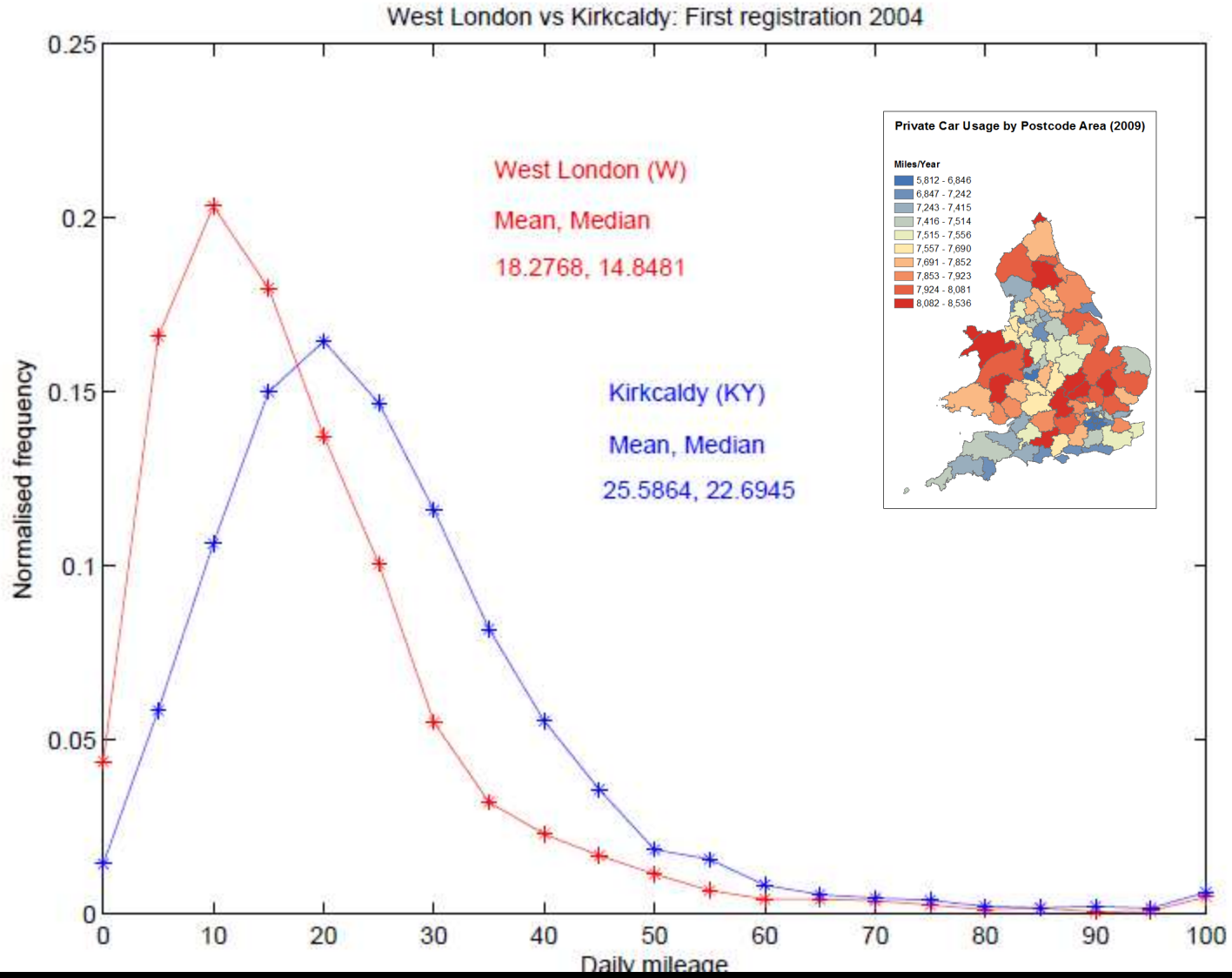




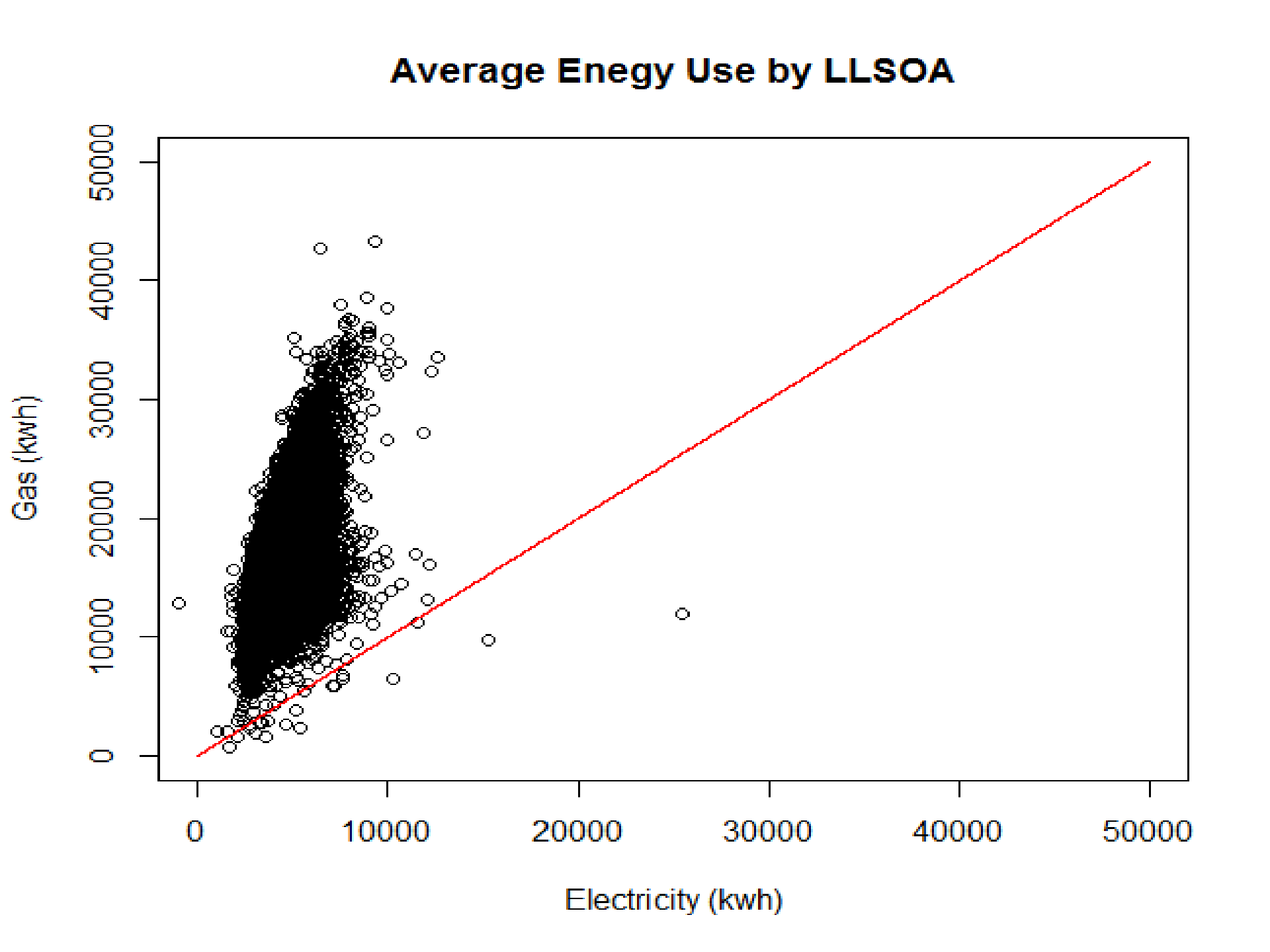


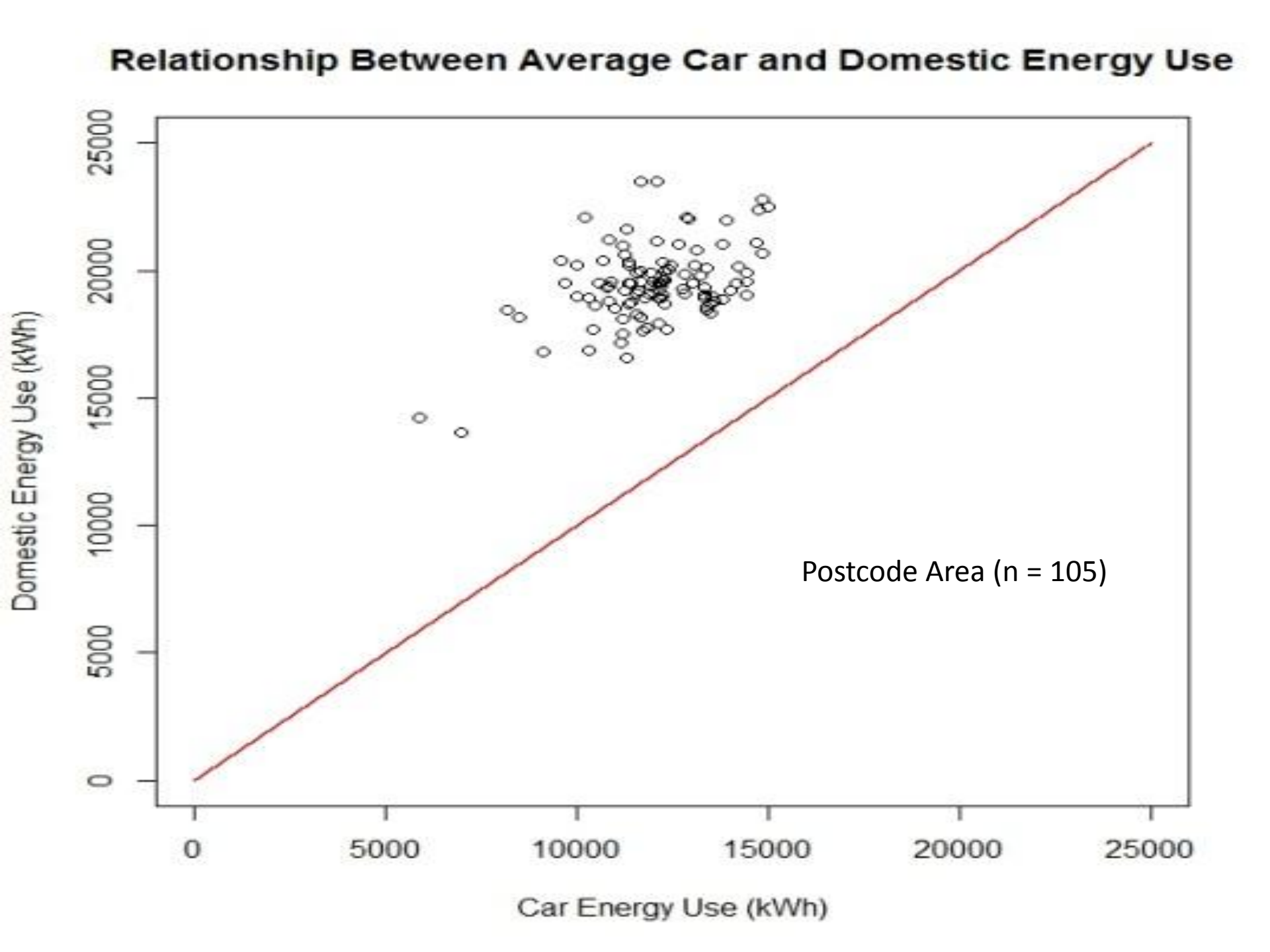


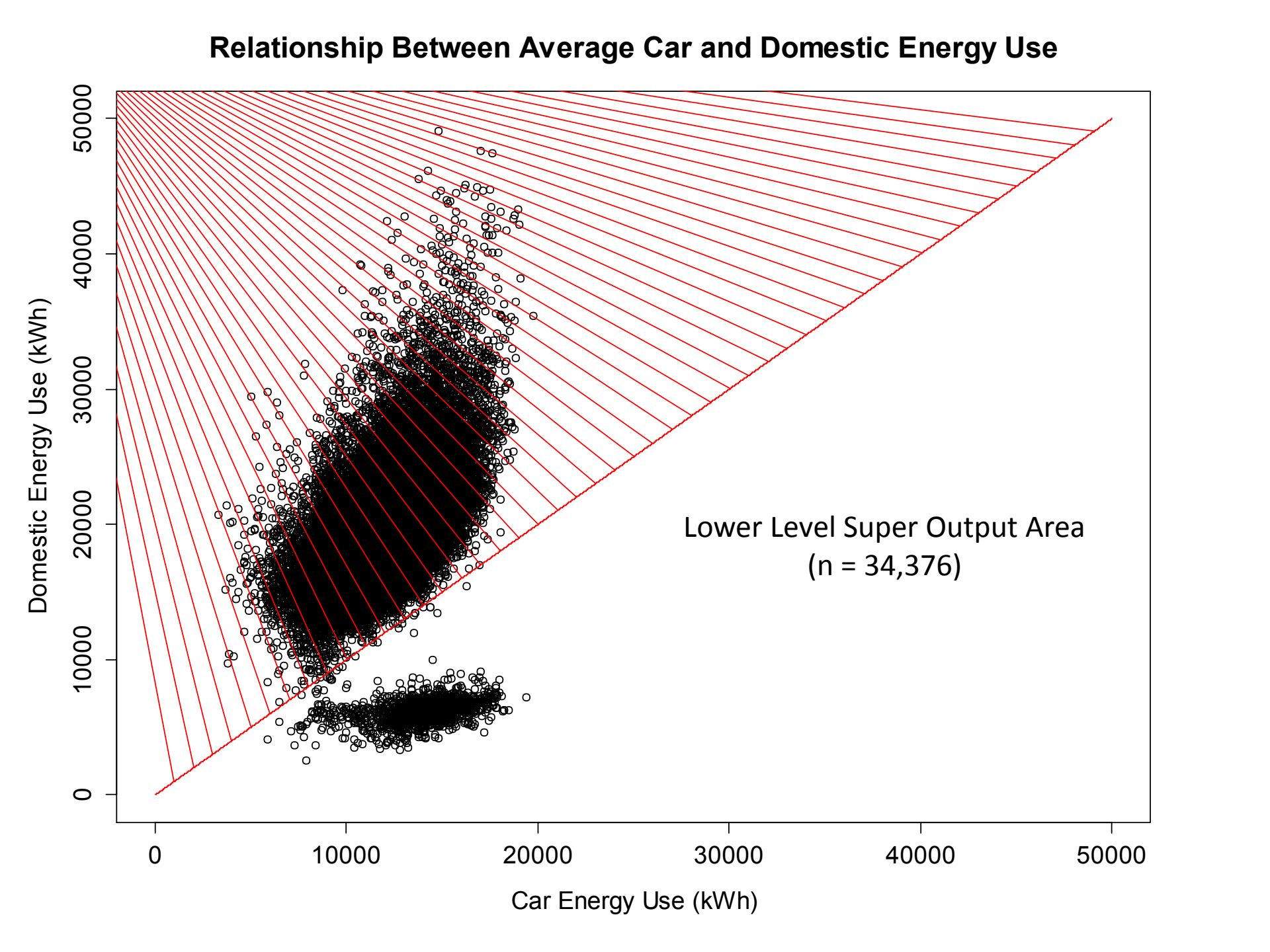
Mileage distributions: new(ish) vehicles

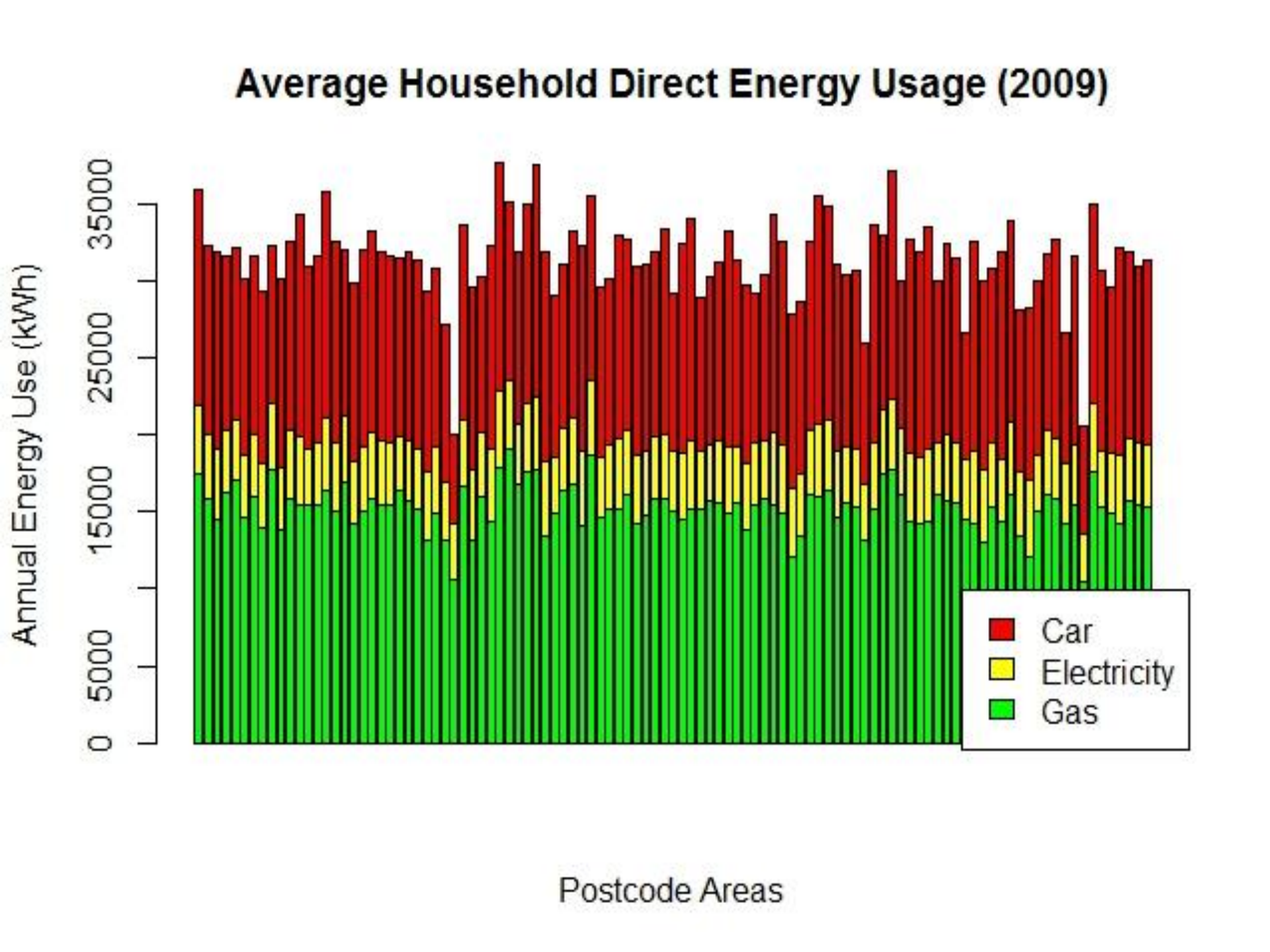



CO_2


Average Enegy Use by LLSOA
Gas (kwh)
0
10000
20000
30000
40000
50000
Electricity (kwh)
0
10000
20000
30000
40000
50000

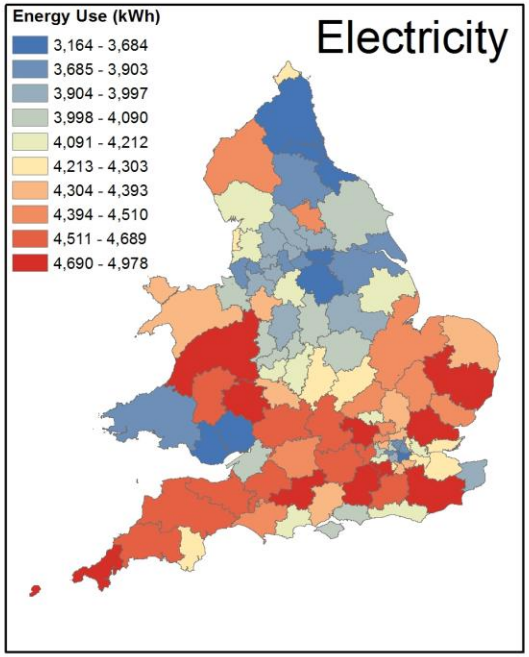

Relationship Between Average Car and Domestic Energy Use
Domestic Energy Use (kWh)
0
5000
10000
15000
20000
25000
Car Energy Use (kWh)
0
5000
10000
15000
20000
25000
Postcode Area (n = 105)

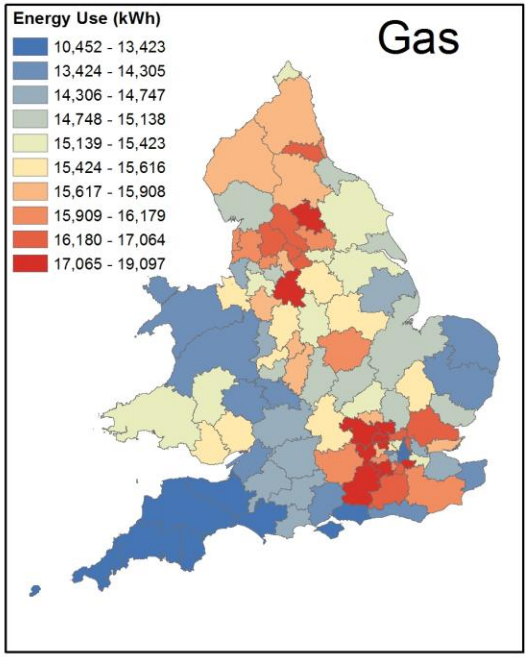

Relationship Between Average Car and Domestic Energy Use
Domestic Energy Use (kWh)
0
10000
20000
30000
40000
50000
Car Energy Use (kWh)
0
10000
20000
30000
40000
50000
Lower Level Super Output Area
(n = 34,376)

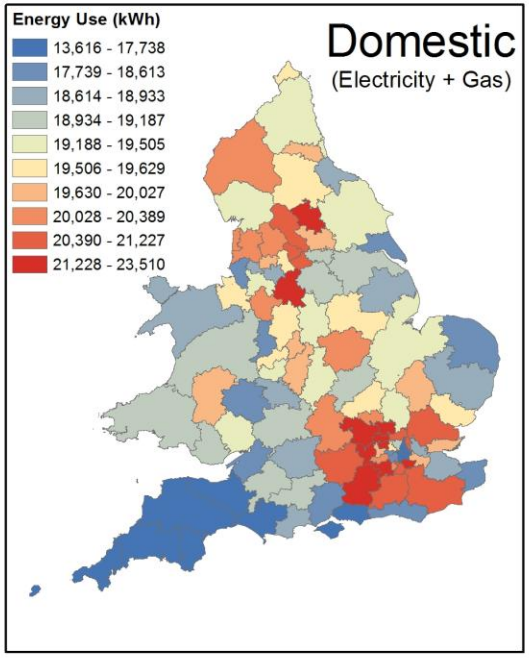

Average Household Direct Energy Usage (2009)
Annual Energy Use (kWh)
0
5000
15000
25000
35000
Car
Electricity
Gas
Postcode Areas

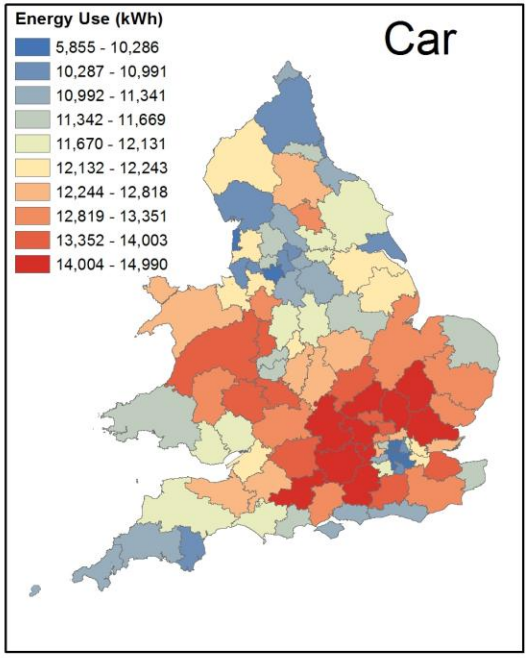
Average Household Direct Energy Usage 2009 by Postcode Area

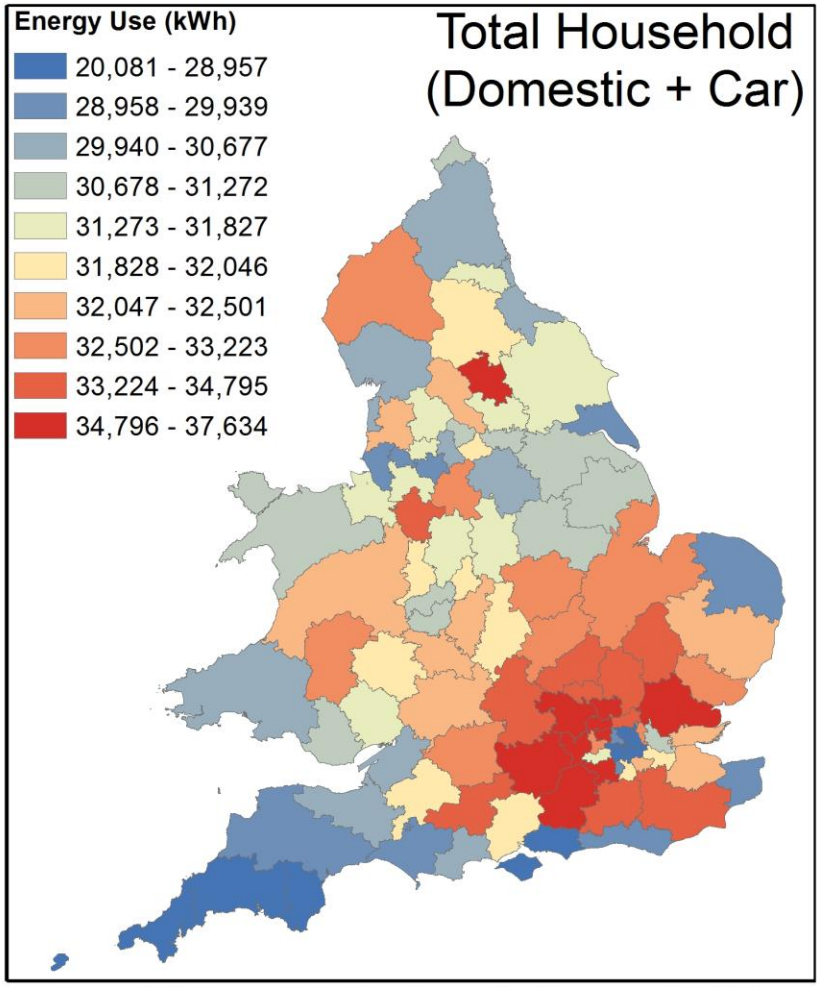
Legends indicate deciles





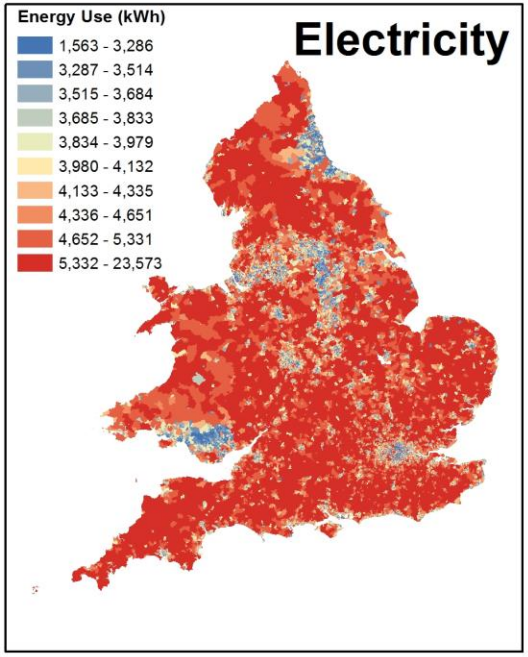


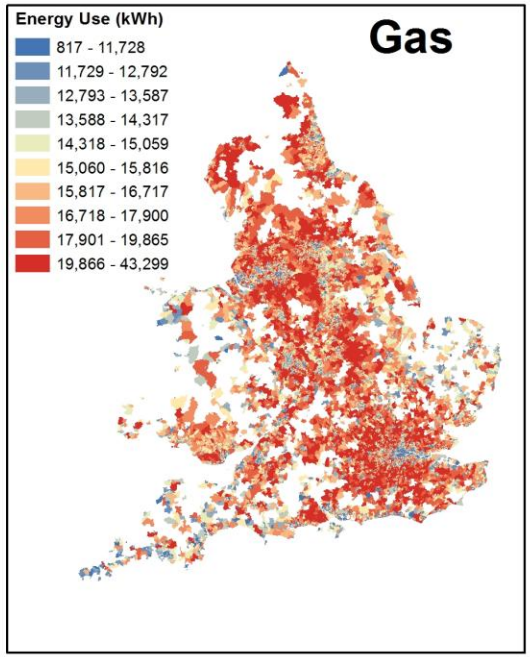


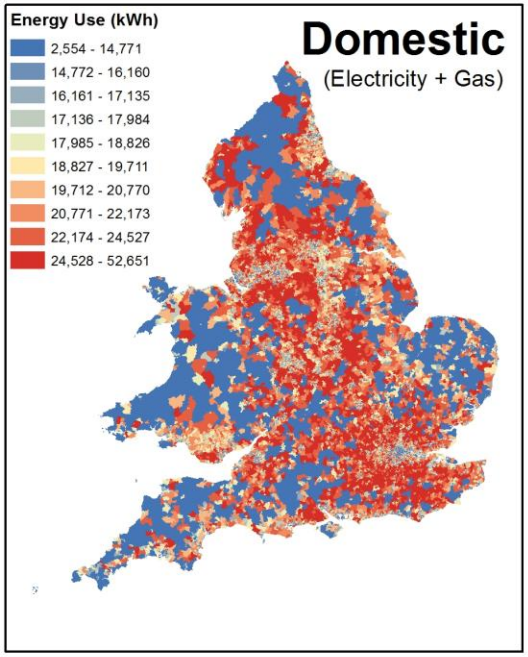


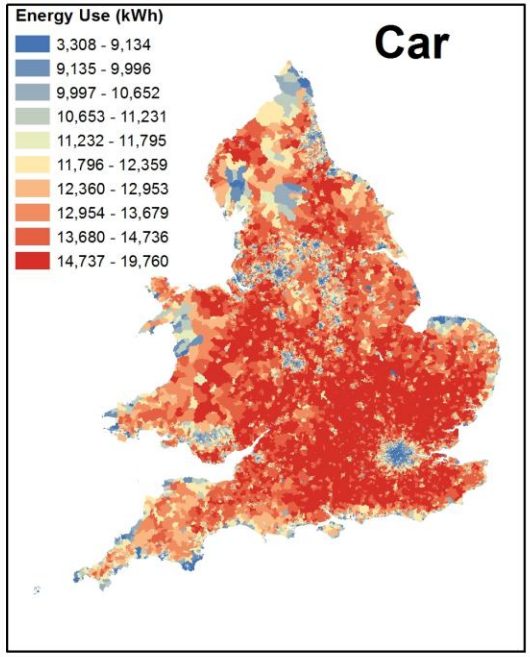
Average Household Direct Energy Usage 2009 by LLSOA

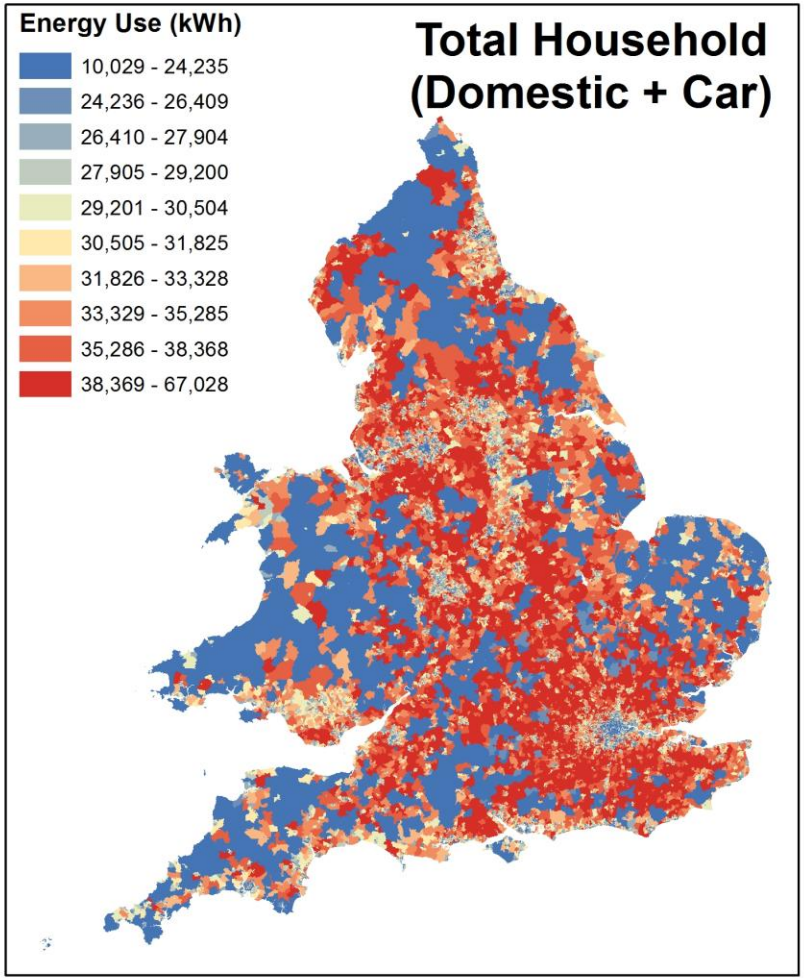
Legends indicate deciles

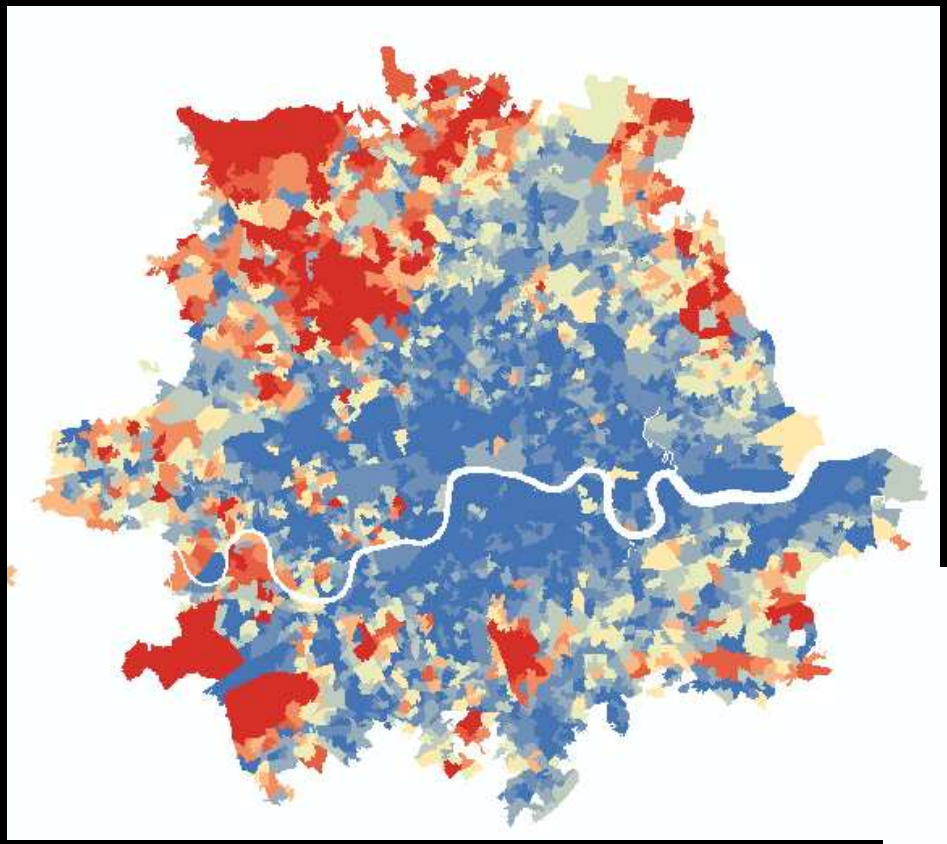






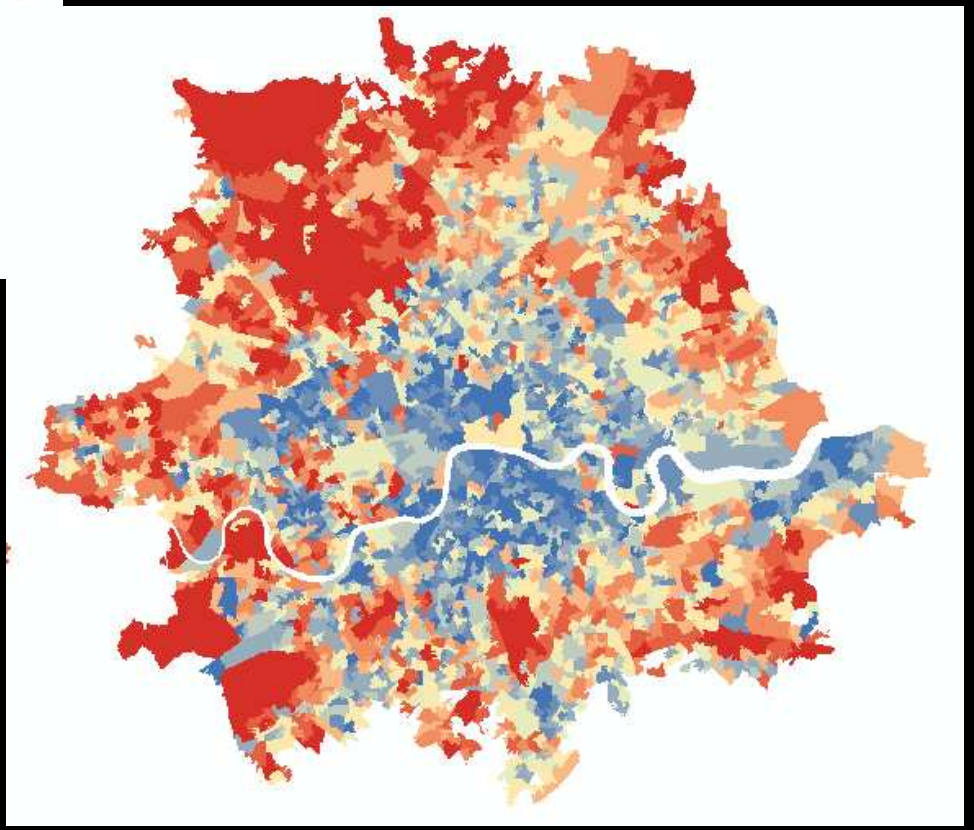




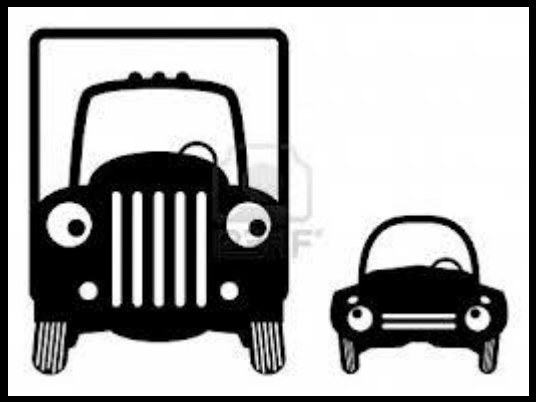


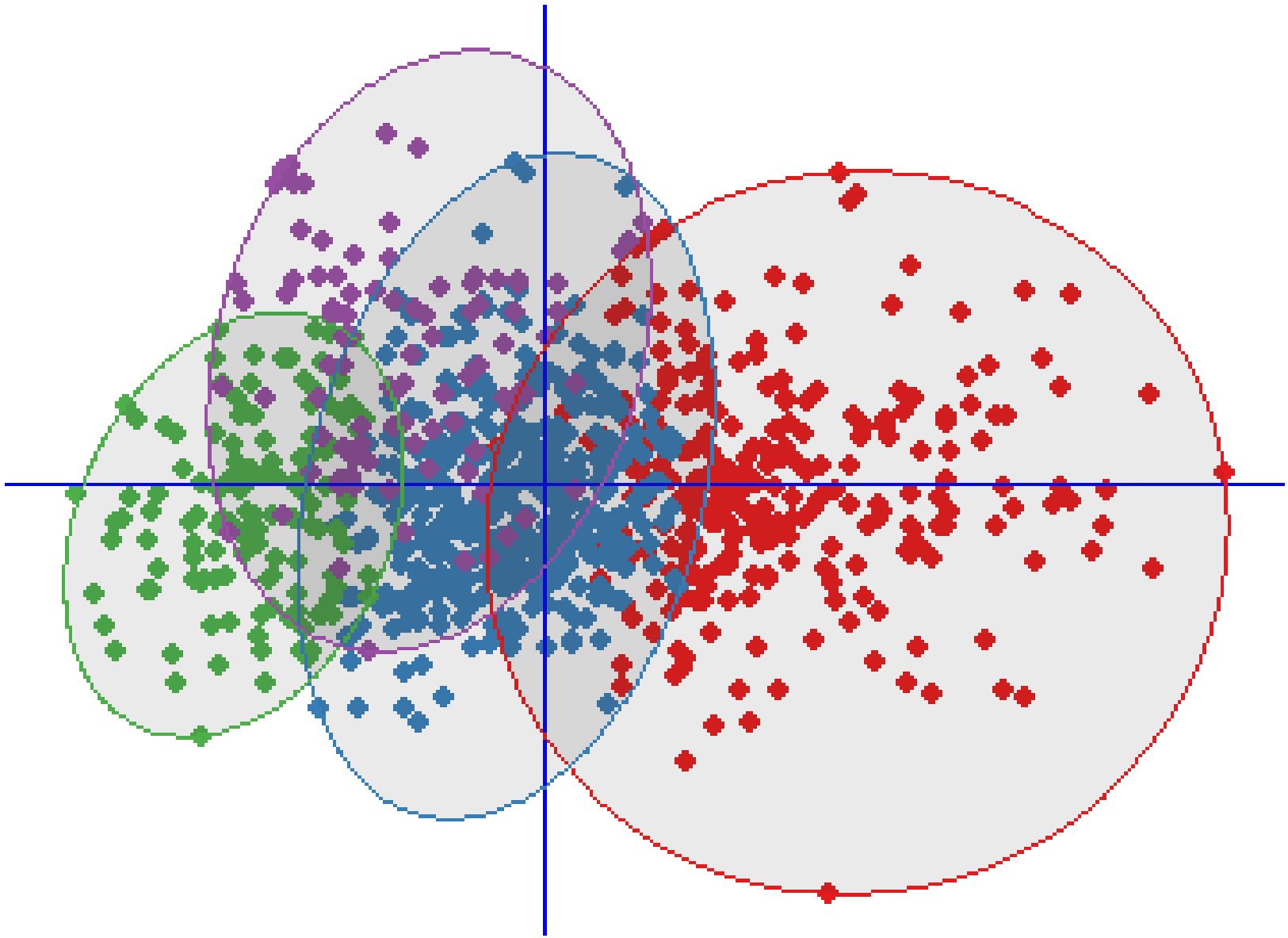
National deciles

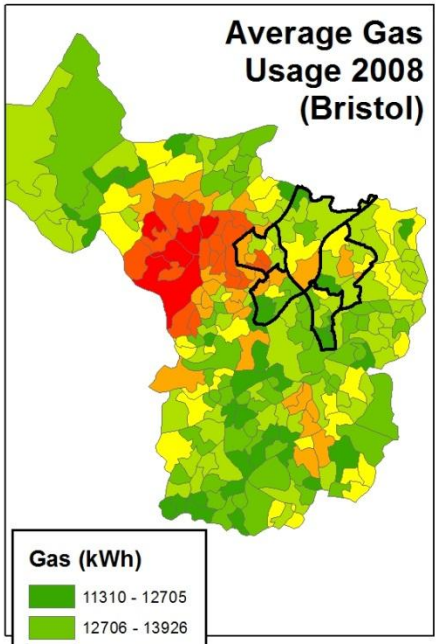
London deciles

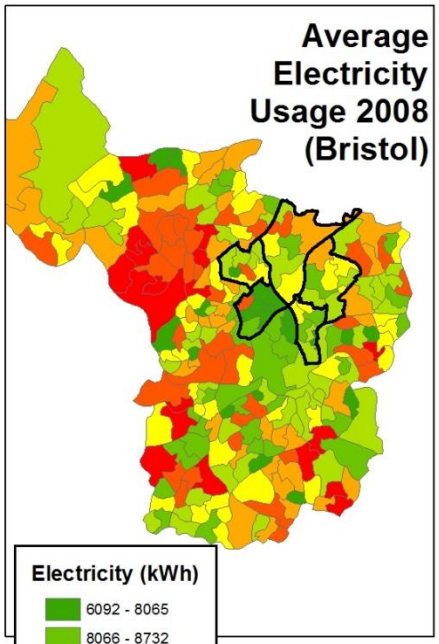


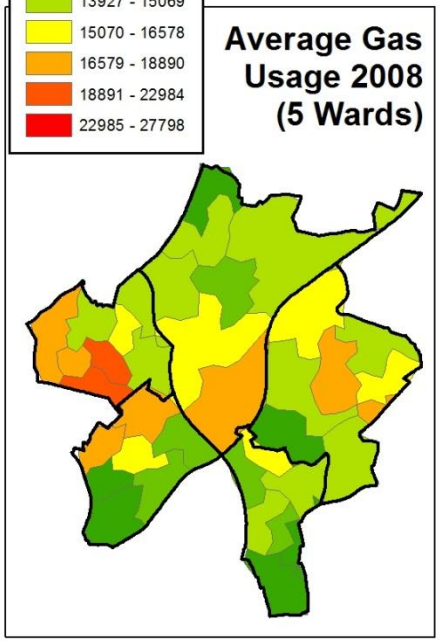

(M6)
Work
(A51)
Doctor's
(A534)
School
(A500)
Supermarket
5020)
Local Shops
A529)
A530
Station
A530

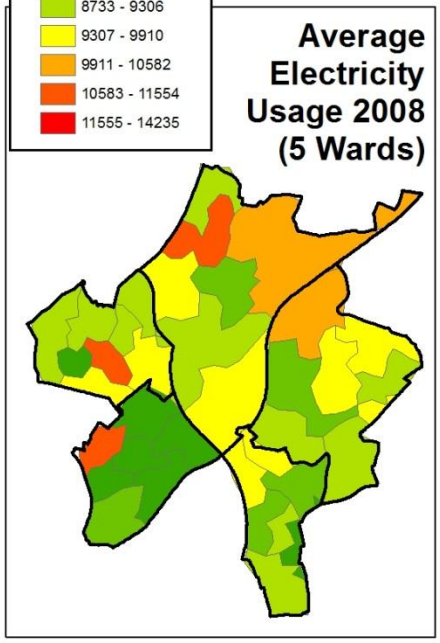


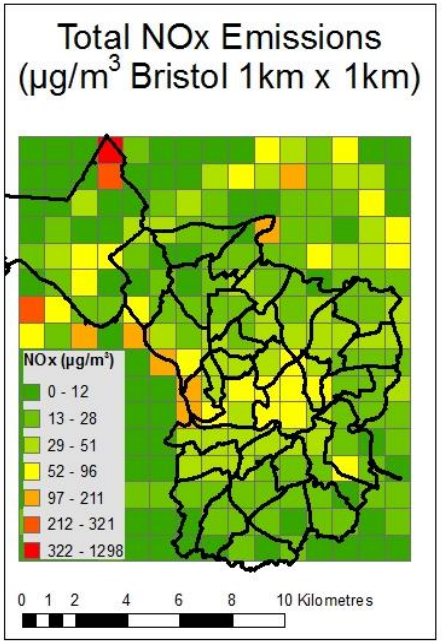


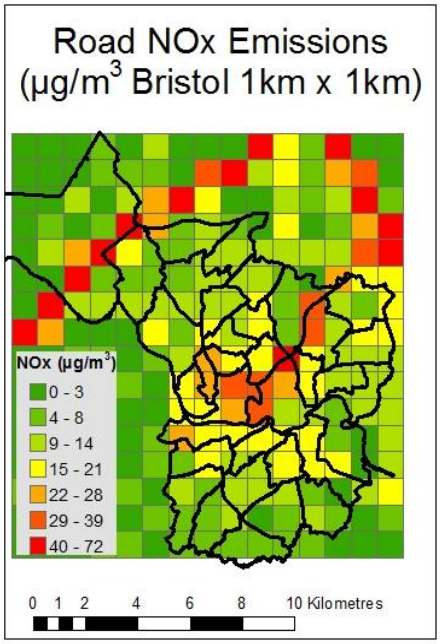


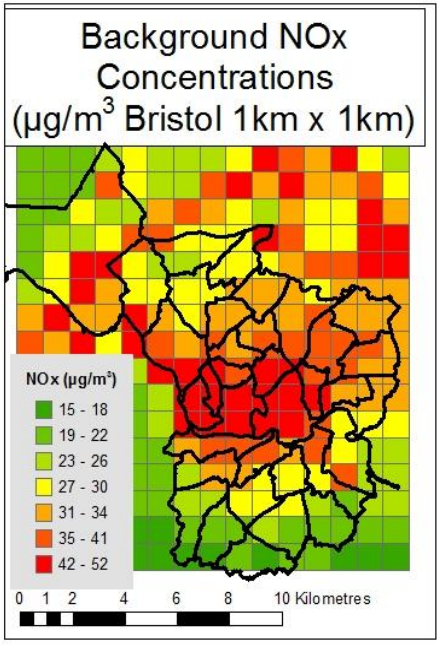












Residential emissions

Cold starts

Responsibility and exposure

?

http://www.decc.gov.uk/en/content/cms/statistics/energy_stats/regional/mlsoa_llsoa/mlsoa_llsoa.aspx

http://naei.defra.gov.uk/data_warehouse.php
http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

Tools for Policy Evaluation

Getting Somewhere Sally Cairns

SUSTAINABLE TRAVEL TOWNS SHOW TRAFFIC REDUCTION POTENTIAL

What really changes when measures get implemented?

Summary

- Increasing understanding of social patterns of energy use and emissions
- Better targeting of measures and messages
- Possibility of creating new tools to provide LAs with access to these large, complex datasets
- We want to engage with LAs to:
  1. Identify how data might be useful
  2. Provide local knowledge for case studies

Thank you!

Contact me at: tim.chatterton@uwe.ac.uk

tinyurl.com/MOTproject