GIS Association of Japan 地理情報システム学会

GIS Day in KANSAI 2010 （2010/10/23）

Kinugasa Campus
Ritsumeikan University
Kyoto, Japan

Representation & Visualization in GIS: Emerging Trends, New Methods

Michael Batty

University College London
www.casa.ucl.ac.uk

Outline

Pushing pictures – displaying and communicating data, spatial data – it's all about Web 2.0!

GMapCreator and ***ImageCutter***

MapTube: a kind of ***YouTube*** + ***Napster***

Pulling pictures – pulling spatial data – crowdsourcing, Survey Mapper

Seriously Capturing and Scraping Data: Twitter and online streaming, London Bikes

2D to 3D: GIS to CAD and back and on the web

The future – disseminating spatial data in multimedia –

We will begin by

Pushing pictures – displaying and communicating data, spatial data – it's all about Web 2.0!

GMapCreator and ***ImageCutter***

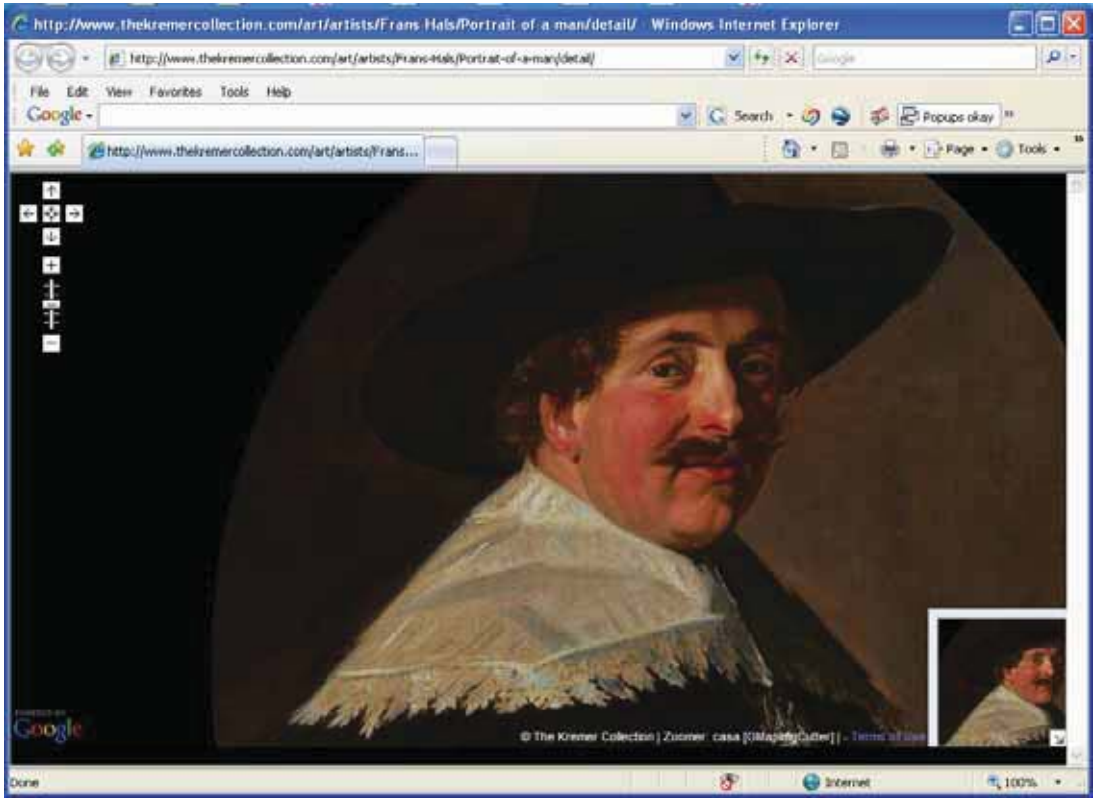
MapTube: a kind of ***YouTube*** + ***Napster***

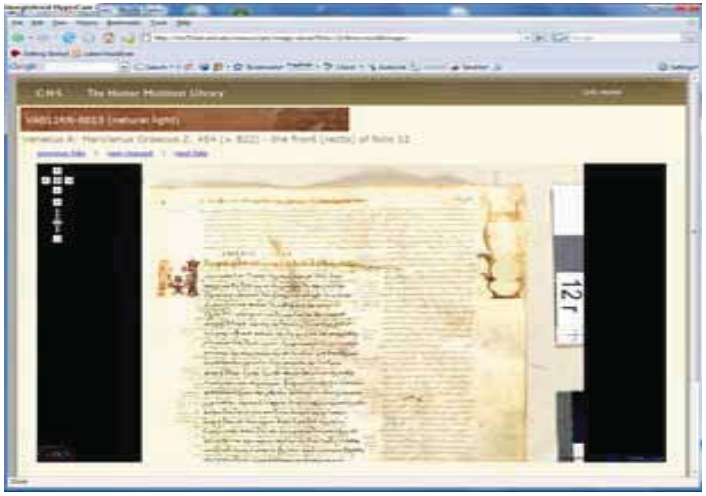
Using Maps to Visualize Pictures

Tooth courtesy of
Johan Lundin
Biomedical Informatics Research Group
Department of Oncology
University of Helinski
http://www.webmicroscope.net/

The Kremer Collection

http://www.thekremercollection.com/



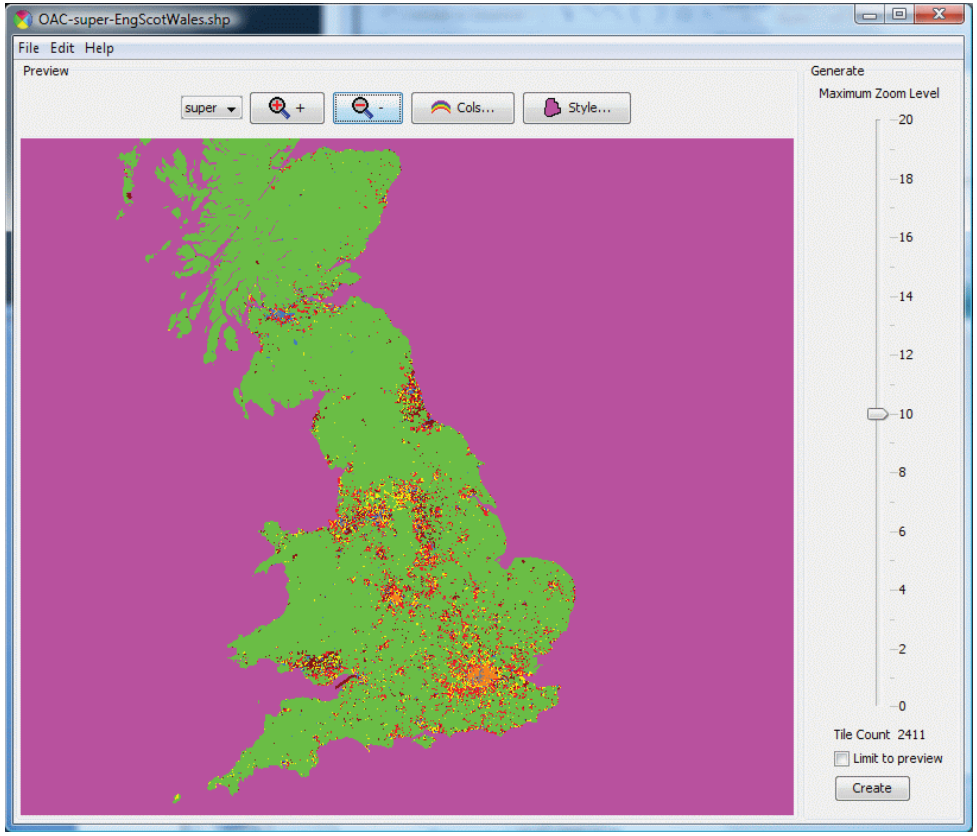


http://chs75.harvard.edu/manuscripts/

One of my key points in this talk is that software being developed for a particular spatial application often easily generalises to a quite different one ….. But let me first outline my talk before elaborating

GMapCreator and ***ImageCutter***

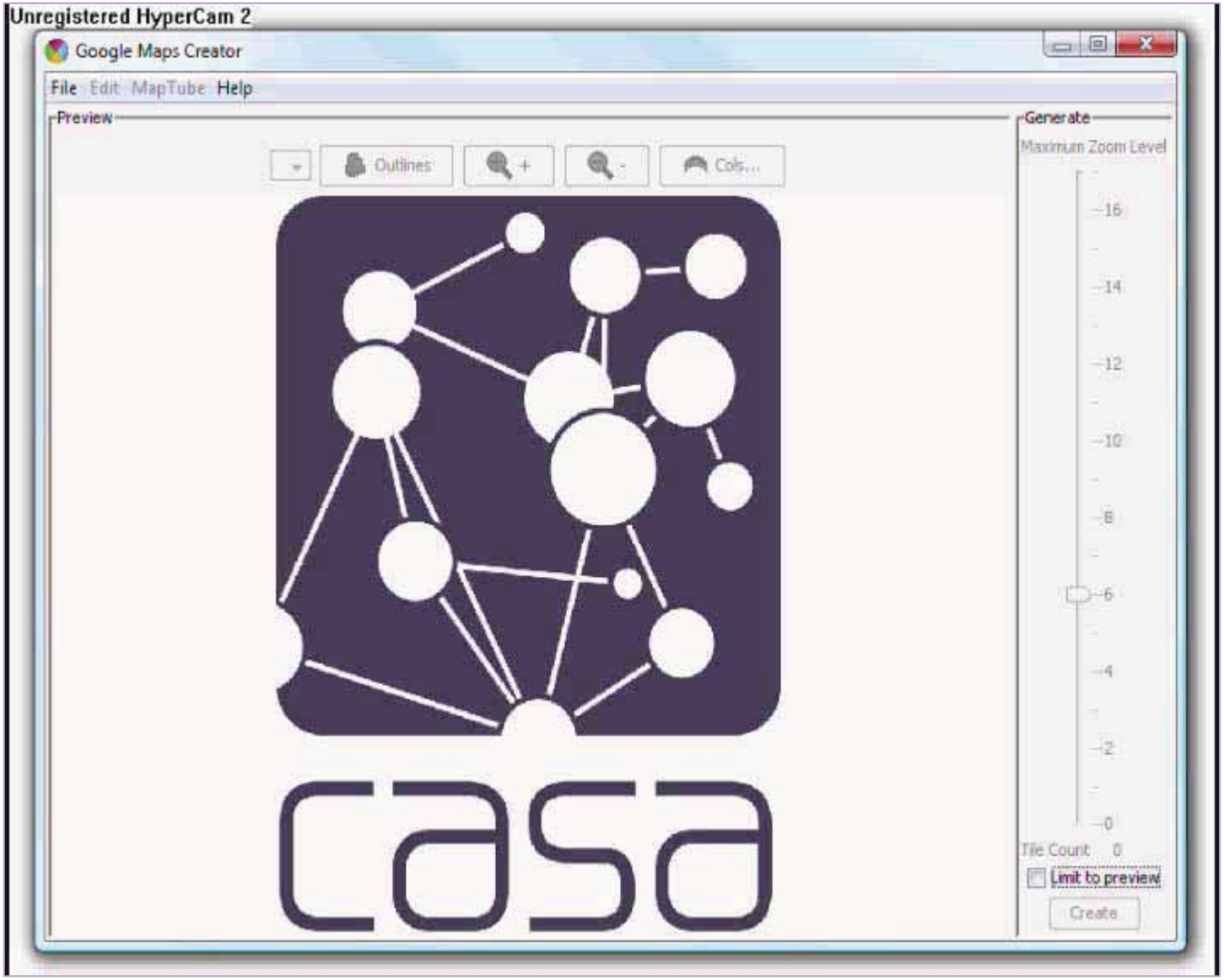
The ***Google Map Creator*** creates ***Google Maps*** websites from thematic data contained in shapefiles.



It effectively layers your map on top of a ***Google Map*** or the ***Google Map***

For audiences other than yourselves, I always have to make the point that a map is not a picture – it is a bunch of vector geometries and a set of attributes – and a shape file is a proprietary but widely used format by ESRI

Let us see how it works


Unregistered HyperCam 2
Google Maps Creator
File Edit MapTube Help
Preview
Outlines
Cols...
Generate
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16
14
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6
4
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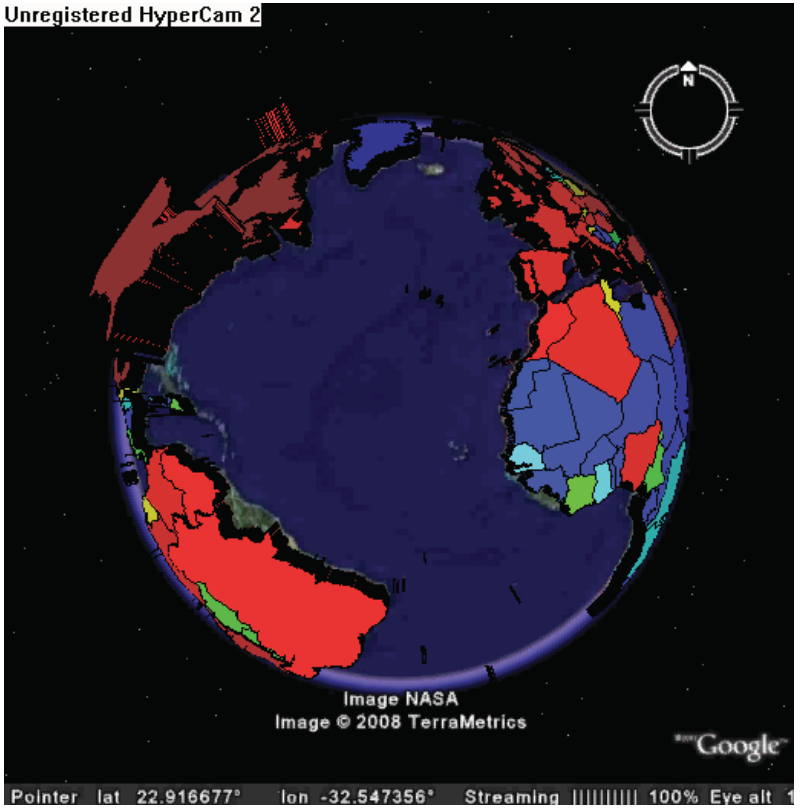
Tile Count 0
Limit to preview
Create
casa

We can do the same sort of thing in 3D of course with ***GEarthCreator*** – the key is to convert the shapefiles to KML files – and there are many other maphacks using similar open map bases like ***Open Street Map***



From all of this we have devised an open resource for maps called ***MapTube***


CASA Centre for Advanced Spatial Analysis UCL - CASA News -
http://www.casa.ucl.ac.uk/
File Edit View Favorites Tools Help
Google
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casa
[+] ABOUT
[+] EVENTS
[+] PEOPLE
[+] BLOGS
[+] WEBSITES
[+] PUBLICATIONS
[+] RESEARCH
[+] MOVIES
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DUEM CA Model
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Image Cutter
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Photo Overlay
Rank Clocks
Space Syntax
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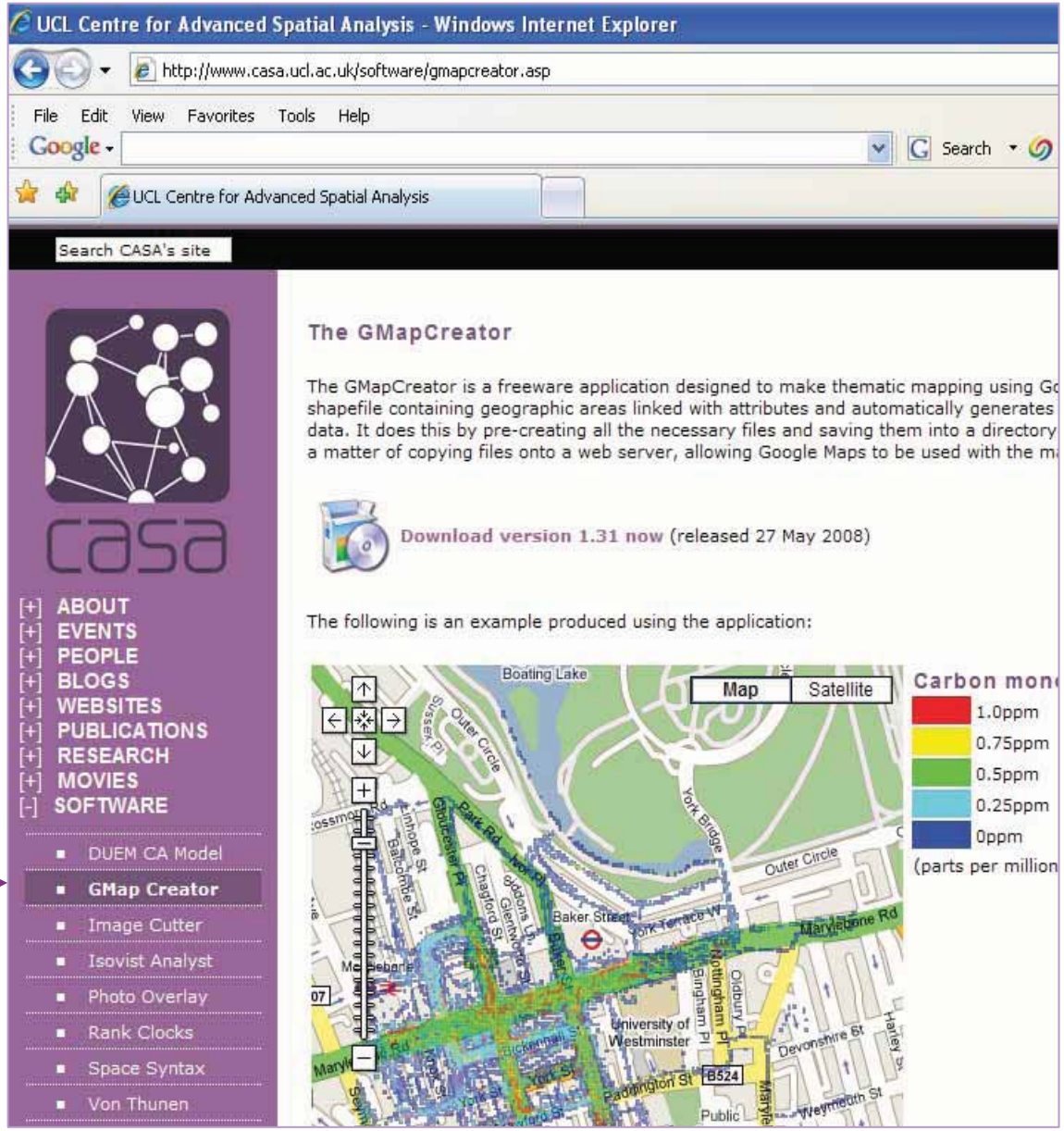
UCL Centre for Advanced Spatial Analysis - Windows Internet Explorer
http://www.casa.ucl.ac.uk/software/gmapcreator.asp
File Edit View Favorites Tools Help
Google
Search
UCL Centre for Advanced Spatial Analysis
Search CASA's site
casa
[+] ABOUT
[+] EVENTS
[+] PEOPLE
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[+] WEBSITES
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DUEM CA Model
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Image Cutter
Isovist Analyst
Photo Overlay
Rank Clocks
Space Syntax
Von Thunen
The GMapCreator
The GMapCreator is a freeware application designed to make thematic mapping using Go
shapefile containing geographic areas linked with attributes and automatically generates
data. It does this by pre-creating all the necessary files and saving them into a directory
a matter of copying files onto a web server, allowing Google Maps to be used with the ma
Download version 1.31 now (released 27 May 2008)
The following is an example produced using the application:
Map
Satellite
Boating Lake
Outer Circle
York Bridge
Baker Street
Marylebone Rd
University of Westminster
Carbon mono
1.0ppm
0.75ppm
0.5ppm
0.25ppm
0ppm
(parts per million

MapTube: a kind of ***YouTube*** + ***Napster***

Let me explain: every time someone downloads our software, there is a high probability they make a map.

As it sits on a common base – a ***Google Map*** – if they create the map of some place and someone else creates another map of the same place, it would be nice if we or they could compare them as layers

However, in the UK map bases are copyrighted – you can done for copying OS map data and it is serious –

So we ask the user not to put their map created from our software on our site, but to give us their URL where their map is and thus ***MapTube*** is a bunch of pointers to URLs - this is what it looks like with demo

http://www.maptube.org/

Live Search

File Edit View Favorites Tools Help

MapTube

Page Tools

home about login search help casa

MAPTUBE
a place to put maps

Welcome to MapTube

MapTube is a free resource for viewing, sharing, mixing and mashing maps online. Created by UCL's Centre for Advanced Spatial Analysis, users can select any number of maps to overlay and view.

QuickStart

Click any map below to view it. To select a combination of maps, use the Search page. More information is available in the Help section.

Map of the Week

Big Mac Index

This map illustrates how the price of a Big Mac varies across the world. View the Big Mac Index here

Popular Maps | Recently Viewed | Latest Uploads

Showing records 1 to 12 of 128:

Mapping the Credit Crunch

Radio 4: Mapping the Credit Crunch

more information

Viewed 15272 times

London Tube Map

A map of the London Underground with geographically correct station positions taken from wikimedia.

more information

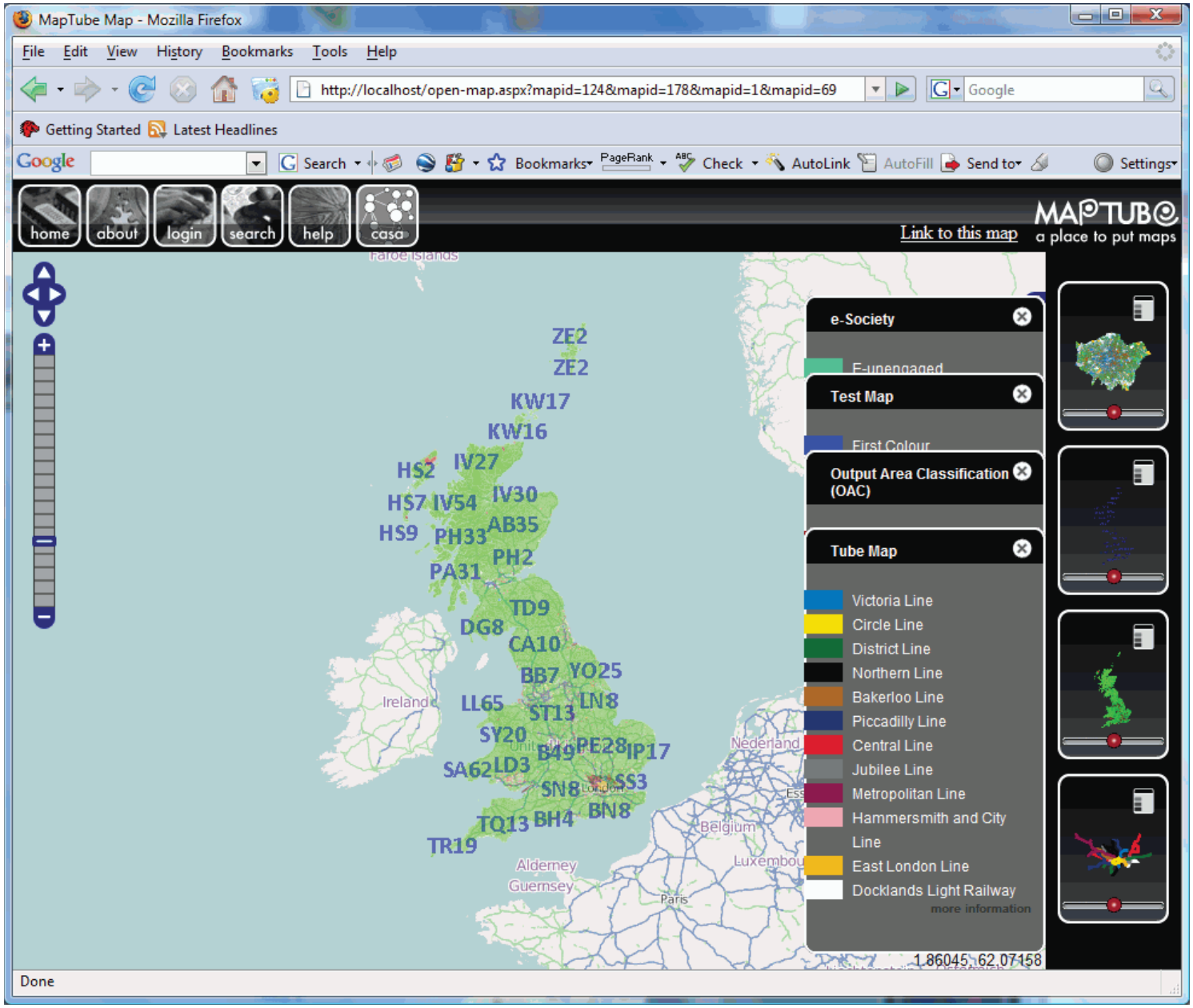
Viewed 7362 times

BBC Look East: Anti-social Behaviour

Mapping anti-social behaviour in the eastern counties in conjunction with BBC Look East.

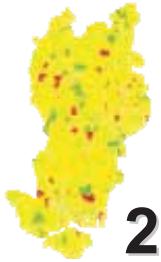
Global MacDonalds Big Mac Prices 2007

Illustrates the local price (in USD) of a MacDonalds BigMac in various countries round the world.

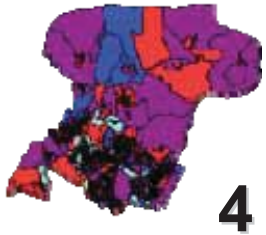

MapTube Map - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost/open-map.aspx?mapid=124&mapid=178&mapid=1&mapid=69
Getting Started Latest Headlines
home about login search help casa
Link to this map
MAPTUBE
a place to put maps
e-Society
E-unengaged
Test Map
First Colour
Output Area Classification (OAC)
Tube Map
Victoria Line
Circle Line
District Line
Northern Line
Bakerloo Line
Piccadilly Line
Central Line
Jubilee Line
Metropolitan Line
Hammersmith and City Line
East London Line
Docklands Light Railway
more information
ZE2
KW17
KW16
IV27
IV30
AB35
PH33
PH2
PA31
TD9
DG8
CA10
BB7
YO25
LN8
ST13
LL65
SY20
PE28
IP17
LD3
SA62
SS3
BN8
BH4
TQ13
TR19
Ireland
Nederland
Belgium
Luxembou
Alderney
Guernsey
Paris
1.86045, 62.07158
Done

Here are some of the user map data in/on **MapTube**

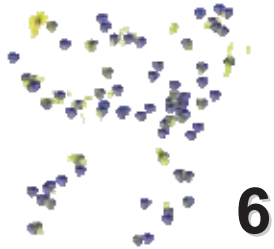

1


2


3

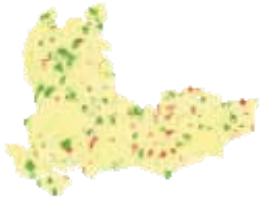

4


5


6

1. Knife Crime Update, **2.** SC IMD Score, **3.** SEC IMD Score, **4.** PCT Obesity, **5.** NO_2 Bristol, **6.** AGFC Wildlife

The data behind the knife crimes map (1) has been in the news the last few days after it emerged that the Government had manipulated the data.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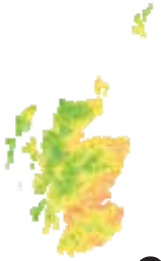
8


9


10


11

7. Southeast IMD, **8.** Southeast IMD (LSOA), **9.** Wild Land Quality Scotland, **10.** NSSeC L8 (never worked)%, **11.** CO_2 index

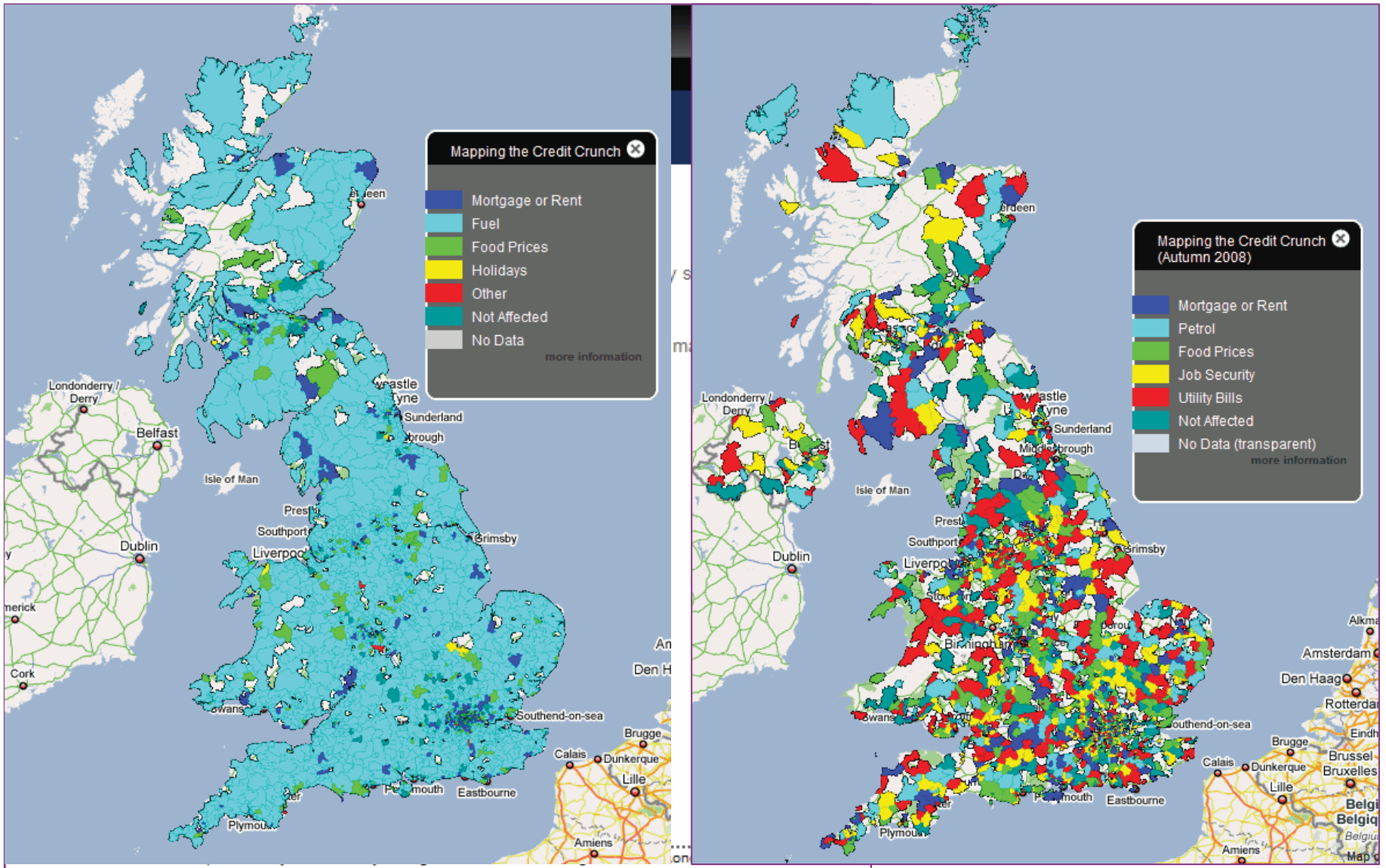
Pulling pictures – pulling spatial data – crowd-sourcing

We have turned all this around and basically used the system to record spatial responses to topical questions

We broadcast the questions through TV and radio and then ask users to respond and key in their post code – 7 digit in UK but actually only record postcode sector – first three or four digits

Then our server issues a request to scan the continually refreshed database and rebuilds the map on the fly so to speak, every half hour, using GMapCreator etc

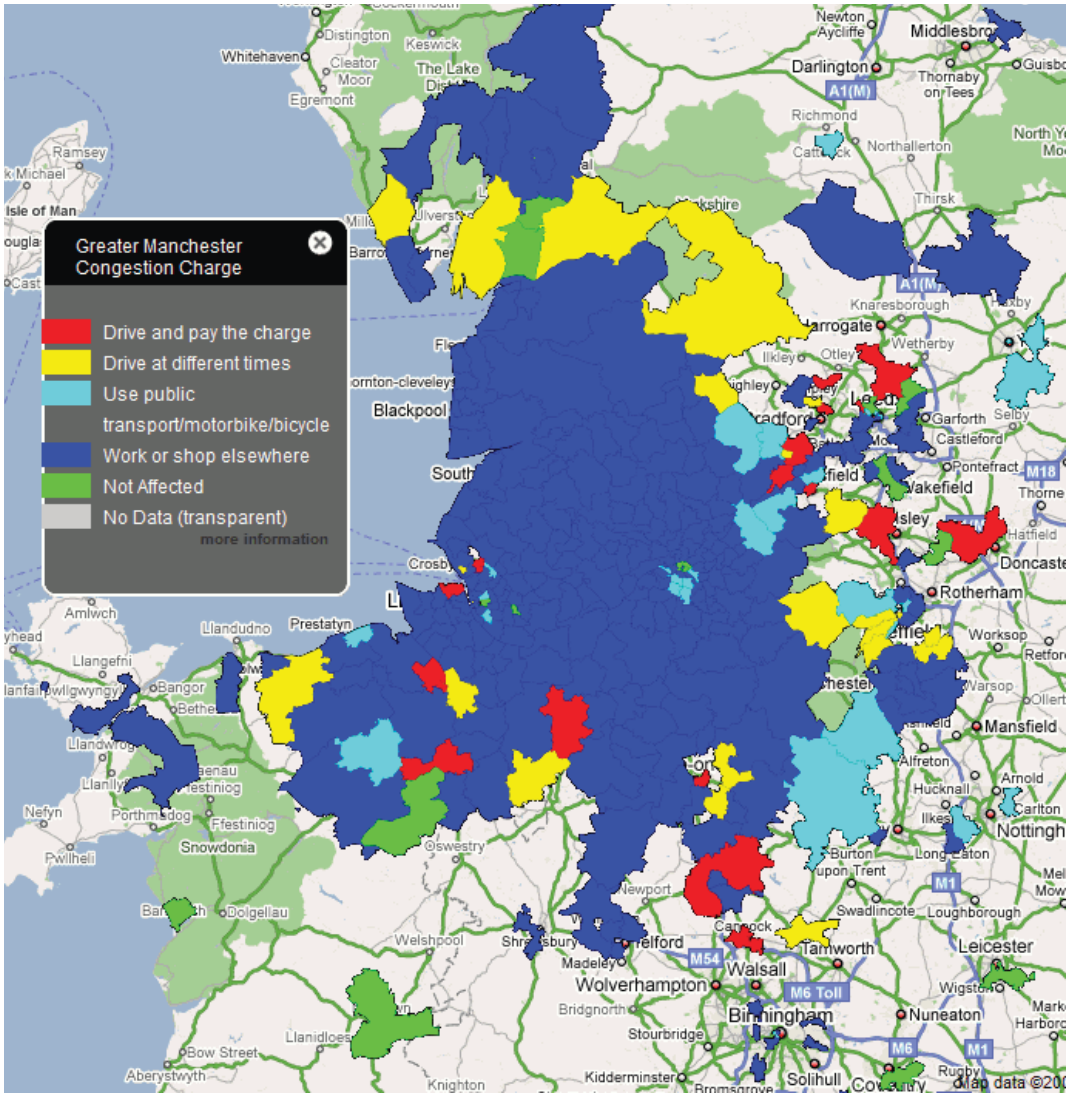
We have so far looked at the credit crunch, antisocial behaviour and the Manchester road pricing proposal


Mapping the Credit Crunch
Mortgage or Rent
Fuel
Food Prices
Holidays
Other
Not Affected
No Data
more information
Mapping the Credit Crunch (Autumn 2008)
Mortgage or Rent
Petrol
Food Prices
Job Security
Utility Bills
Not Affected
No Data (transparent)
more information
Londonderry / Derry
Belfast
Dublin
Isle of Man
Sunderland
Southport
Grimsby
Liverpool
Southend-on-sea
Brugge
Calais
Dunkerque
Lille
Eastbourne
Plymouth
Amiens
Amsterdam
Den Haag
Rotterdam
Brussels
Bruxelles
(0)20 7679 1782 - Fax +44 (0)20 7813 2843 - Email casa@ucl.ac.uk Copyright © 1999-2008 UCL

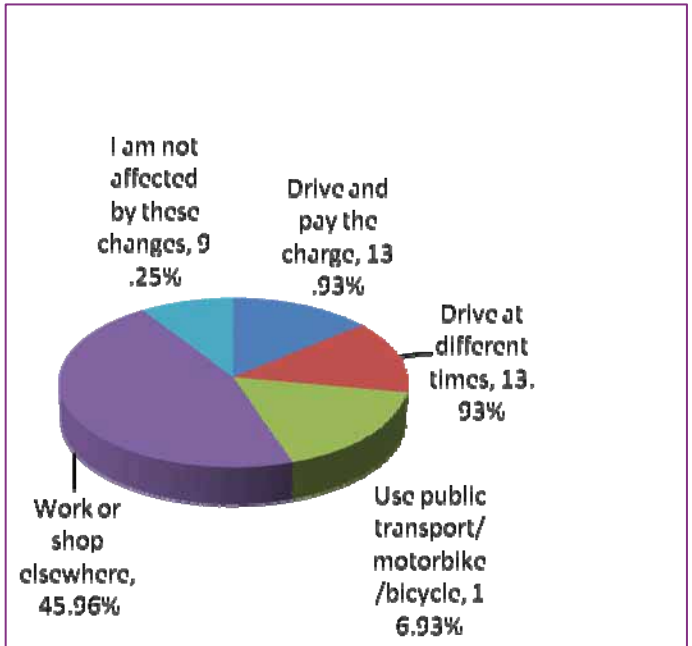
BBC Look East: Anti-Social Behaviour

http://www.maptube.org/lookeast

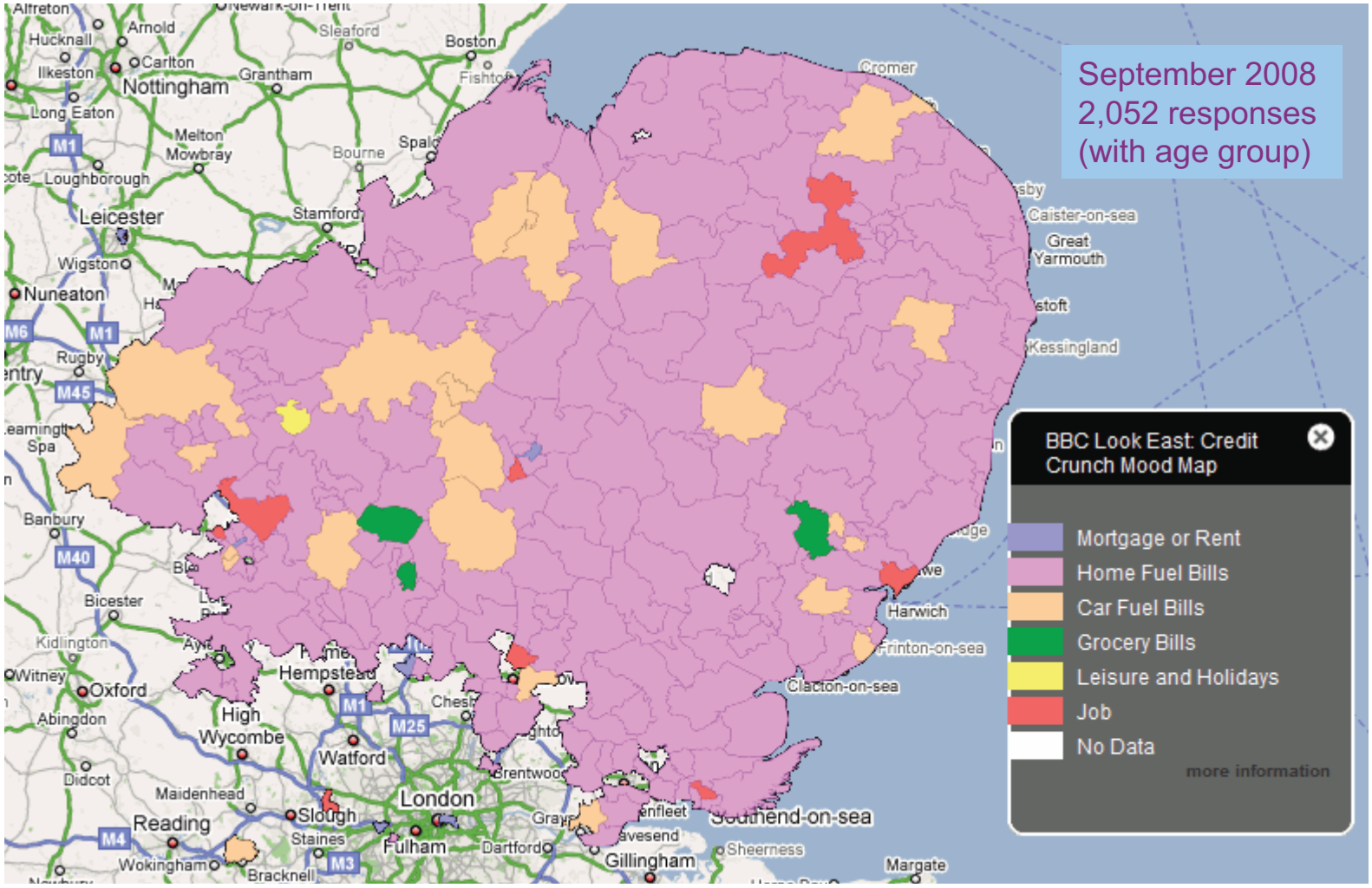
Manchester Congestion Charge



15,902 responses
October to December 2008

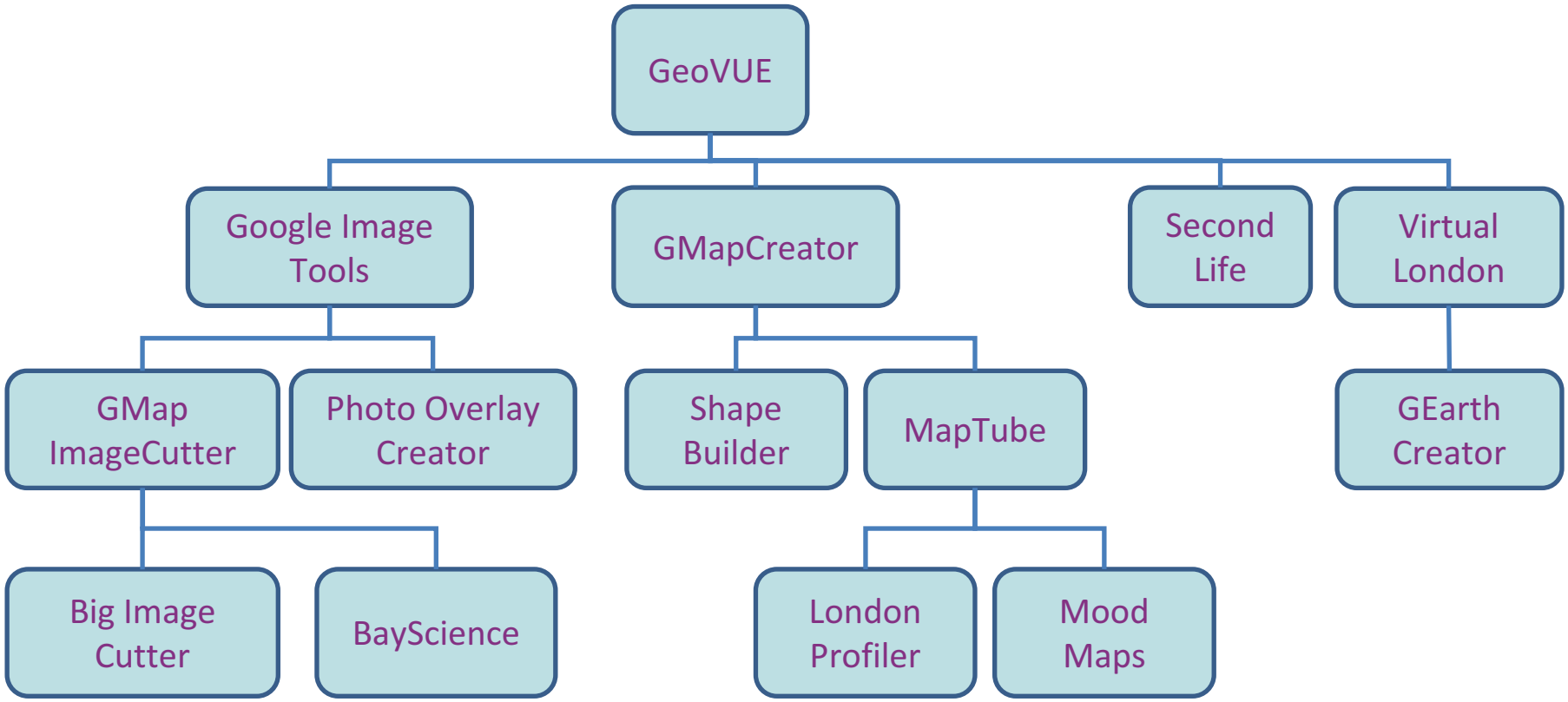


BBC Look East: Credit Crunch



http://www.maptube.org/LookEastCreditCrunch/

GeoVUE Family Tree




SurveyMapper - Welcome to SurveyMapper - Windows Internet Explorer
SurveyMapper
Home
Create Survey
Current Surveys
Search
About
Login
Welcome to SurveyMapper
Welcome to the beta release of SurveyMapper a free real-time geographic survey and polling tool from the nice people at the Centre for Advanced Spatial Analysis, University College London. If you have used other 'polling sites' then you will be up to speed, except we have taken away the restrictions and added real-time mapping into the mix.
Create your own Survey
How to use SurveyMapper
Latest Surveys
What is a thing to yo
Starts: 23/08/2010
0:00 / 0:55
twitter

Most Popular Live Surveys

CutsMap

There are a wide range of opinions about the "Cuts" that will be announced in the Comprehensive Spending Review. I want to discover whether there are any spatial or demographic patterns in the distribution of these opinions.
Started: 01/10/2010 Ends: 31/12/2010
89 views 47 responses

Safer Parks Survey

Making sure that our local parks are safe for everyone to use and enjoy is very important to us. Please take a few moments to tell us how you feel about your local park.
Started: 27/09/2010 Ends: 28/10/2010
58 views 17 responses

What is a thing to you?

Things are have been spotted in London and in North Carolina. Help us at Tissisippi define what a thing is.
Started: 23/09/2010 Ends: 31/12/2010
47 views 14 responses

Most Popular Surveys (All time)

How Happy Are You?

Are you happy or sad?
Started: 15/06/2010 Ends: 31/08/2010
562 views 264 responses

Public Perceptions of Crime - Beta Testing Survey

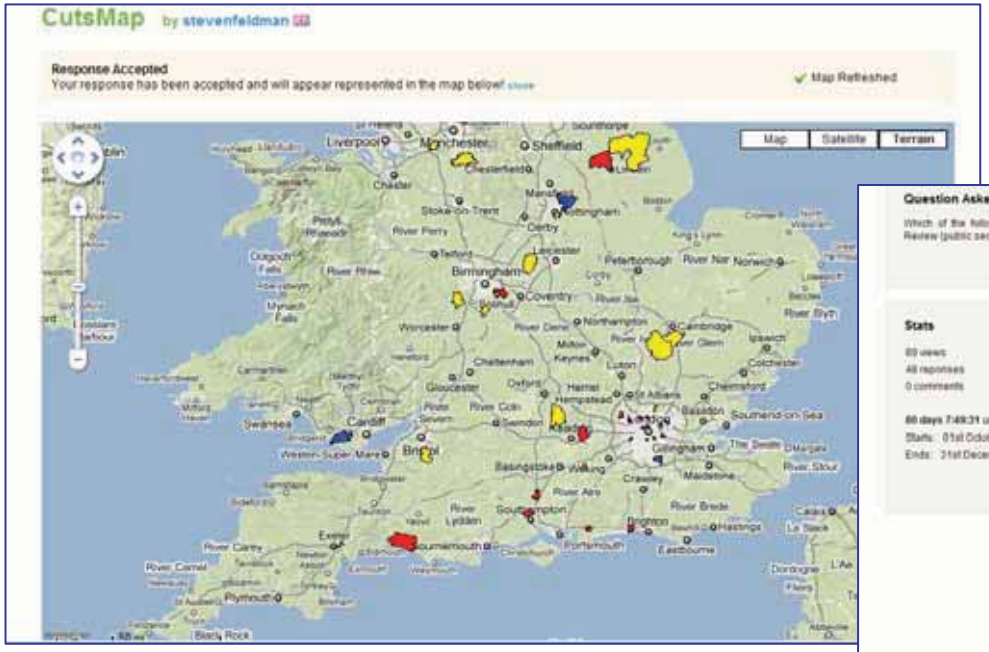
Survey to see perception of crime mapped to postcode
Started: 24/05/2010 Ends: 31/08/2010
533 views 3,106 responses

World Cup 2010

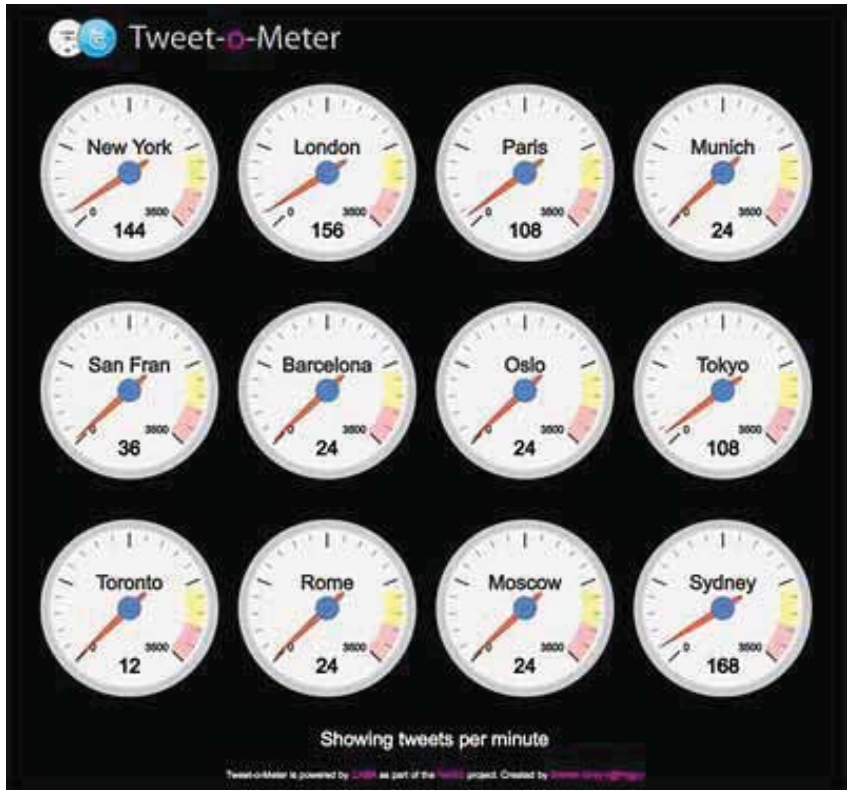
Who do you think is going to win the World Cup final?
Started: 08/07/2010 Ends: 11/07/2010
448 views 148 responses

Top Ten GeoCodes

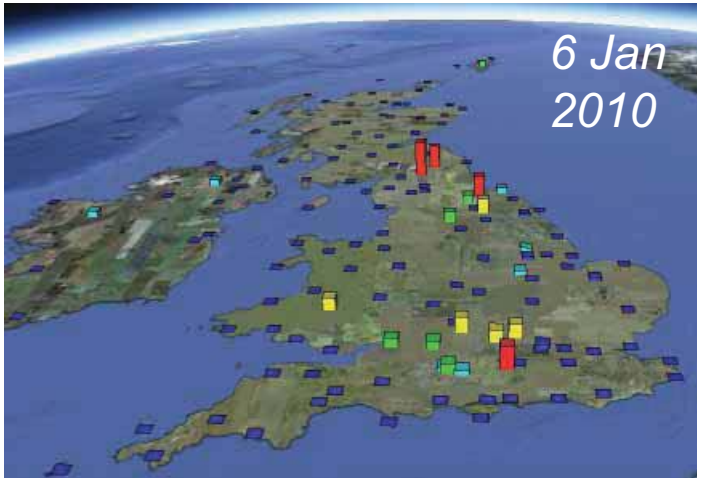
GeoCode	Responses	Percentage
TW11	3	6.25%
DY10	2	4.17%
DT6	1	2.08%
CV13	1	2.08%
CR6	1	2.08%
CF71	1	2.08%
CB22	1	2.08%
BT5	1	2.08%
BS39	1	2.08%
BN15	1	2.08%



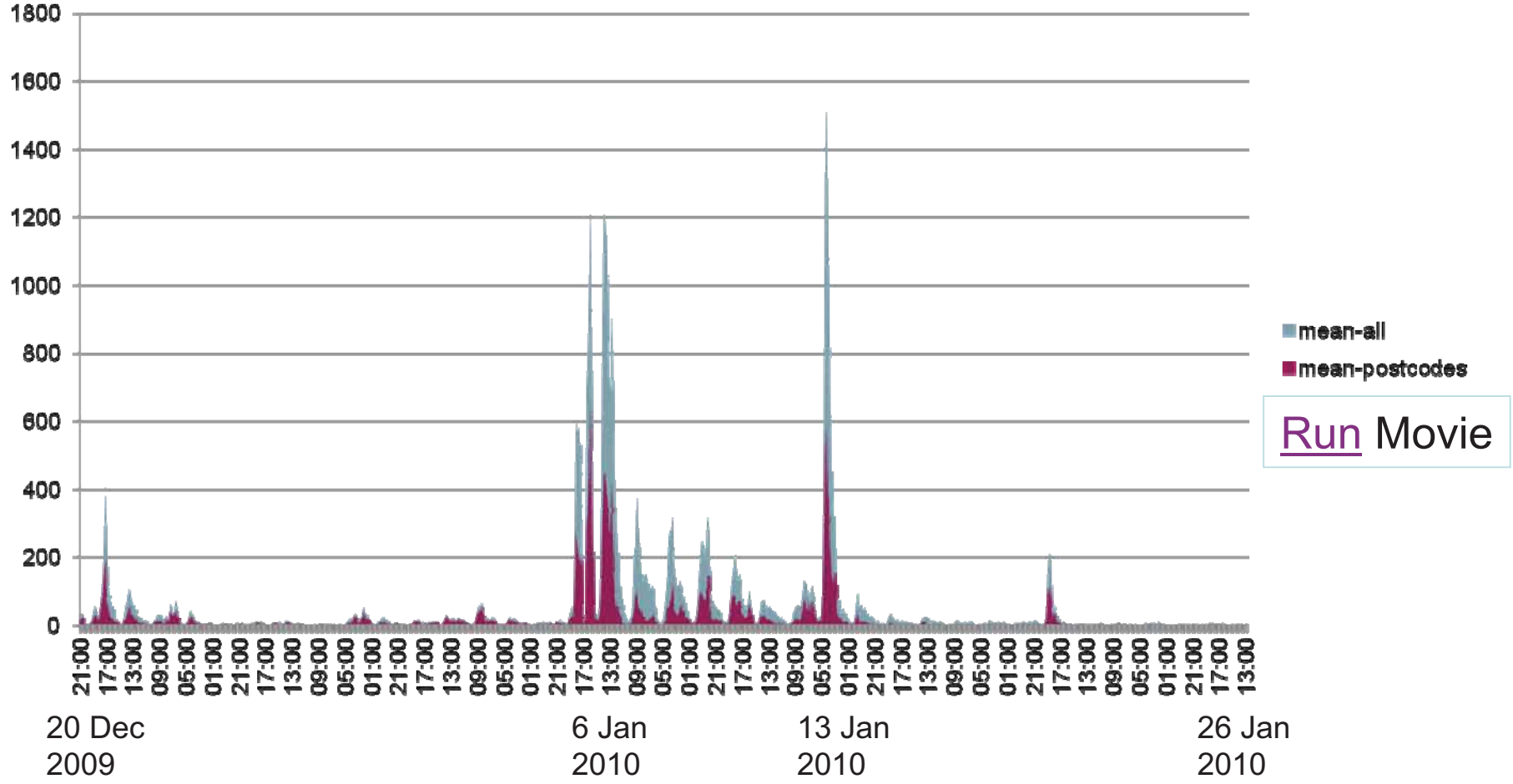
Seriously Capturing and Scraping Data: Twitter and online streaming, London Bikes



10953	*Dratted cold snap has killed the car battery..Â£70 for a new one...#uksnow*	*21/12/2009 22:53*	*pablothehat (pablothehat)*
5788	*Steady heavy snow in Chesham HP5 #uksnow*	*21/12/2009 15:57*	*iotaMEDIA (Gordon O'Neill)*
5789	*#uksnow SG10 3/10*	*21/12/2009 15:57*	*domsparkes (domsparkes)*



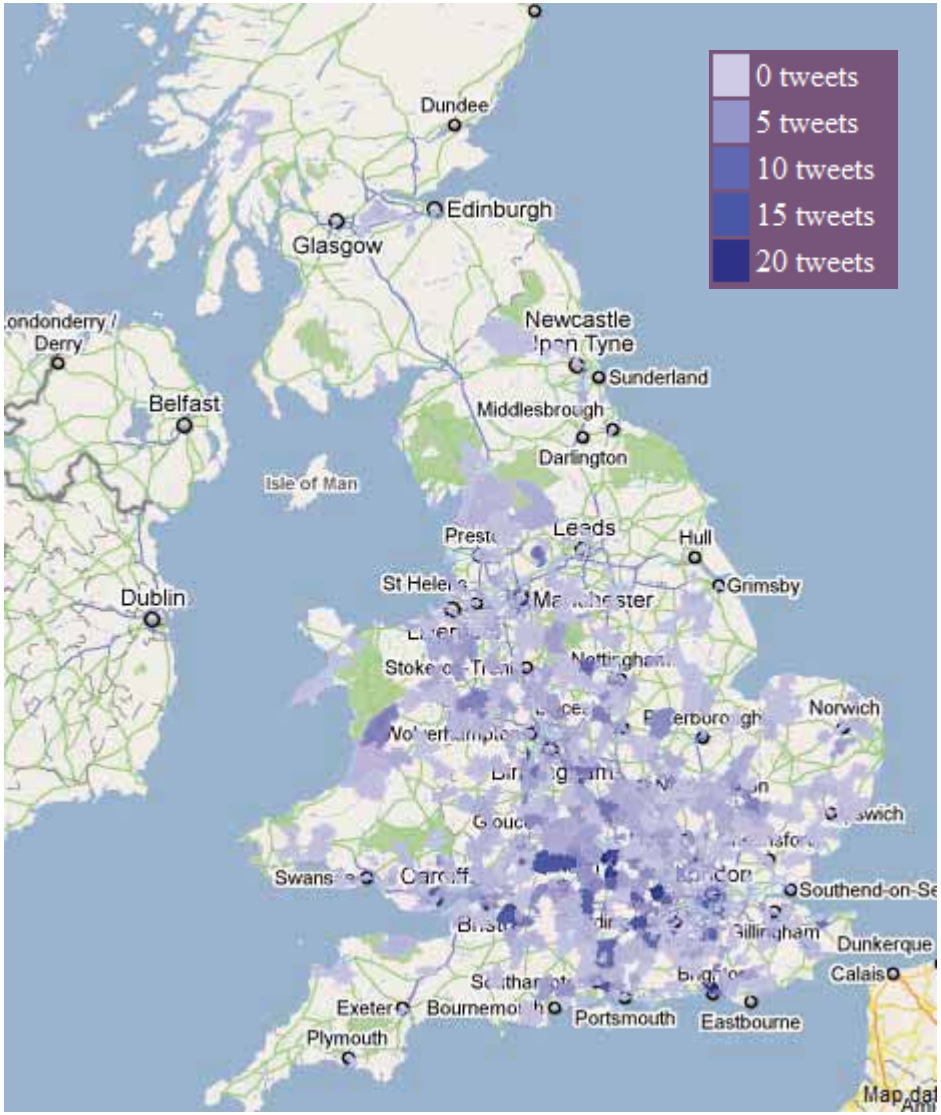
Tweets Per Hour (#uksnow)



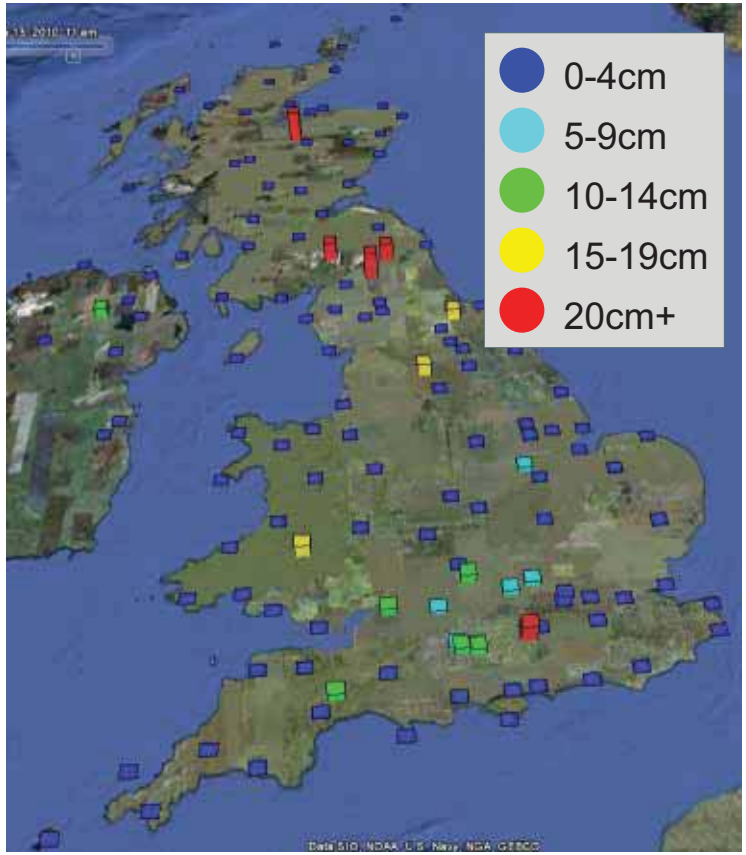
Run Movie

Tweets using the #uksnow tag shown as tweets (grey) and those containing a valid postcode (red)

#uksnow tweets: Wed 13 January 2010



Tweets using the #uksnow tag for Wednesday 13th January 2010 plotted as a count by postcode for the whole day, compared to UKMO data for 12Z



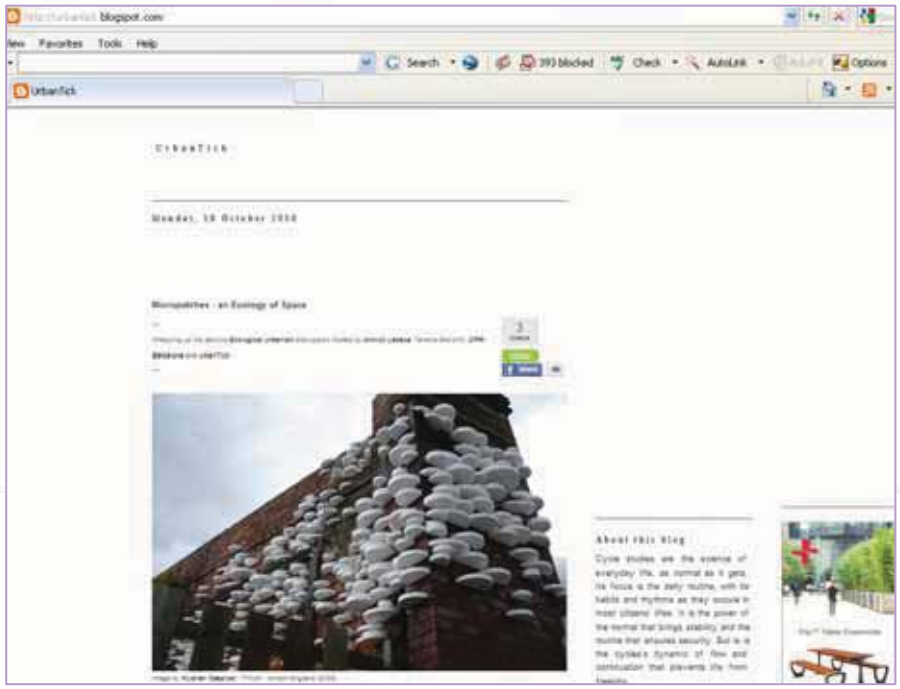

Unregistered HyperCam 2
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image IBCAO
Image © 2010 TerraMetrics
Image © 2010 IGN France
©2009 Google

Tweets as Background Radiation about Dynamics in the City

Urban Tick

Urban Tick is a new blog which is written by Fabian Neuhaus who is studying rhythms and cycles in the city for his doctoral work. An important way of looking at cities is through the fast processes that define the functions of the urban environment of which local movement is key. Tracking individuals and relating their space time trajectories to their behaviours and the activities that they frequent and use is basic to the way cities are organised. We can begin to define spatial structures in terms of such movement and tracking individuals is fast becoming one of the ways in which such structures can be defined. Contemporary IT with embedded GPS is central to all of this and Urban Tick seeks to record what is moving and shaking this fast developing field .

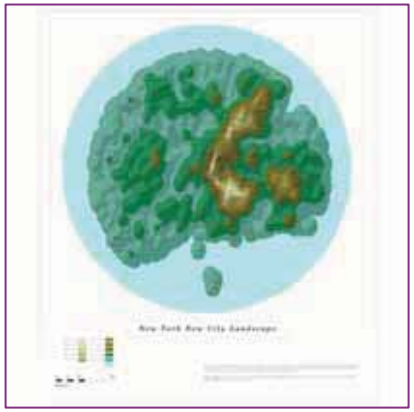
http://urbantick.blogspot.com



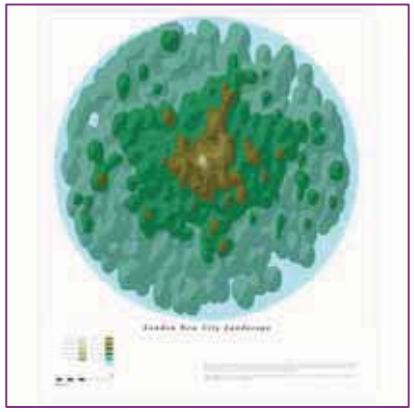
About this blog

Cycle studies are the science of everyday life, as normal as it gets. Its focus is the daily routine, with its habits and rhythms as they occure in most citizens' lifes. It is the power of the normal that brings stability and the routine that ensures security. But is is the cycles's dynamic of flow and continuation that prevents life from freezing.
Cycles therefore stand for stability but are at the same time the engine of change.

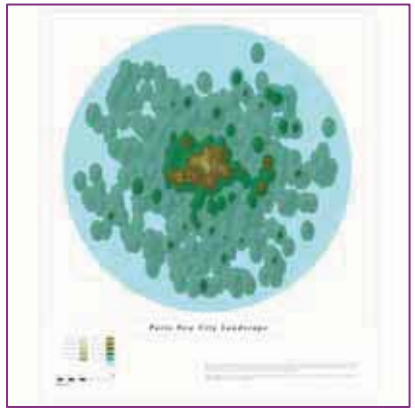
With this blog the research on cycles and rhythms will be embedded in the most recent developments in technology, covering a range of areas with a focus on space-time related technologies.



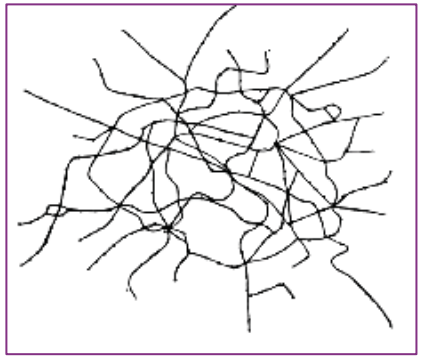
New York

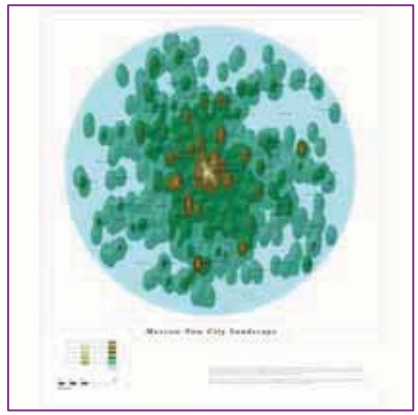


London

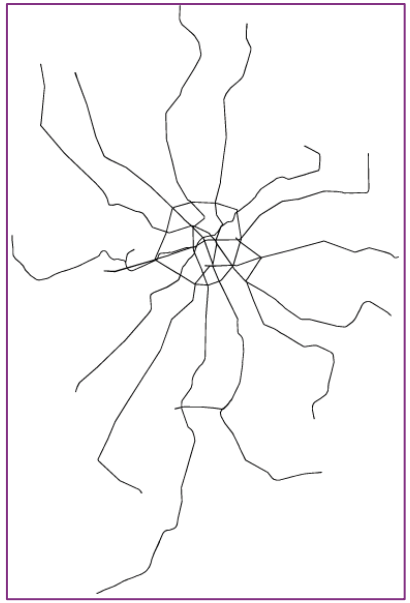


Paris

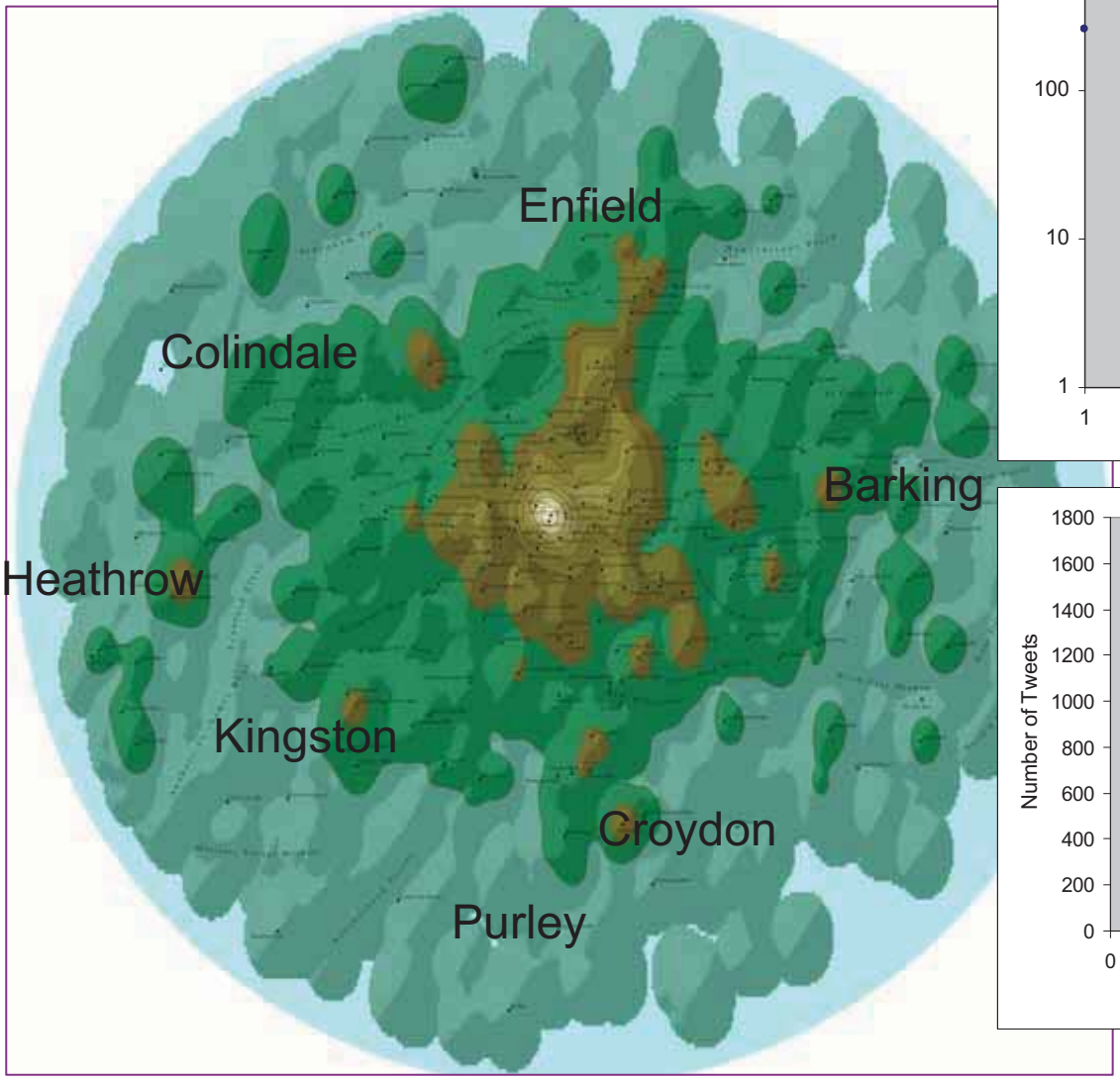


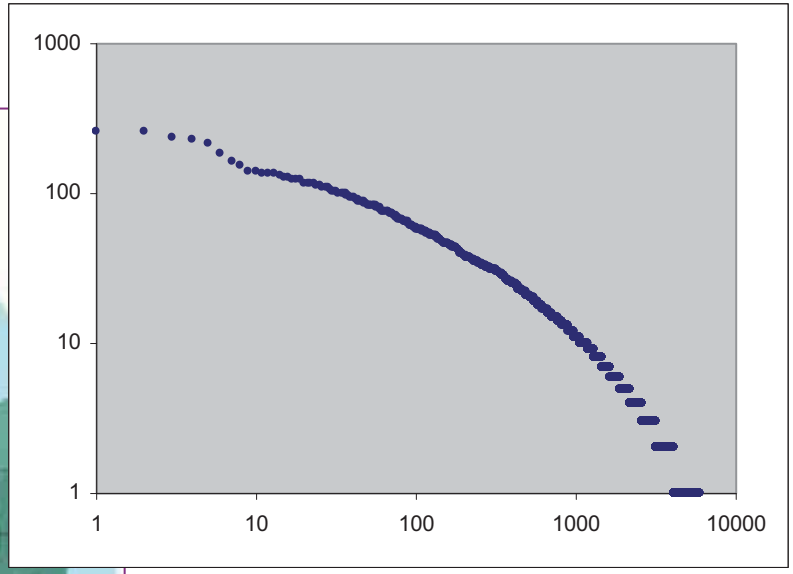


Moscow



London


Enfield
Colindale
Barking
Heathrow
Kingston
Croydon
Purley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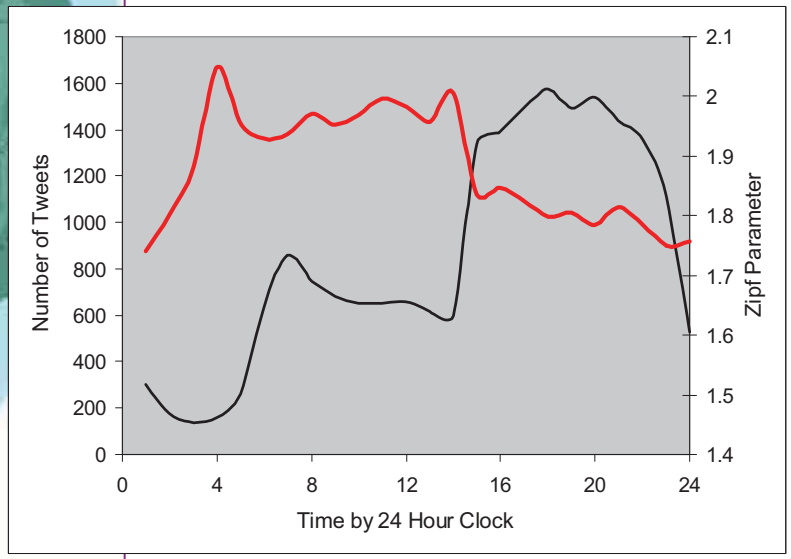
10
1
1
10
100
1000
10000


1800
1600
1400
1200
1000
800
600
400
200
0
Number of Tweets
2.1
2
1.9
1.8
1.7
1.6
1.5
1.4
Zipf Parameter
0
4
8
12
16
20
24
Time by 24 Hour Clock

Scraping Data: The London Bikes Experiment

Locally called Boris's Bikes

Essentially a scheme to introduce public bike transport to central London to take people out of cars and trains and even buses and to promote sustainability, as well as counter obesity

4200 bikes, 340 stations, access via online registration or by paying on a credit card at the local bike station – so all online data

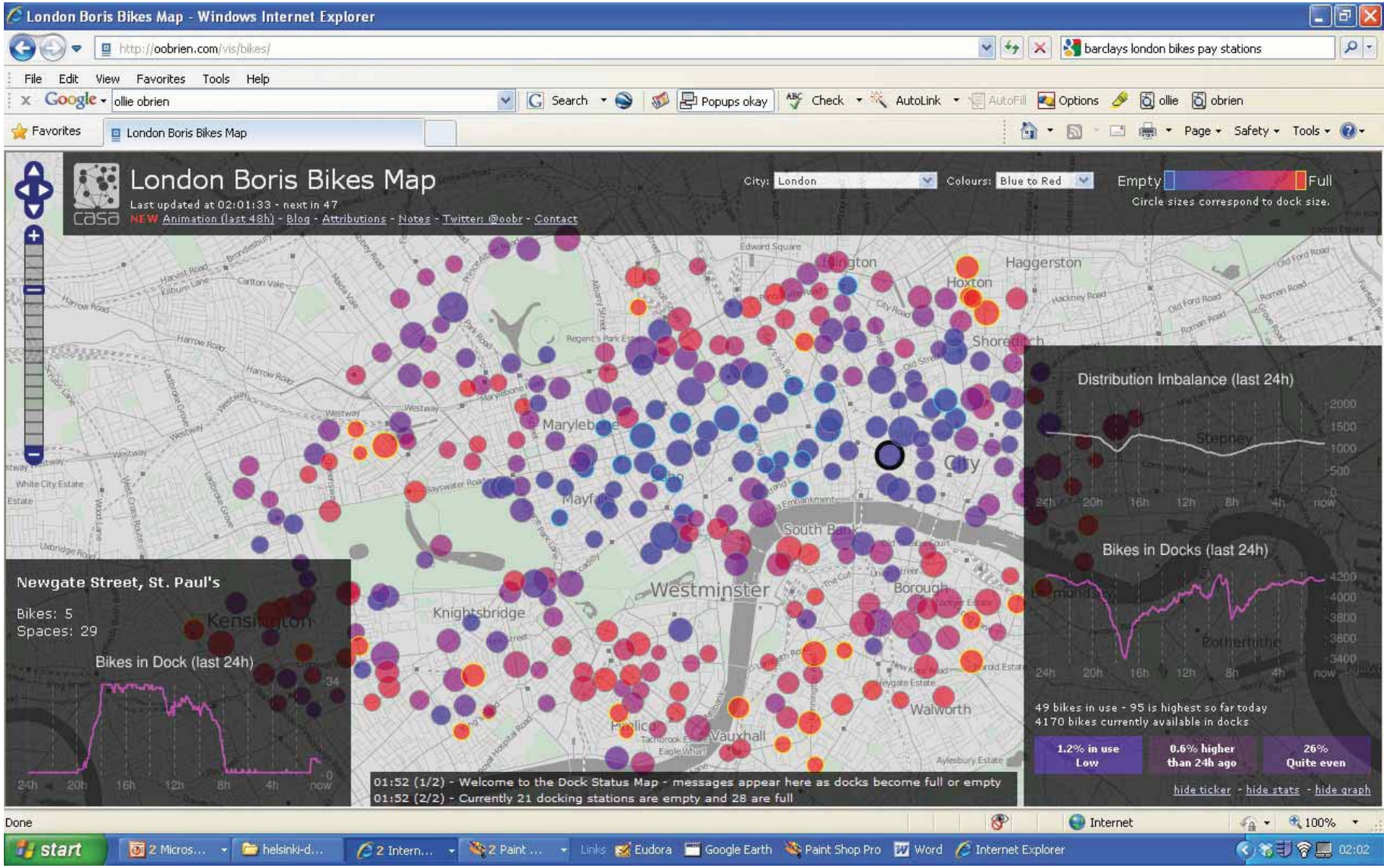
Ollie O'Brien in CASA has built an online resource to scrape the data continually – every few minutes of demand and supply of bikes – how full the bike stations are. From this you can assess where there is space and where there is congestion

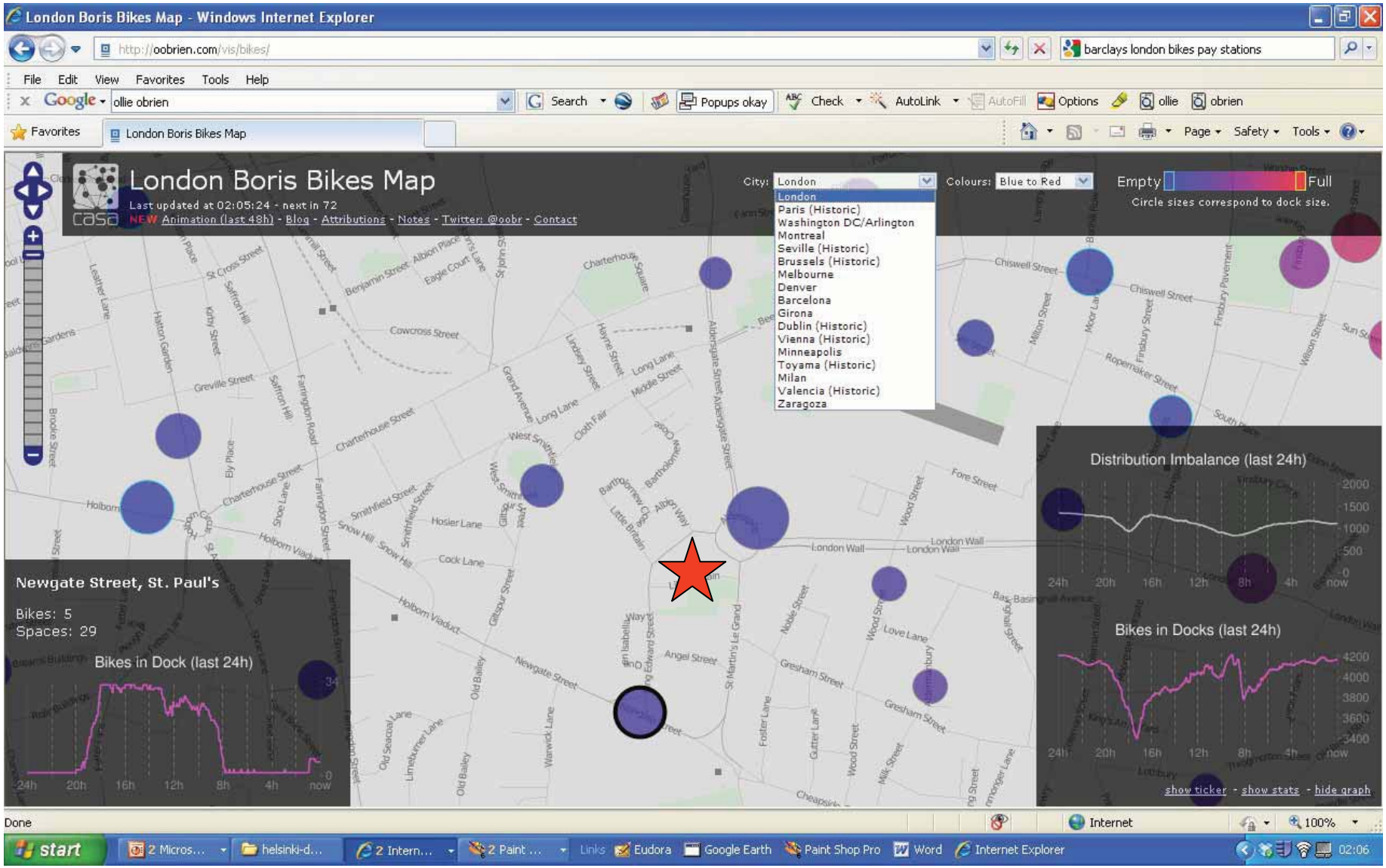
And he does this all the time, so if you log onto his web site – his blog in fact

http://oobrien.com/vis/bikes/

Then you will get all this data – let me show you some pictures of it – I may even log on and show it now live but it is slow in Explorer on this machine

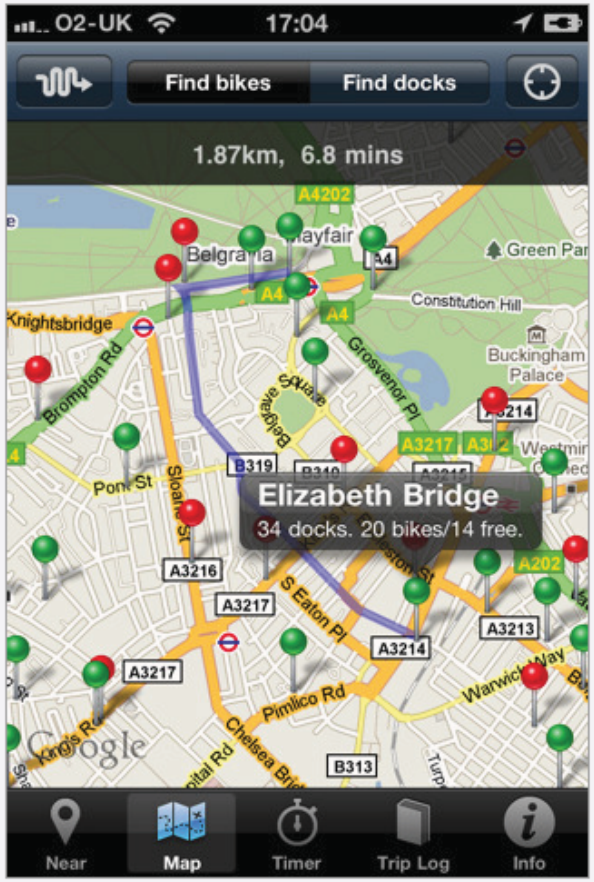
This is a great example of a real time demand supply management system which is powered by maps - OSM

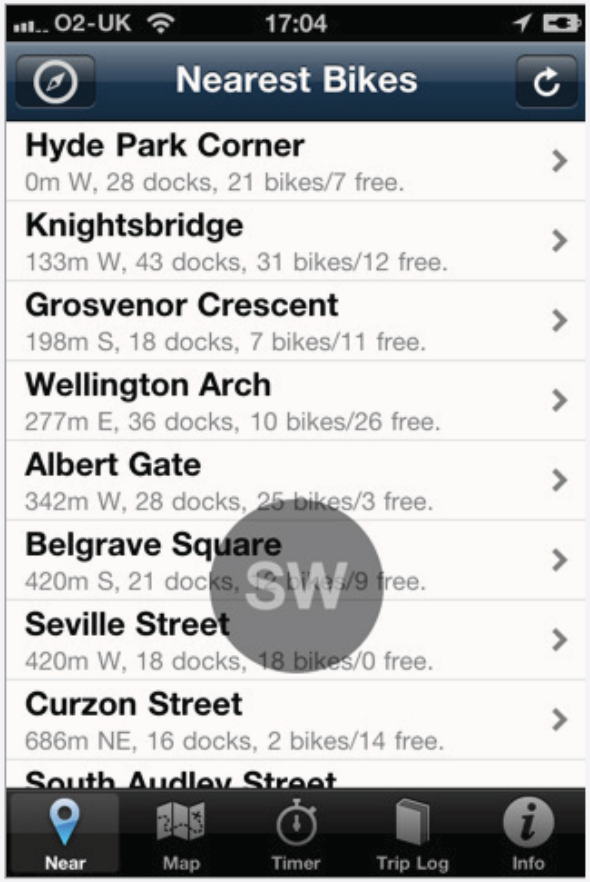

London Boris Bikes Map - Windows Internet Explorer
http://oobrien.com/vis/bikes/
barclays london bikes pay stations
File Edit View Favorites Tools Help
ollie obrien
Favorites
London Boris Bikes Map
Page Safety Tools
London Boris Bikes Map
Last updated at 02:01:33 - next in 47
NEW Animation (last 48h) - Blog - Attributions - Notes - Twitter: @oobr - Contact
City: London
Colours: Blue to Red
Empty Full
Circle sizes correspond to dock size.
Distribution Imbalance (last 24h)
Bikes in Docks (last 24h)
Newgate Street, St. Paul's
Bikes: 5
Spaces: 29
Bikes in Dock (last 24h)
49 bikes in use - 95 is highest so far today
4170 bikes currently available in docks
1.2% in use
Low
0.6% higher than 24h ago
26%
Quite even
hide ticker - hide stats - hide graph
01:52 (1/2) - Welcome to the Dock Status Map - messages appear here as docks become full or empty
01:52 (2/2) - Currently 21 docking stations are empty and 28 are full
Done
Internet
100%
start
Eudora
Google Earth
Paint Shop Pro
Word
Internet Explorer
02:02



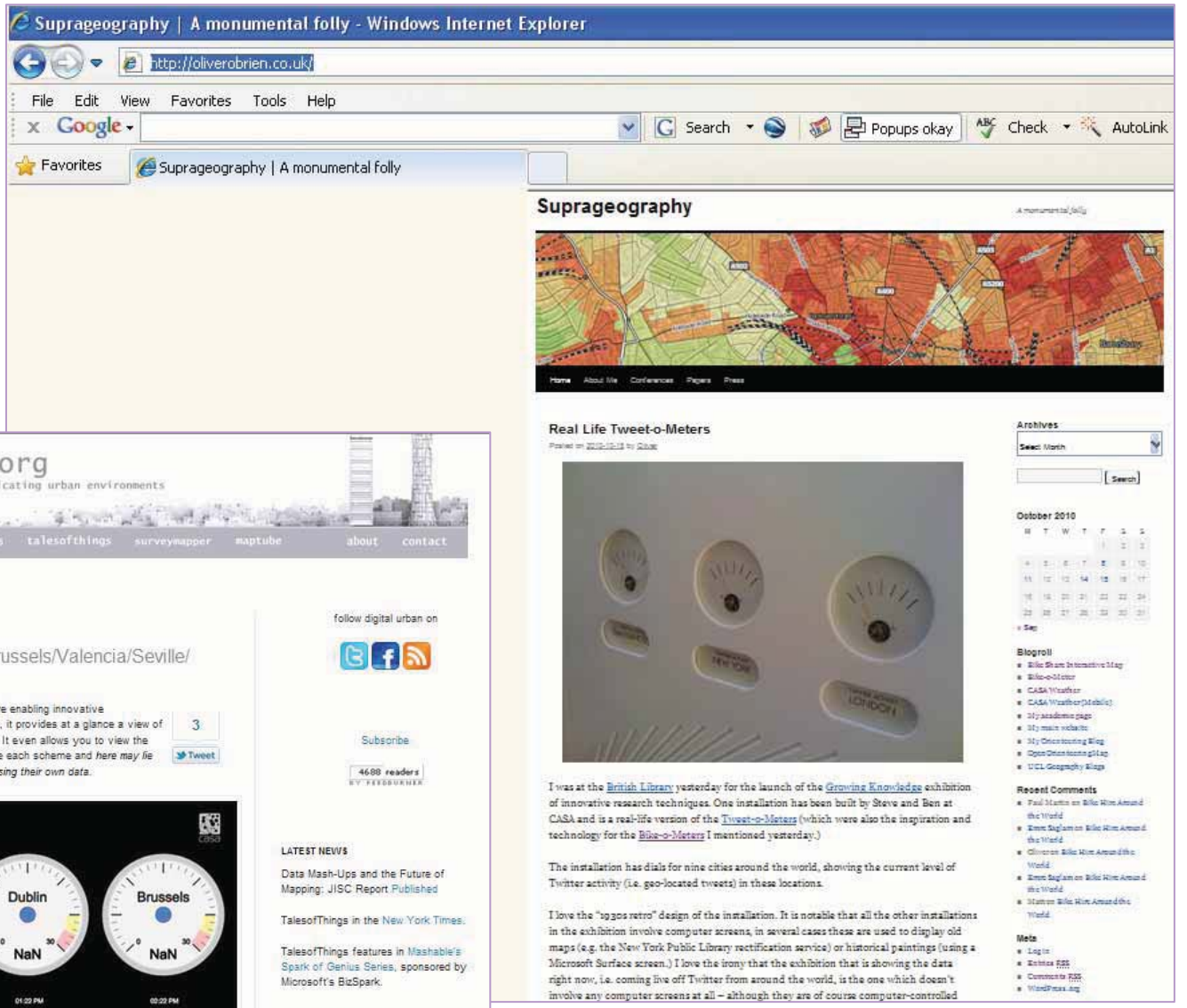
As yet no records of demand from people logging on, so no management capabilities, but could happen probably from an App based software but maybe from the server

iPhone Screenshots






flickr
Steve


Suprageography | A monumental folly - Windows Internet Explorer
http://oliverobrien.co.uk/
File Edit View Favorites Tools Help
Search
Popups okay
Check
AutoLink
Favorites
Suprageography | A monumental folly
Suprageography
Real Life Tweet-o-Meters
I was at the British Library yesterday for the launch of the Growing Knowledge exhibition of innovative research techniques. One installation has been built by Steve and Ben at CASA and is a real-life version of the Tweet-o-Meters (which were also the inspiration and technology for the Bike-o-Meters I mentioned yesterday.)
The installation has dials for nine cities around the world, showing the current level of Twitter activity (i.e. geo-located tweets) in these locations.
I love the "1930s retro" design of the installation. It is notable that all the other installations in the exhibition involve computer screens, in several cases these are used to display old maps (e.g. the New York Public Library rectification service) or historical paintings (using a Microsoft Surface screen.) I love the irony that the exhibition that is showing the data right now, i.e. coming live off Twitter from around the world, is the one which doesn't involve any computer screens at all – although they are of course computer-controlled
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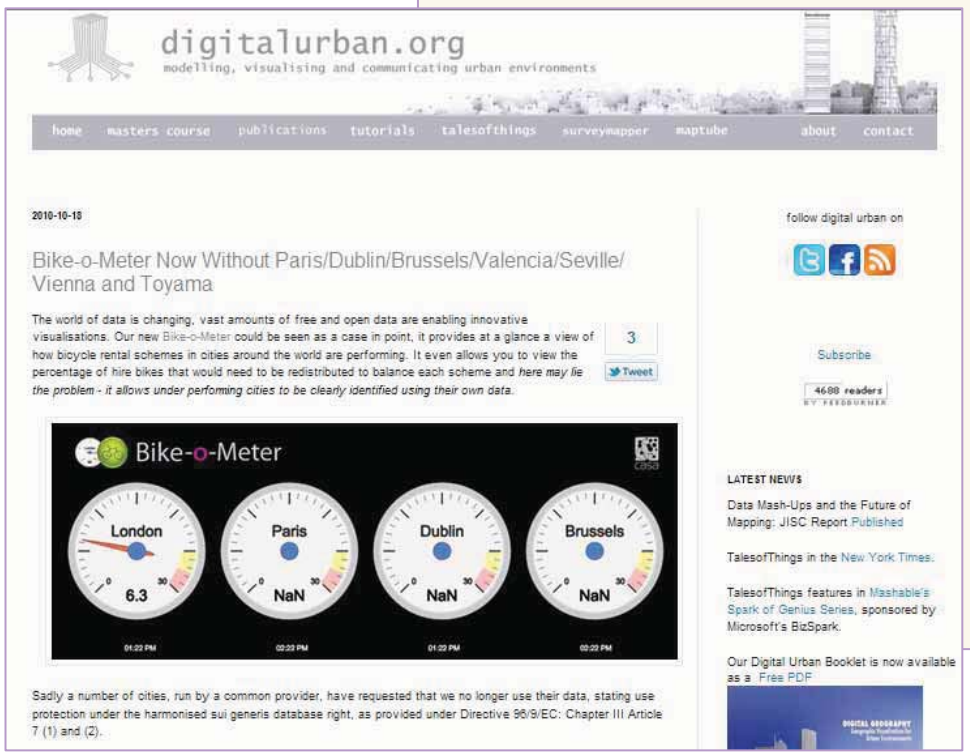
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2010-10-18
Bike-o-Meter Now Without Paris/Dublin/Brussels/Valencia/Seville/ Vienna and Toyama
The world of data is changing, vast amounts of free and open data are enabling innovative visualisations. Our new Bike-o-Meter could be seen as a case in point, it provides at a glance a view of how bicycle rental schemes in cities around the world are performing. It even allows you to view the percentage of hire bikes that would need to be redistributed to balance each scheme and here may lie the problem - it allows under performing cities to be clearly identified using their own data.
3
Tweet
Bike-o-Meter
London
Paris
Dublin
Brussels
6.3
NaN
NaN
NaN
Sadly a number of cities, run by a common provider, have requested that we no longer use their data, stating use protection under the harmonised sui generis database right, as provided under Directive 96/9/EC: Chapter III Article 7 (1) and (2).
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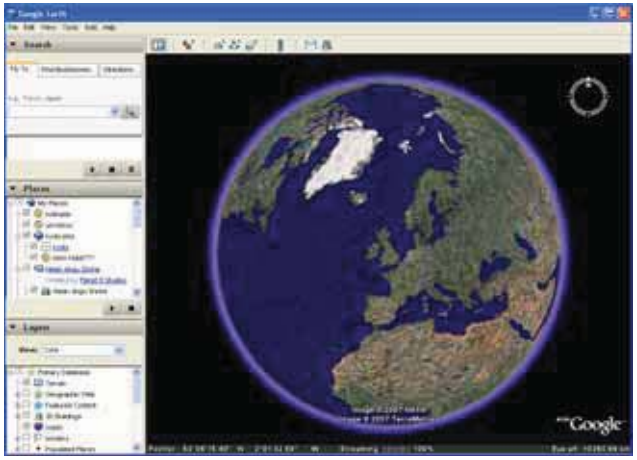
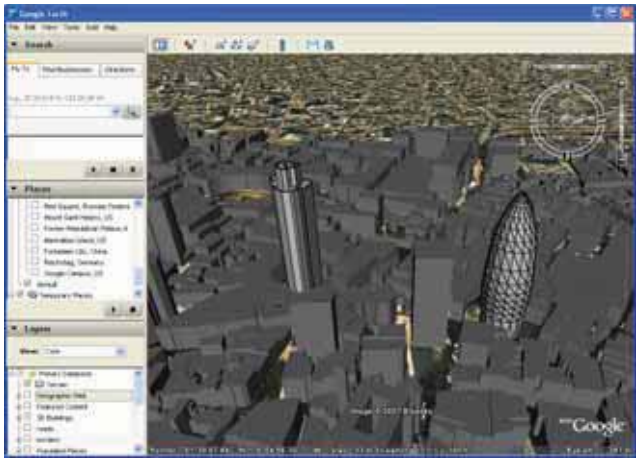
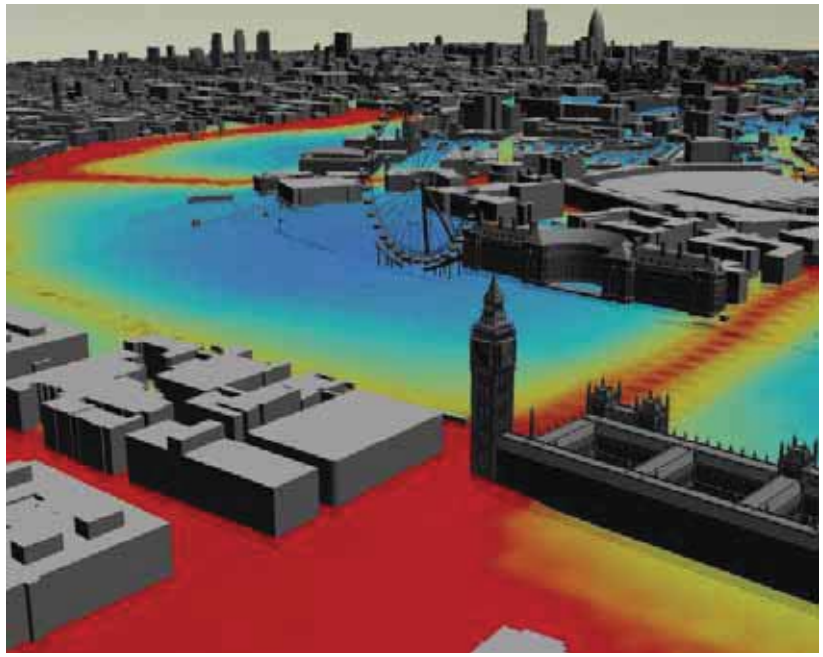
2D to 3D: GIS to CAD and back and on the web

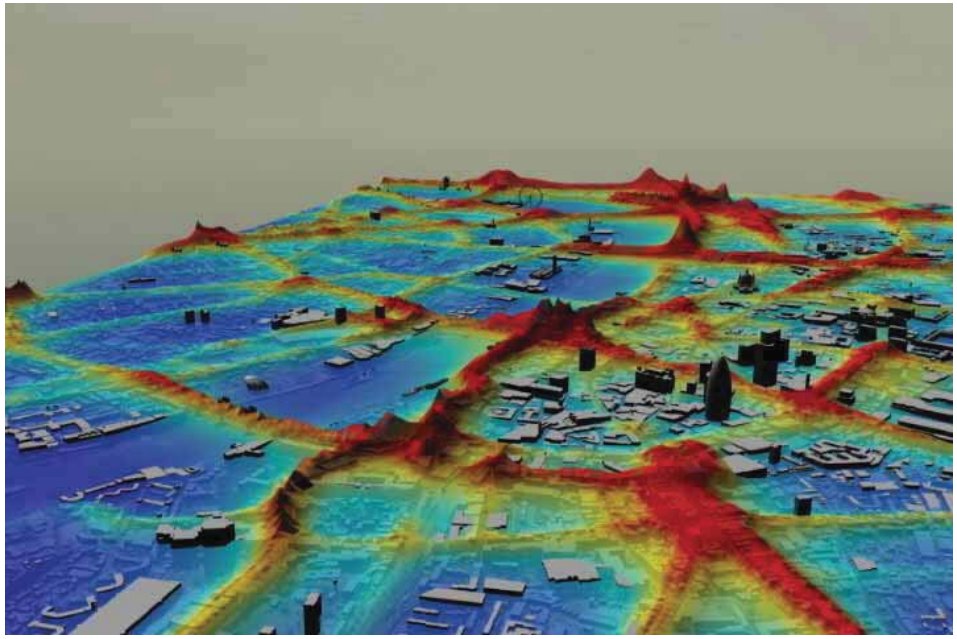




We are attempting to integrate much of this data with more conventional spatial information

And to construct and make this available in various kinds of multimedia from 3-D GIS to CAD to movies to virtual exhibition spaces based on virtual worlds



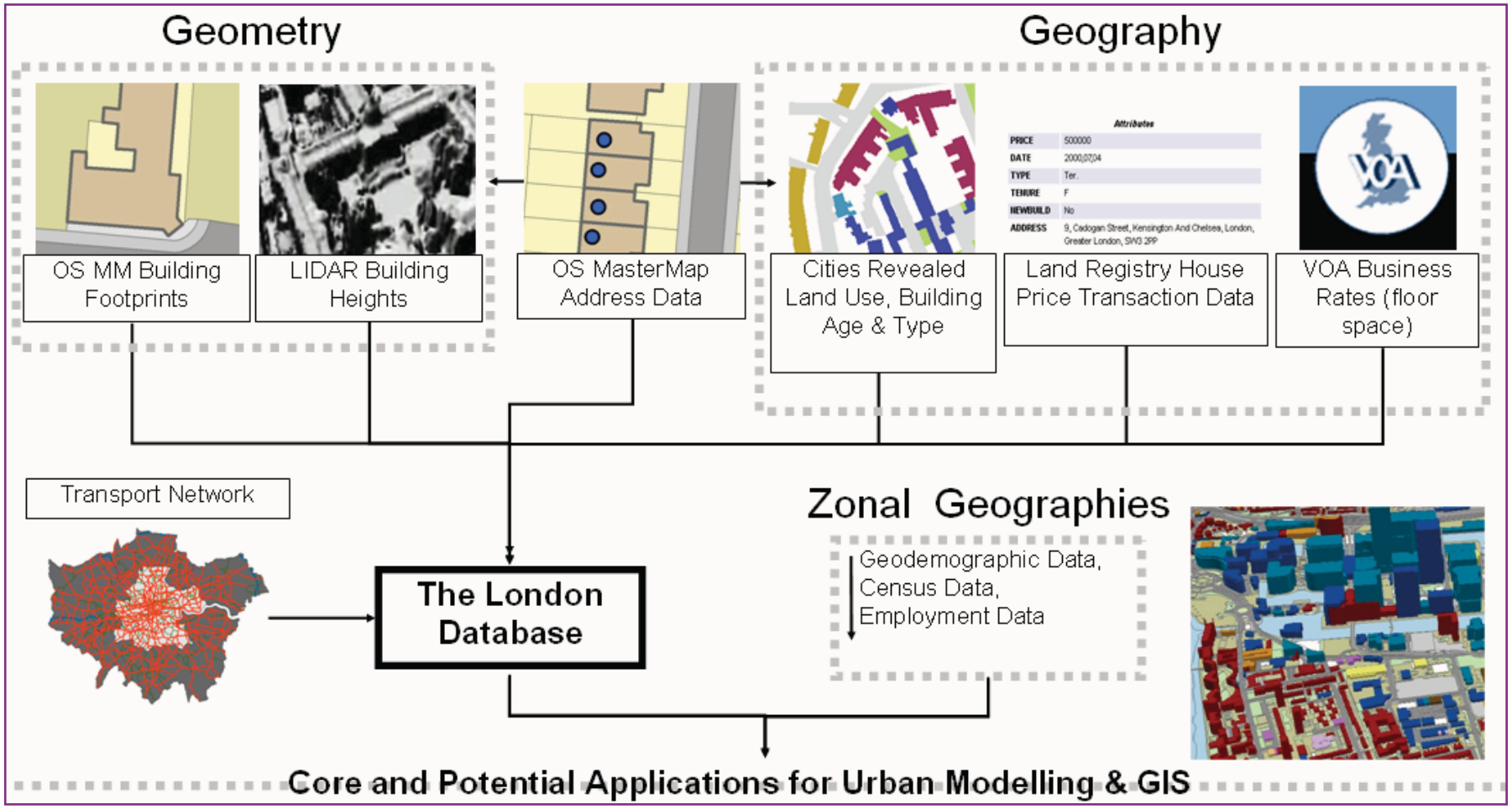


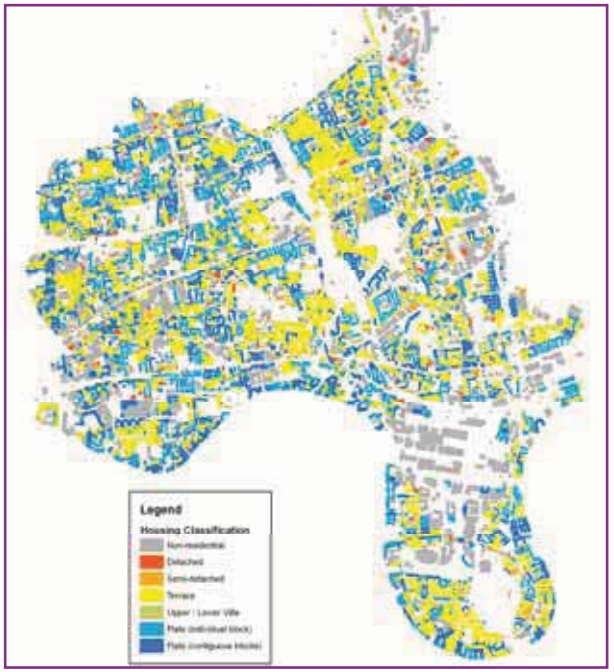
The key issue for us is to populate this data base of 3.6 million building blocks with socio-economic data

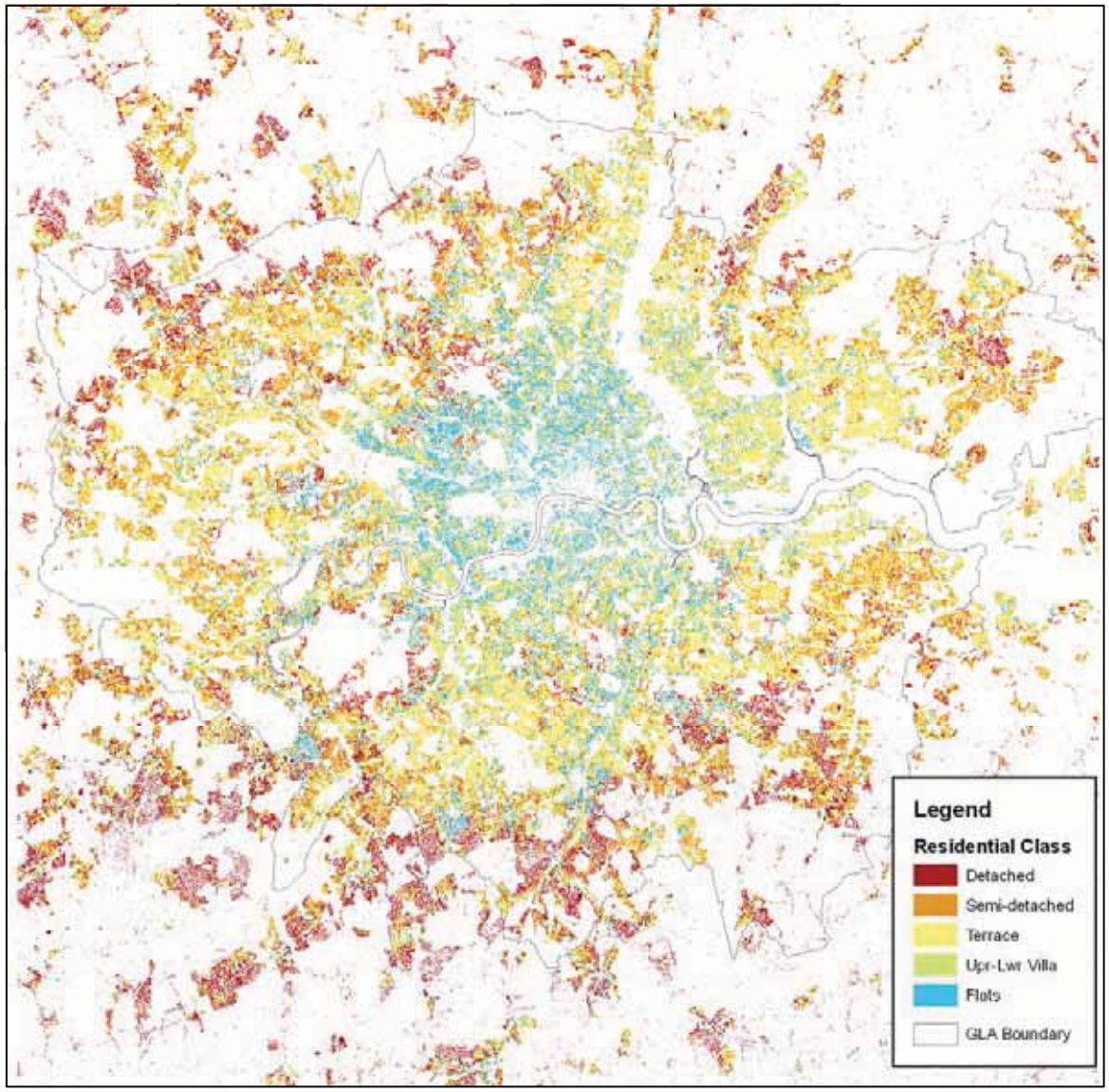
This is linking geometry to geography in a way that will explode the data base to levels much more reminiscent of large scale databases in the physical sciences than the rather modest social data bases based on aggregates of population

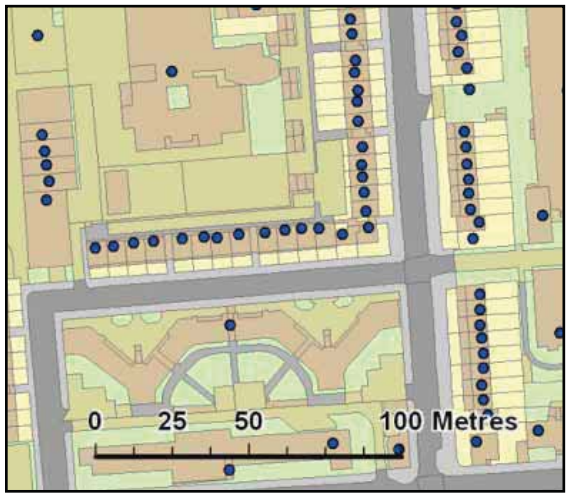
Linking these to individual address point data is another related issue too as well as tagging buildings to populations

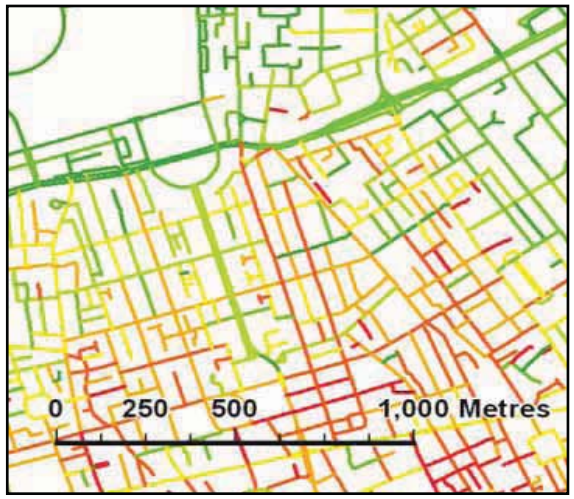
From geometry to geography and back – populating really large spatial data bases

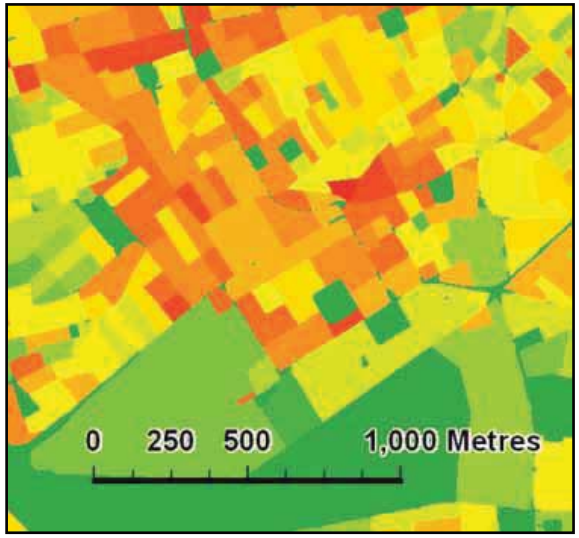


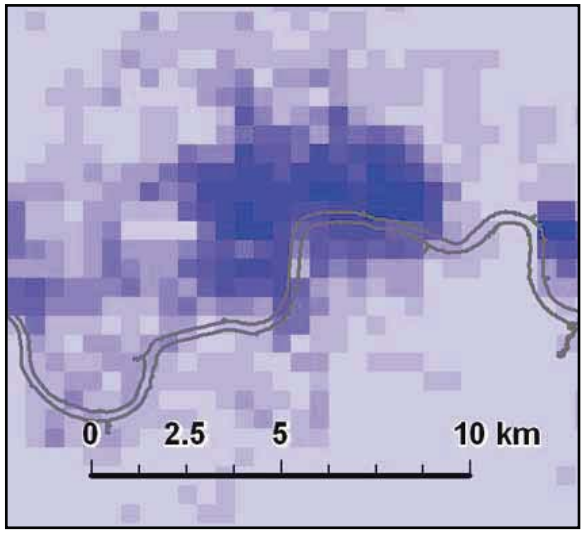

Legend
Housing Classification


Legend
Residential Class
Detached
Semi-detached
Terrace
Upr-Lwr Villa
Flats
GLA Boundary

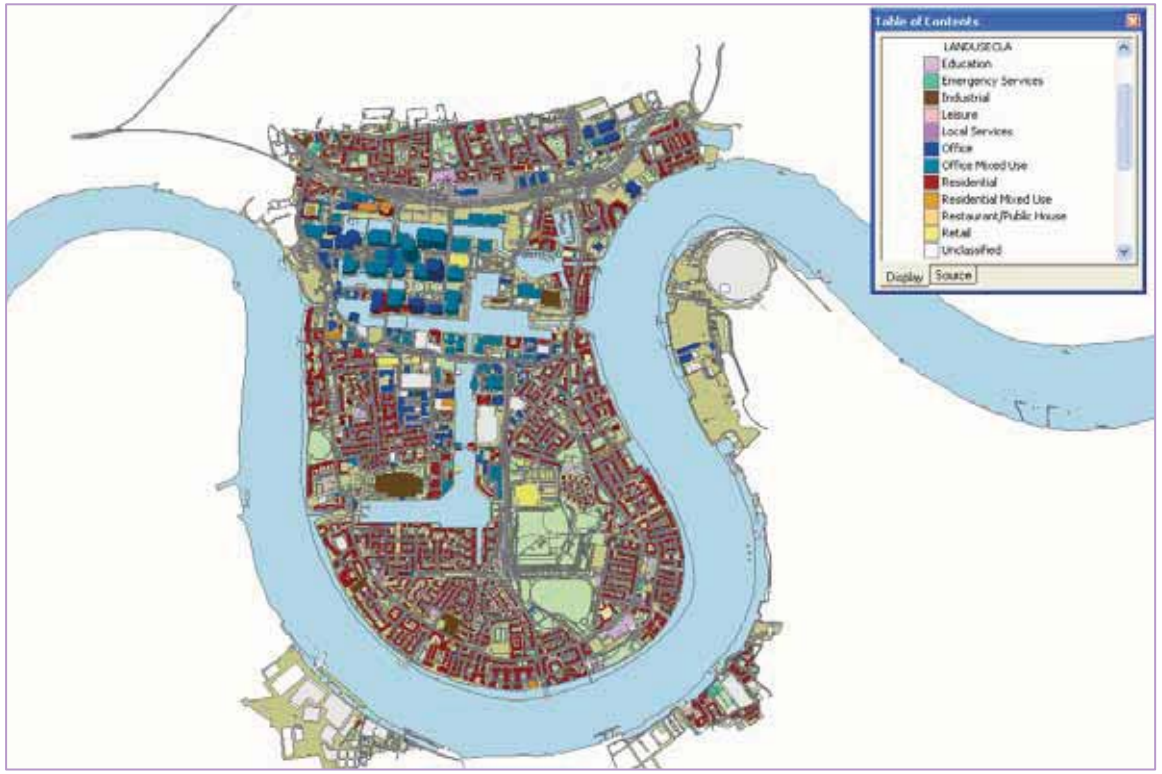








Adding Land Use, Transport and Populations and Aggregating Scales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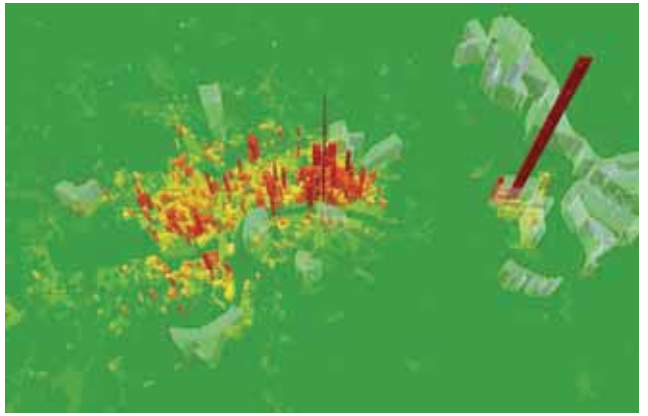
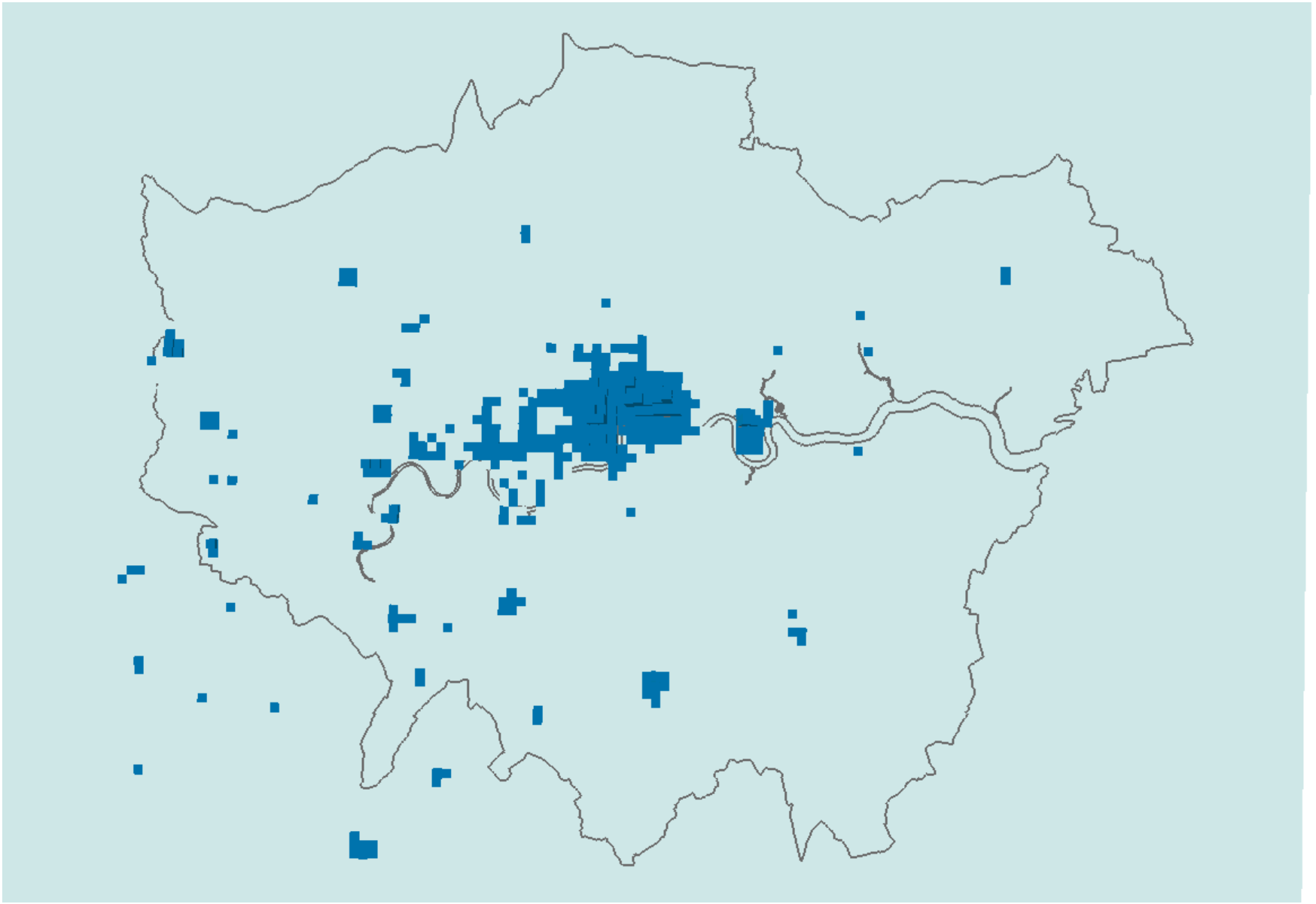
Source





Part of this future is disseminating spatial data in multimedia – games and virtual worlds

Thanks, Any Questions?

Look at our web sites

http://www.casa.ucl.ac.uk/

http://www.surveymapper.com/

http://www.maptube.org/

http://www.oobrien.com/

Our Blogs

http://www.digitalurban.blogspot.com/

http://gisagents.blogspot.com/

http://www.genesis.ncess.ac.uk/

Credits

Andy Hudson-Smith, Ollie O'Brien, Richard Milton, Steven Gray, Duncan Smith, Fabian Neuhaus