



Technologies for Simulating Cities

Modelling, Tracking, Visualising Futures for Cities

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Three Very Different Views of the City

Simulating Futures

Tracking the Present

Tagging the Material City

& **Mapping** *but I won't have time to talk about our crowdsourcing and mapping work*



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- ***Simulating Futures*** Land Use Transportation in Large Cities
- Key Challenges: Climate Change, Energy Issues, Aging
- *Symbolic Models*: Land Use Transportation Interactions: LUTI Models for Greater London
- *Iconic Models*: Visualising City Form
- Participation: Stakeholder Interaction
- Some Examples for London



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- Desktop Running of Symbolic LUTI Models
- Visualisation of Every Stage of the Modelling Process – in terms of Data and Predictions and in terms of the Actual Operation of the Models
- Models linked to the Web under Various Kinds of User Control
- Linking Diverse Software packages together from the Desktop to the Cloud
- Running Models with Stakeholder Interaction



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London and the Thames Gateway Land Use Transportation Model

Cities Research Programme
Tyndall Centre
 for Climate Change Research

CASA UCL Newcastle CE9

This program is a rudimentary land-use transportation model built along classical lines which allocates population and employment to small zones of the urban system. It uses spatial interaction principles which bind the population sector (residential or housing) to employment sector (work or industrial and commercial) through the journey to work (work trips) and the demand from services (which loosely translate into trips made to the retail and commercial sector).

The model is being built for Greater London and the Thames Gateway at ward level - 633 in all - so that it can be used in a wider process of integrated assessment focussed on assessing the impact of climate change on small areas in this metropolitan region. In particular rises in sea level and pollution are key issues, and as such the model sits between aggregate assessments of environmental changes associated with global and regional climate change models and environmental input output models, and much more disaggregate models related to the detailed hydrological implication of long term climate change.

The programme enables the user to read in the data and explore it spatially, to calibrate the parameters of the model and explore its outputs spatially and to engage in various predictions ranging from the typical 'business as usual scenarios' to much more radical changes posed limits on spatial behaviour which either result from climate change and, or mandated by government. The predictions and scenarios are intended to go out to 2100 and thus the model is largely designed as a sketch planning tool.

These various stages of the model contained in a master tool bar which is activated when the GO! button is pressed on this screen. The master tool bar enables the users to proceed through the various stages indicated and to display outputs in map and statistical form at any stage.

with **GLA ECONOMICS LONDON** **GO!**

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Reading in Data

Population, Employment and Floor-space Data

Read Employment Data

Read Population Data

Read Floor-space Data

Physical Line and Area Data

Travel Data

Modes

- Road
- Bus
- Heavy Rail
- Light Rail
- All Trips

Zones: 633 Wards in 2001

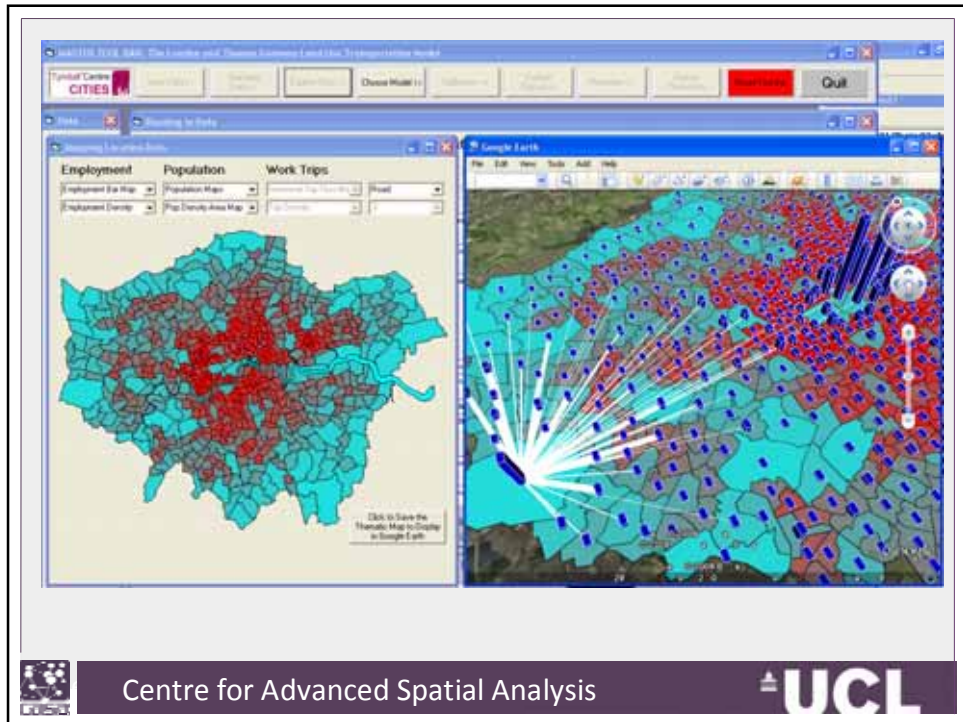
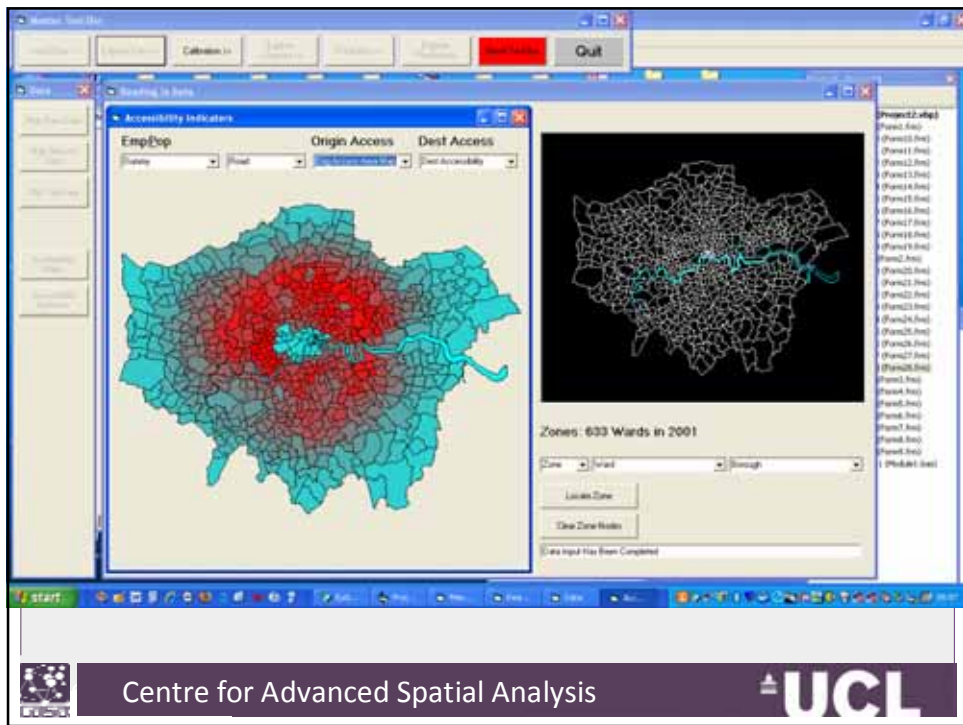
Click Here If You Wish to Change This Interface

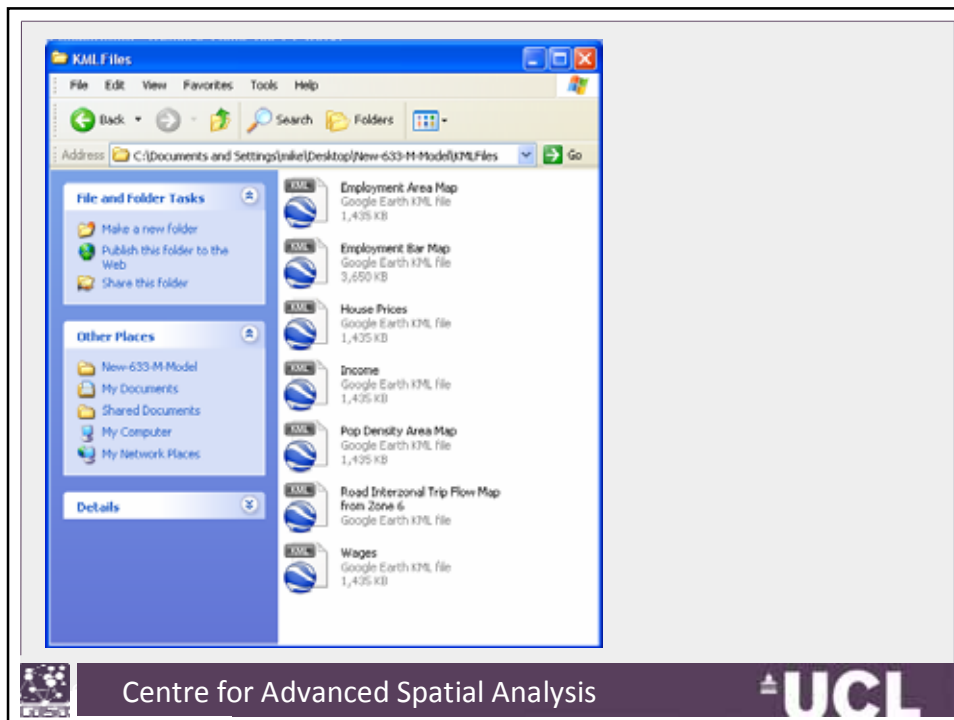
Load Zone

Data Input Has Been Completed

Road: 38%; Bus: 12%; Heavy Rail: 12%; Light Rail 19%; Other (Walk, Bike, Fly): 19%

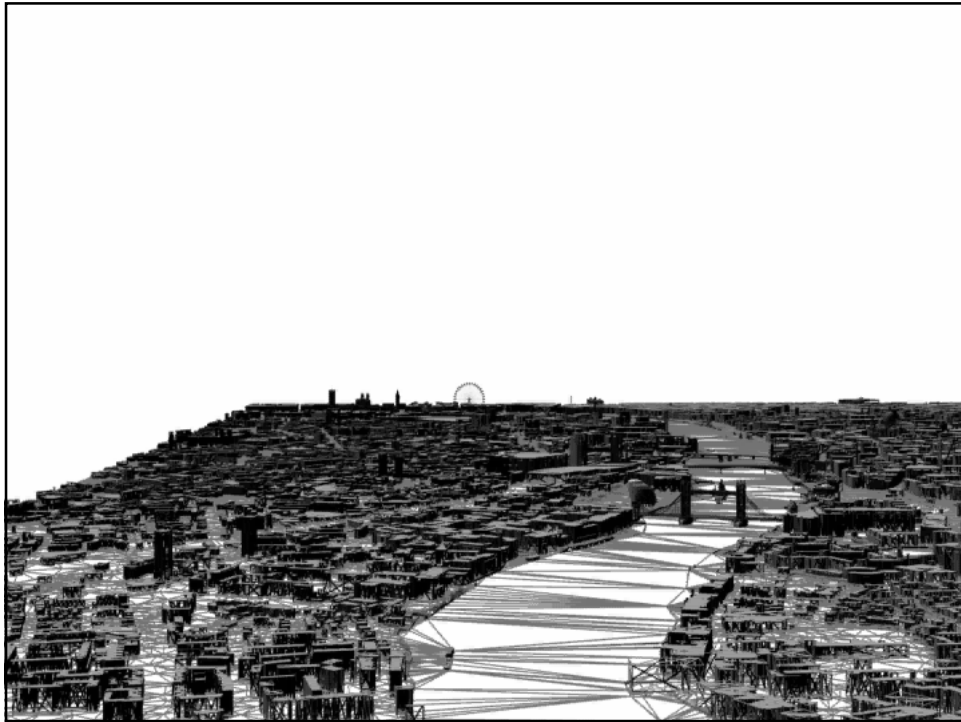
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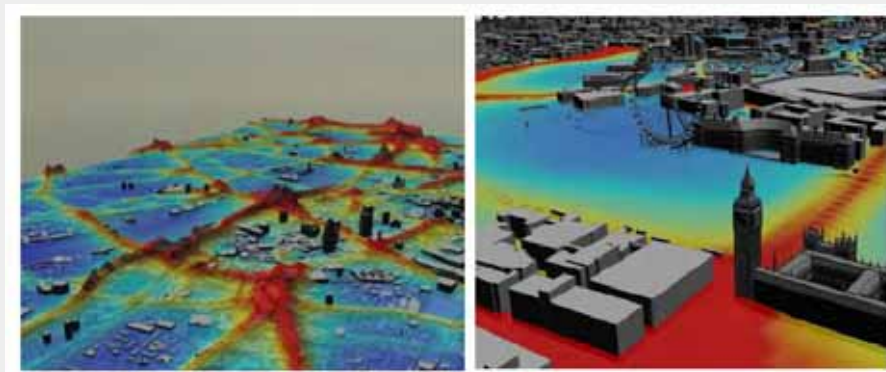


- Iconic Models: Virtual London
- For More Immediate and Obvious Visualisations of Urban Futures
- Pollution, Flooding etc.
- Running Models Online
- Models Under the Control of Different Types of User and Stakeholder
- Linking Software from Diverse Sources, from the Desktop to the Cloud

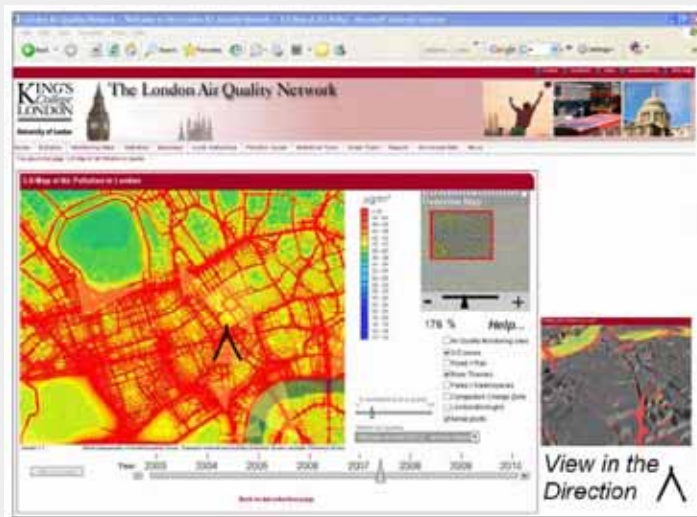




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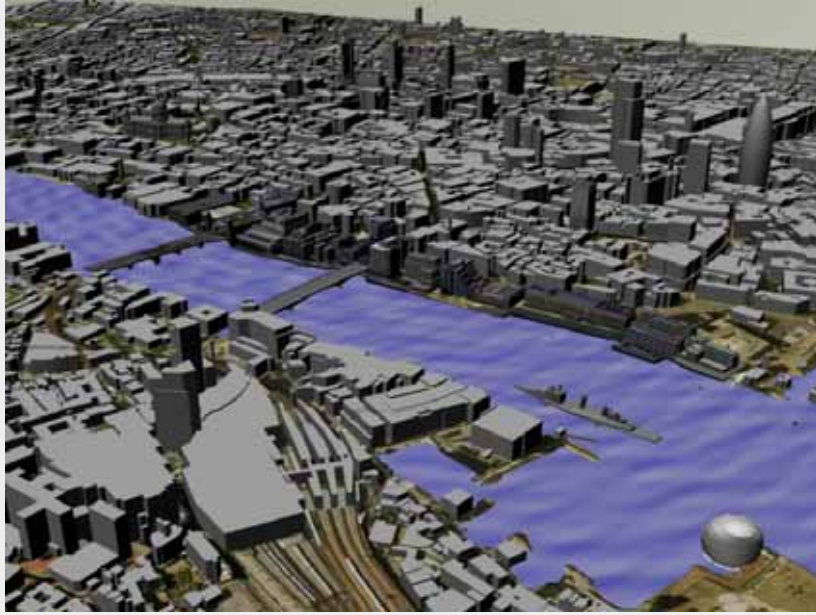


<http://www.londonair.org.uk/>

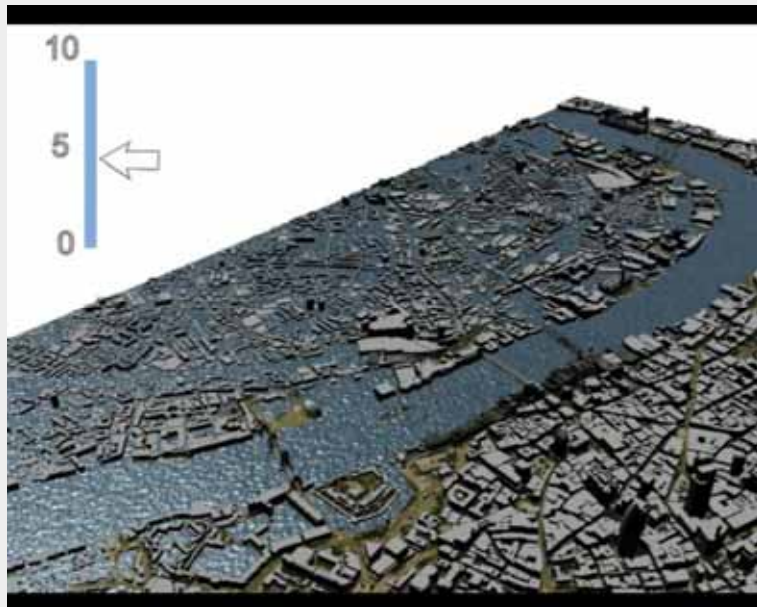


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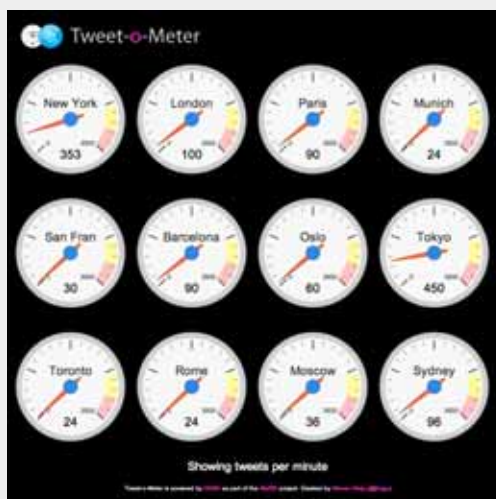
- **Tracking** New Data Sources at the Fine Scale
- Tracking from Mobile and Fixed Devices
- Visualising Movements and Interactions
- Social Networks: Twitter Feeds: Background Radiation in the City
- Formal Tracking of Pedestrians and Vehicles equipped with GPS
- Examples



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Tweet-o-Meter & Crowd Sourcing Data



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Tweet-o-Meter

Capturing Geo-location Data from all over the world

- Collects data from Twitter (mainly Geo-located Tweets)
- 30km radius from centre of each city
- Search for trends, specific topics using
 - Hash tags (e.g. #iPhone, #uksnow, #twitter etc)
 - Individual Words (e.g. CASA)
 - Groups (e.g. Carling Cup Final)
- First Experiment – Friday 22nd Jan to Monday 25th Jan
 - Area – London (All Tweets within M25)
 - **378,000** Tweets Captured
 - **60,000** Geo-located Tweets



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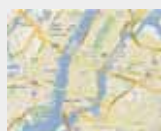
Location Based Twitter Data

New City Landscapes compared

Tweets collected using Tweet-o-Meter over a week in an urban area. We build Interactive City Landscapes showing density of geo-located 'Tweeters' that provide their actual location and message through the Twitter API



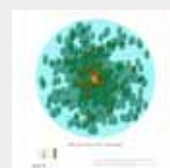
New York



London



Paris

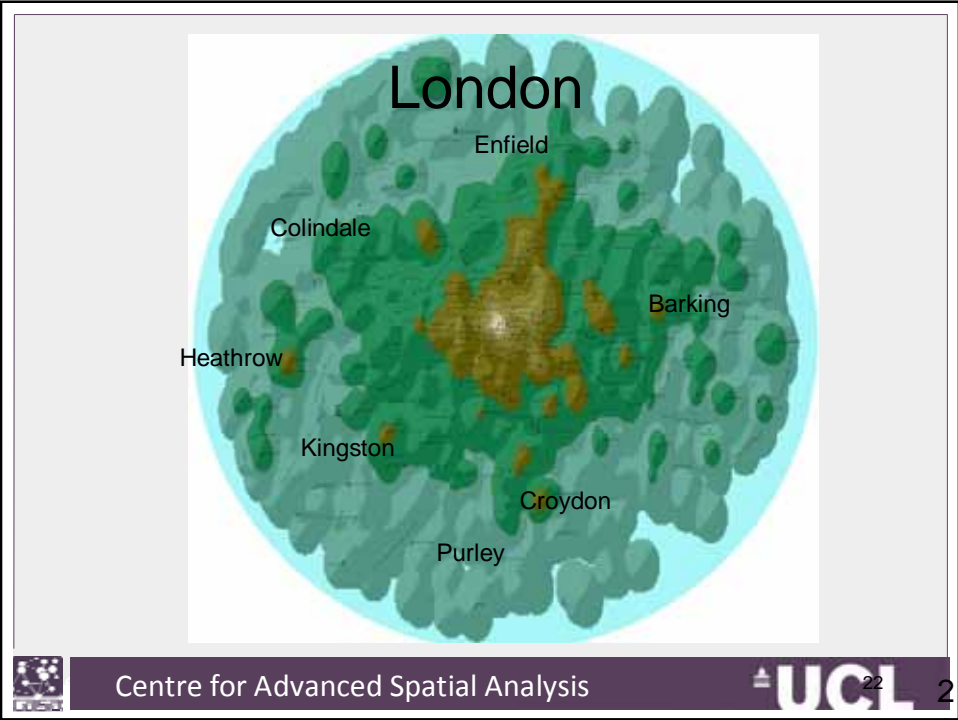
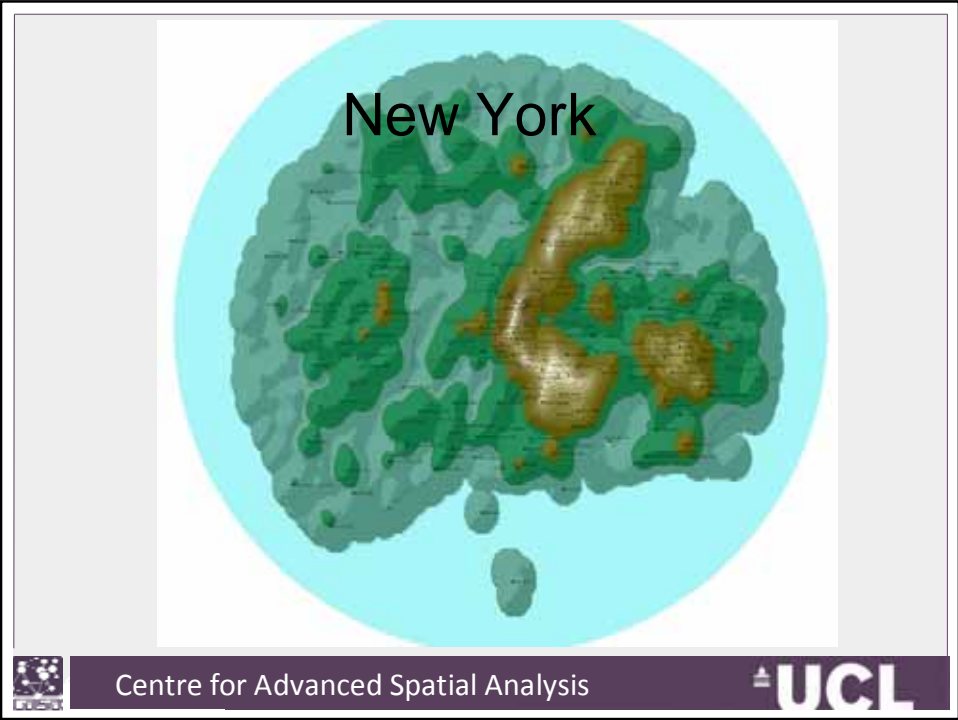


Moscow



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- **Tagging** Objects in the City
- Tagging and Interacting with Fixed and Movable Objects
- The Internet of Things, Things being anything but in our Context Objects that define the City
- Social Networks from Tagging
- Tracking of Objects that are Tagged
- Examples



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what if objects
could hold memories
and be aware of their
surroundings?



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what if memories
could be 'added' to objects?



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what if objects
could tweet?



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The logo for 'tales of things beta' features three stylized goldfish swimming around a central white fish-like shape. The text 'tales of things' is in blue, and 'beta' is in orange below it.

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A grid of six QR codes, each with a small image of an object (a teapot, a mug, a clock, a mobile phone, a rotary phone, and a book) and the URL 'talesofthings.com' below it. A smartphone at the bottom right displays the Tales of Things app interface.

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For more Information, you can view our research at:

CASA Website

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

Urban Tick Blog

<http://www.urbantick.blogspot.com>

Digital Urban Blog

<http://digitalurban.org>

Maptube: <http://www.maptube.org>

Survey Mapper: <http://www.surveymapper.com>



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