No longer lost in the crowd: Prospects of continuous geosurveillance

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Defining geosurveillance

- directed observation for the purposes of social control
- goal being to determine 'who' you are (positive identification), determine what you are 'doing' and determine an appropriate 'action' in response
- geosurveillance extends this with explicit concern over 'where' identified individuals are doing the things they are doing
- spatial privacy - notion of control over your spatial identity, the right of control over the release, storage and use of information on geographic location, activities and movement patterns
- the act of knowing where people are is changing
- new surveillance technologies on the person and throughout the environment identify people, where they are, and often what they are doing

Geosurveillance assemblage

1. **Sporadic:** 'tracking through transactions'
2. **Visual:** 'tracking by cameras'
3. **Mobile:** 'tracking through tags'

Type 1 Geosurveillance: Sporadic tracking by transactions

- surveillance at distinct point sources
- strong degree of individual identification in many cases
- generally aware that your position has been ‘caught’
- can give very precise space-time co-ordinates
- but localised, partial. intermittent trajectories
- however, historical logs can build up insightful patterns

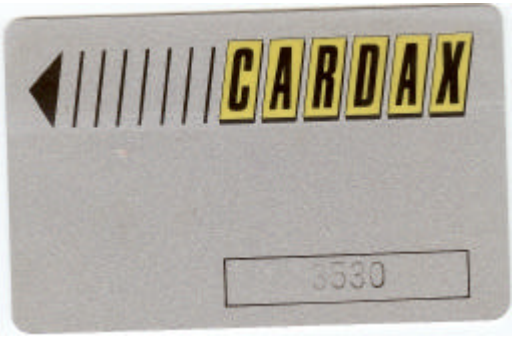
Money and consumption

- growth in volume & diversity of electronic transactions
- what would a map of your bank and credit card statement reveal?
- cross sectoral 'loyalty' cards linking purchasing habits across whole range of personal consumption locations
- see CASPIAN (www.nocards.org) for why 'loyalty' cards are 'bad'

4.7 billion payment transactions made with debit & credit cards in 2002 in UK (APACS, 2003)

e.g. Nectar 'loyalty' card linking together supermarket, garage, off-license, dept. store, utilities

From keys to cards



digitally controlled physical access (cards, pin nos.)

```
**  22/04/03  ****************************************
  10:45 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Door Access Granted
  18:00 01 Torr Pl 1-19,Ent,Out Torr Pl 1-19 Ents     Door Access Granted

**  23/04/03  ****************************************
  19:38 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit

**  24/04/03  ****************************************
No Activity

**  25/04/03  ****************************************
  16:51 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit
  19:43 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit

**  26/04/03  ****************************************
No Activity

**  27/04/03  ****************************************
  12:54 01 Torr Pl 1-19,Ent,In   Torr Pl 1-19 Ents     Door Access Granted
  17:38 01 Torr Pl 1-19,Ent,Out  Torr Pl 1-19 Ents     Door Access Granted

**  28/04/03  ****************************************
  19:22 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit

**  29/04/03  ****************************************
  19:17 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit

**  30/04/03  ****************************************
No Activity

**  01/05/03  ****************************************
  18:32 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit
  18:45 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Door Access Granted
  20:18 01 Torr Pl 1-19, Rear    Torr Pl 1-19 Ents     Valid Card Exit

**  02/05/03  ****************************************
No Activity

**  03/05/03  ****************************************
No Activity

**  04/05/03  ****************************************
No Activity
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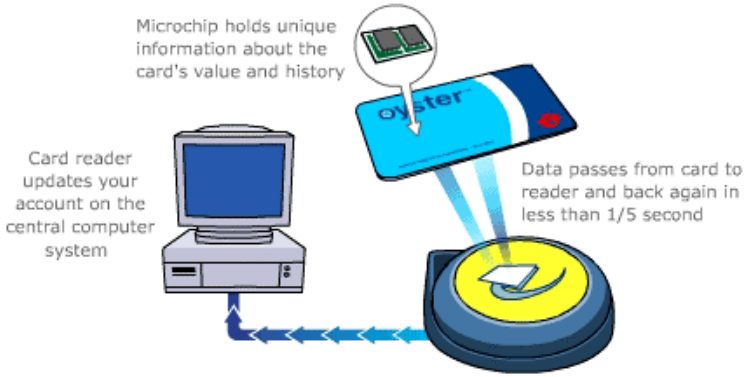
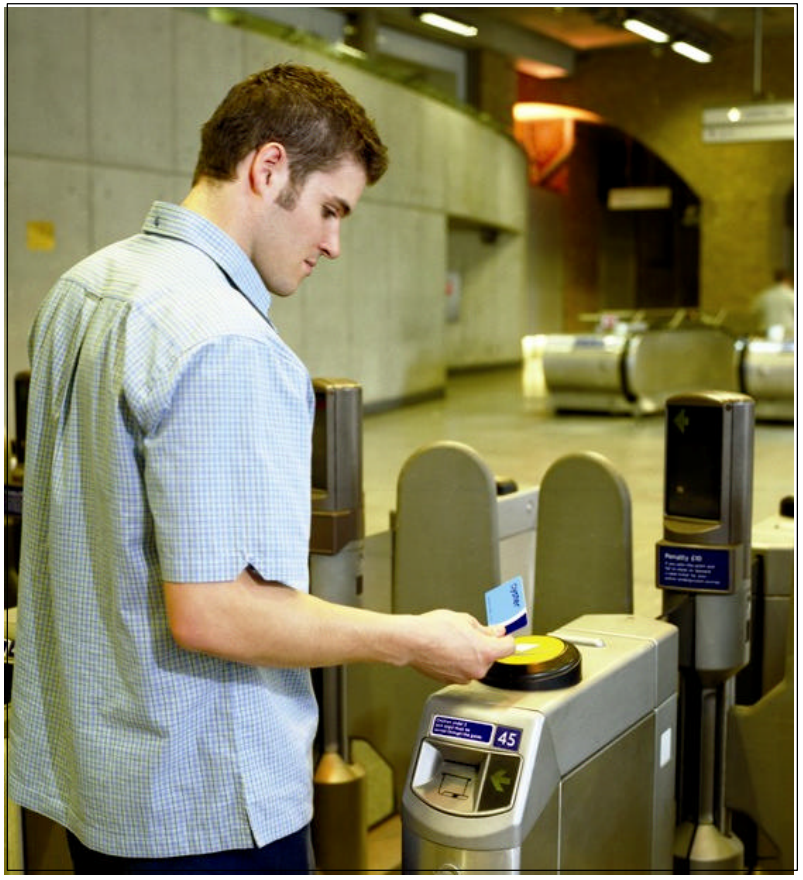
Tickets and travel





- summer 2003 Oyster smart card ticket on the Tube and buses
- 16,000+ card readers
- 1/2 million Oyster cards in use (January 2004)
- printed paper tickets are deemed obsolete
- enforced swiping on entry and exit

wanna travel in London? then get tracked

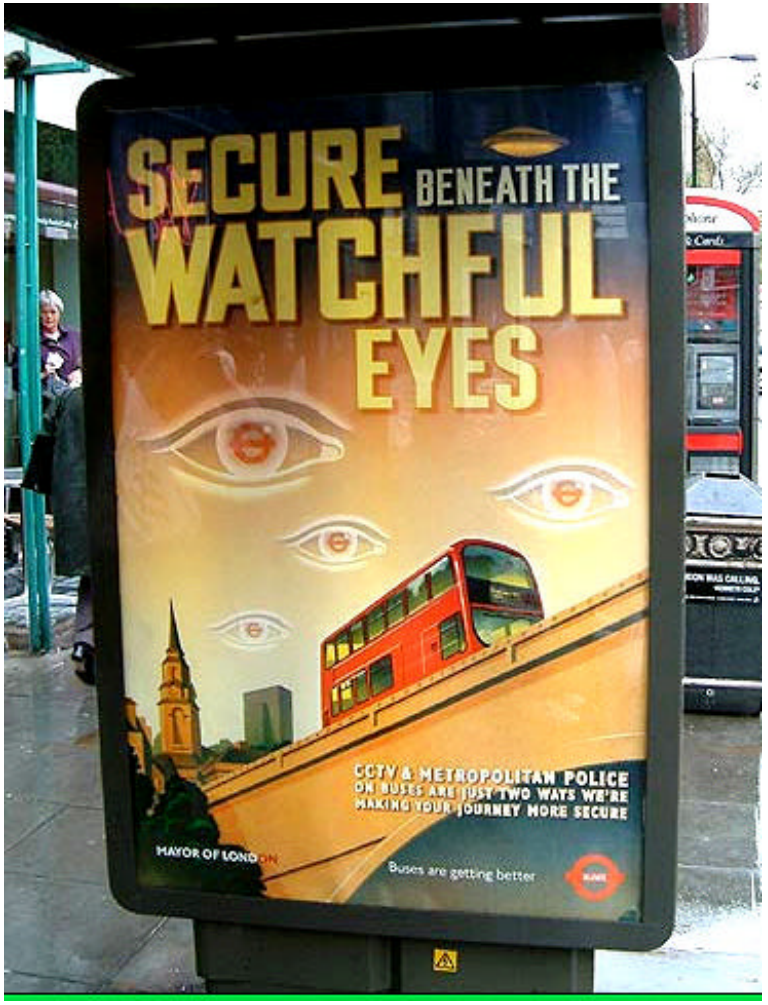
Sporadic geosurveillance

- type 1 surveillance generates a series of scattered 'dots' through the space-time trajectory of your day
- can still be very revealing, but you are the only one with a complete picture of your daily space-time trajectories
- clearly, if a third party has enough 'dots', they can do a good job at *interpolating* the complete life path
- problem is that interpolation is bad at predicting rapid changes in behaviour patterns. Which are precisely the type of ad-hoc changes of activities that are basis of 'mobile society'
- easy to duck out of type 1 surveillance (e.g. pay cash)
- although the number of 'required' dots is growing, as the potential for anonymous transactions is declining

Type 2 Geosurveillance: Visual tracking by cameras

- people tracked through the directed visual gaze of distant observers via video cameras. Potential for continuous surveillance over time
- partial and localised, but networks of cameras covering large areas
- hard to automate, but working towards algorithmic video surveillance. (cars number plates are easy, but faces are much harder)

London - camera heaven!



- many large public and private-operated street schemes
- whole of Tube is blanketed by CCTV
- inside buses, trains
- the City's anti-terror 'Ring of Steel' started in 1990s
- Congestion Charge started in February 2003
- numerous road traffic monitoring and enforcement
- average daily dose of CCTV, 300 cameras, 30 systems (Norris & Armstrong, 1999)
- camera concentration is high, but also highly variable

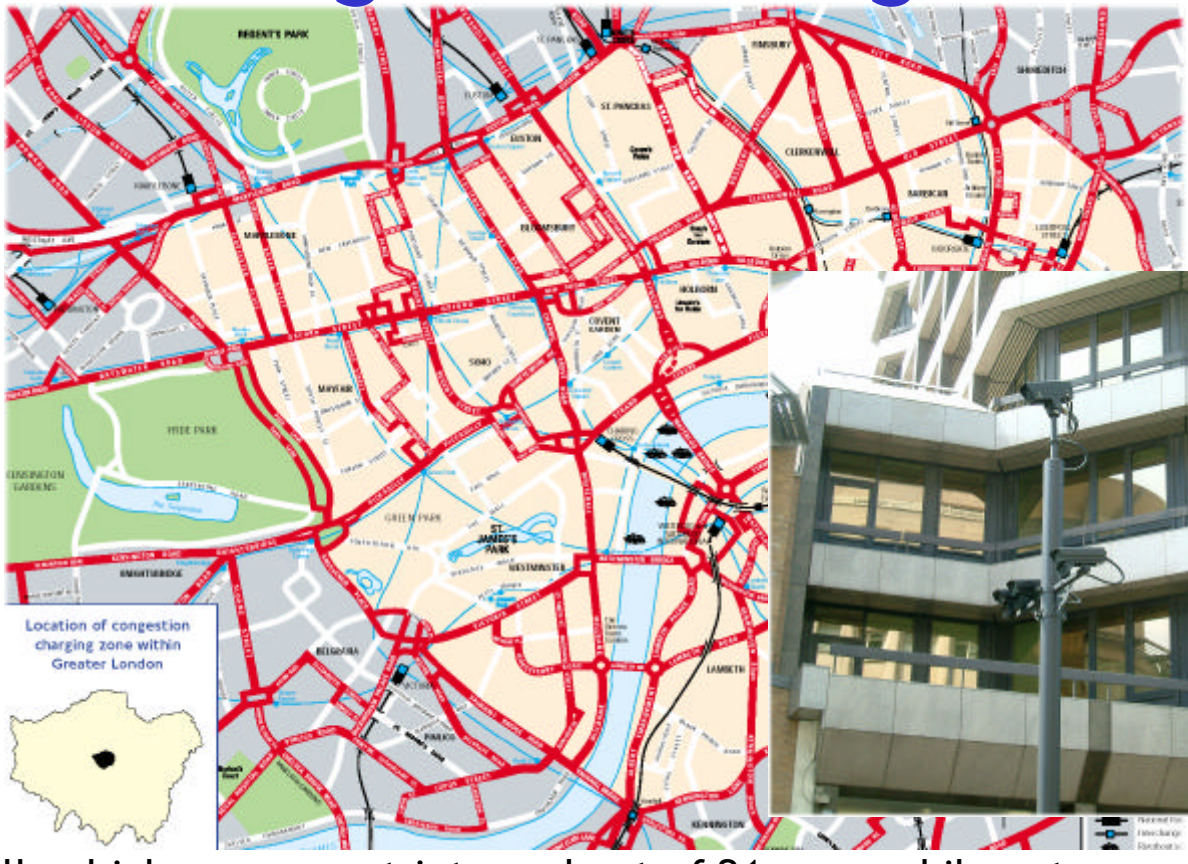
Watching the roads - monitoring and enforcement

Increasing number have ANPR and data logged

900 buses equipped

.....enforcement images recorded continuously.....

Congestion Charge



- <u>all</u> vehicle movement into and out of 21 square kilometre zone
- networked video system, 500 cameras at some 250 sites with ANPR
- watching at <u>all</u> times, including 49.4% of non-charging time
- classic case of ‘control creep’. Likely to be extended

Towards continuous geosurveillance

- Steve Graham (1998), "… incomplete, fragmented, and patchy, always partial, contingent and unevenly developed across and between the 'life-paths' of citizens."

- both type 1 and type 2 geosurveillance are partial, non-continuous across space

Type 3 Geosurveillance: Mobile tracking through tags

- growing number of locational aware technologies people use in everyday life
- 'intimate and internal' surveillance, generated 'bottom-up'
- promise (threat) of much more continuous and complete geosurveillance of your time-space trajectories

Personalised locational tags

- digital devices that identifies uniquely you and has the potential to actively 'leak' your positional data (at varying resolutions) to a control network and thus to third parties

- mobile phones (wide area cellular; global satellite)
- computer devices (PDAs, laptops)
  - local area networks (wifi); personal area network (Bluetooth links)
- involuntary tags (the vulnerable, the dangerous & the feckless)
- vehicular
  - personal cars (satellite navigation; 'black box' recorders); fleet logistic monitoring (legitimate workplace geosurveillance?)
- object tags (rfid chips 'hidden' in products) and sensor net to track them. Been used in tagging cattle and 'smart' name tags for conferences
- all have potential for covert reading at a distance

Mobile phones, the ultimate ‘body bugs’

Social network

Phone ‘leaks’ socio-spatial identity to 3rd parties

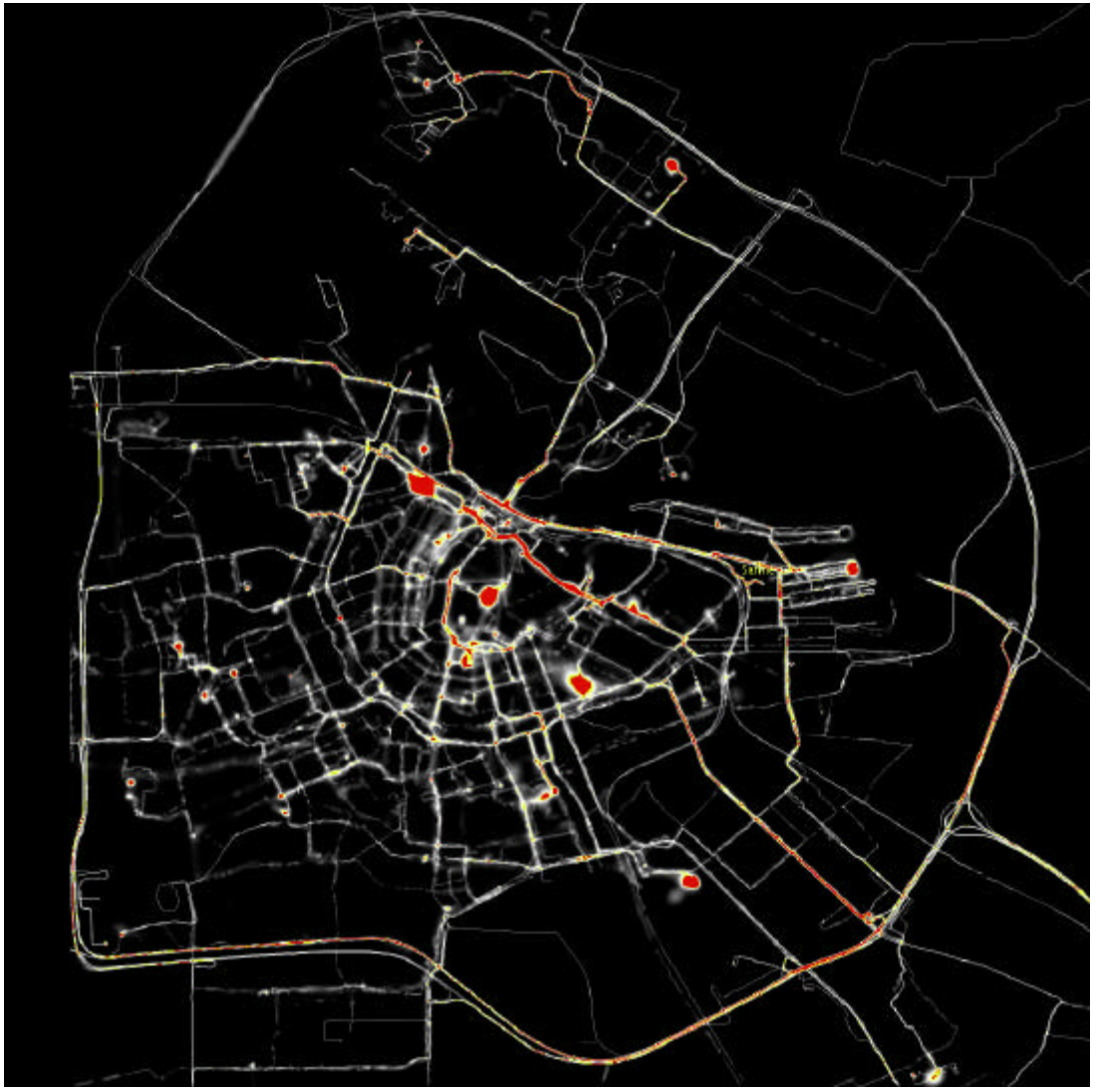
Home (geodemographics)

Space-time paths

Pinpoints location

Services, info purchased

Interests & activities



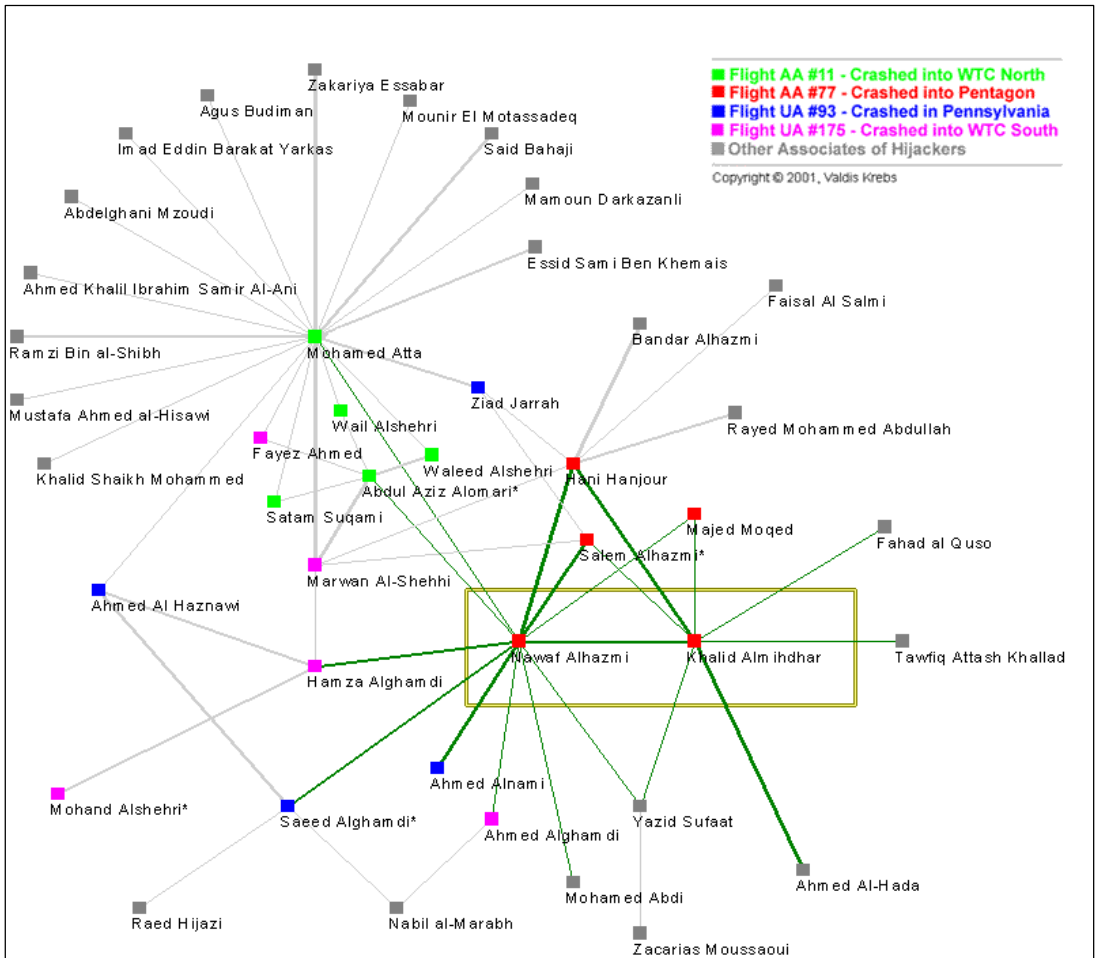


Figure 3 - All 2 step links from two known suspects

Court cases using mobile location data

BBC NEWS

You are in: N Ireland

Tuesday, 22 January, 2002, 15:24 GMT

Phone logs linked to bombing

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Omagh's devastated main street

By the BBC's Annita McVeigh

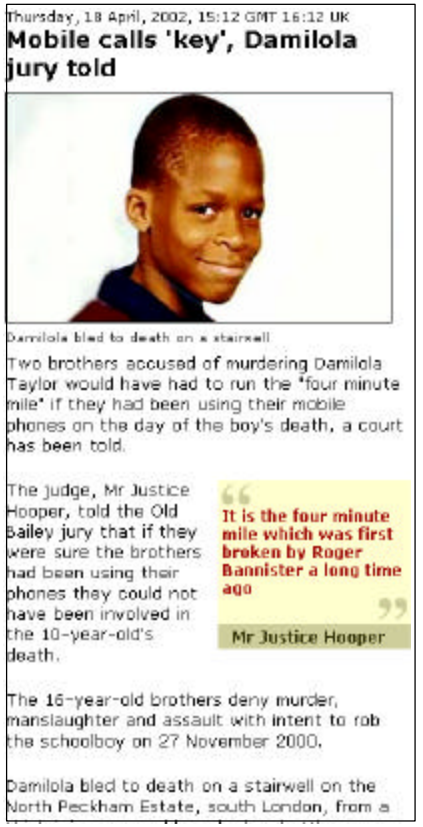
It was the 15th of August 1998, a busy Saturday afternoon in Omagh, when the bomb exploded.

The town's streets were packed with young and old, Catholic and Protestant, local people and tourists.

Twenty-nine men, women and children as well as unborn twins were killed - the biggest loss of life in a single incident during Northern Ireland's Troubles.

More than 200 people were injured, some of them maimed or scarred for life.

The device had been packed into a stolen car and left in the County Tyrone town by the Real IRA, dissident republicans opposed to the peace process.



Thursday, 18 April, 2002, 15:12 GMT 16:12 UK

Mobile calls 'key', Damilola jury told

Damilola bled to death on a stairwell

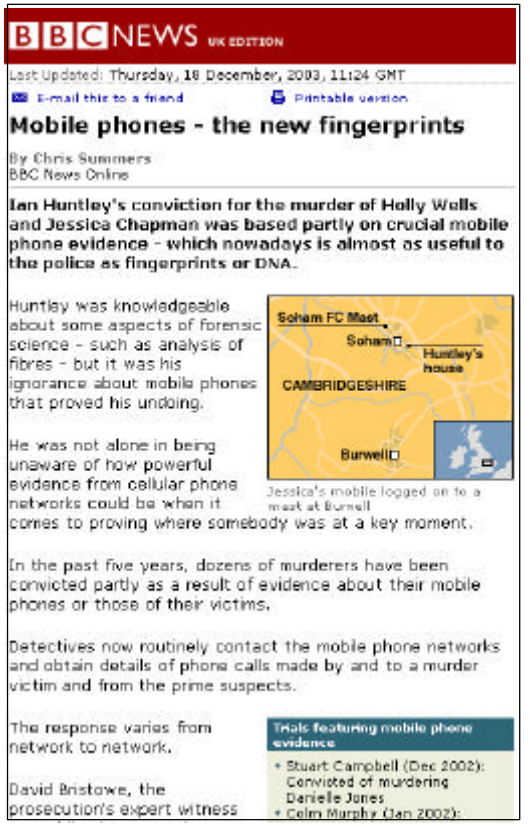
Two brothers accused of murdering Damilola Taylor would have had to run the "four minute mile" if they had been using their mobile phones on the day of the boy's death, a court has been told.

The judge, Mr Justice Hooper, told the Old Bailey jury that if they were sure the brothers had been using their phones they could not have been involved in the 10-year-old's death.

> "It is the four minute mile which was first broken by Roger Bannister a long time ago"
>
> Mr Justice Hooper

The 16-year-old brothers deny murder, manslaughter and assault with intent to rob the schoolboy on 27 November 2000.

Damilola bled to death on a stairwell on the North Peckham Estate, south London, from a



BBC NEWS UK EDITION

Last Updated: Thursday, 18 December, 2003, 11:24 GMT

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Mobile phones - the new fingerprints

By Chris Summers
BBC News Online

Ian Huntley's conviction for the murder of Holly Wells and Jessica Chapman was based partly on crucial mobile phone evidence - which nowadays is almost as useful to the police as fingerprints or DNA.

Huntley was knowledgeable about some aspects of forensic science - such as analysis of fibres - but it was his ignorance about mobile phones that proved his undoing.

Jessica's mobile logged on to a mast at Burwell

He was not alone in being unaware of how powerful evidence from cellular phone networks could be when it comes to proving where somebody was at a key moment.

In the past five years, dozens of murderers have been convicted partly as a result of evidence about their mobile phones or those of their victims.

Detectives now routinely contact the mobile phone networks and obtain details of phone calls made by and to a murder victim and from the prime suspects.

The response varies from network to network.

David Bristowe, the prosecution's expert witness

Trials featuring mobile phone evidence

- Stuart Campbell (Dec 2002): Convicted of murdering Danielle Jones
- Colm Murphy (Jan 2002):

Alibi for the defence, incriminating evidence for prosecution

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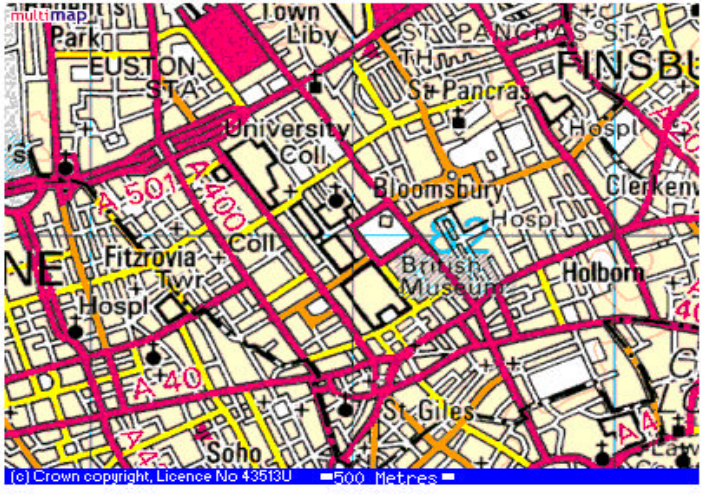
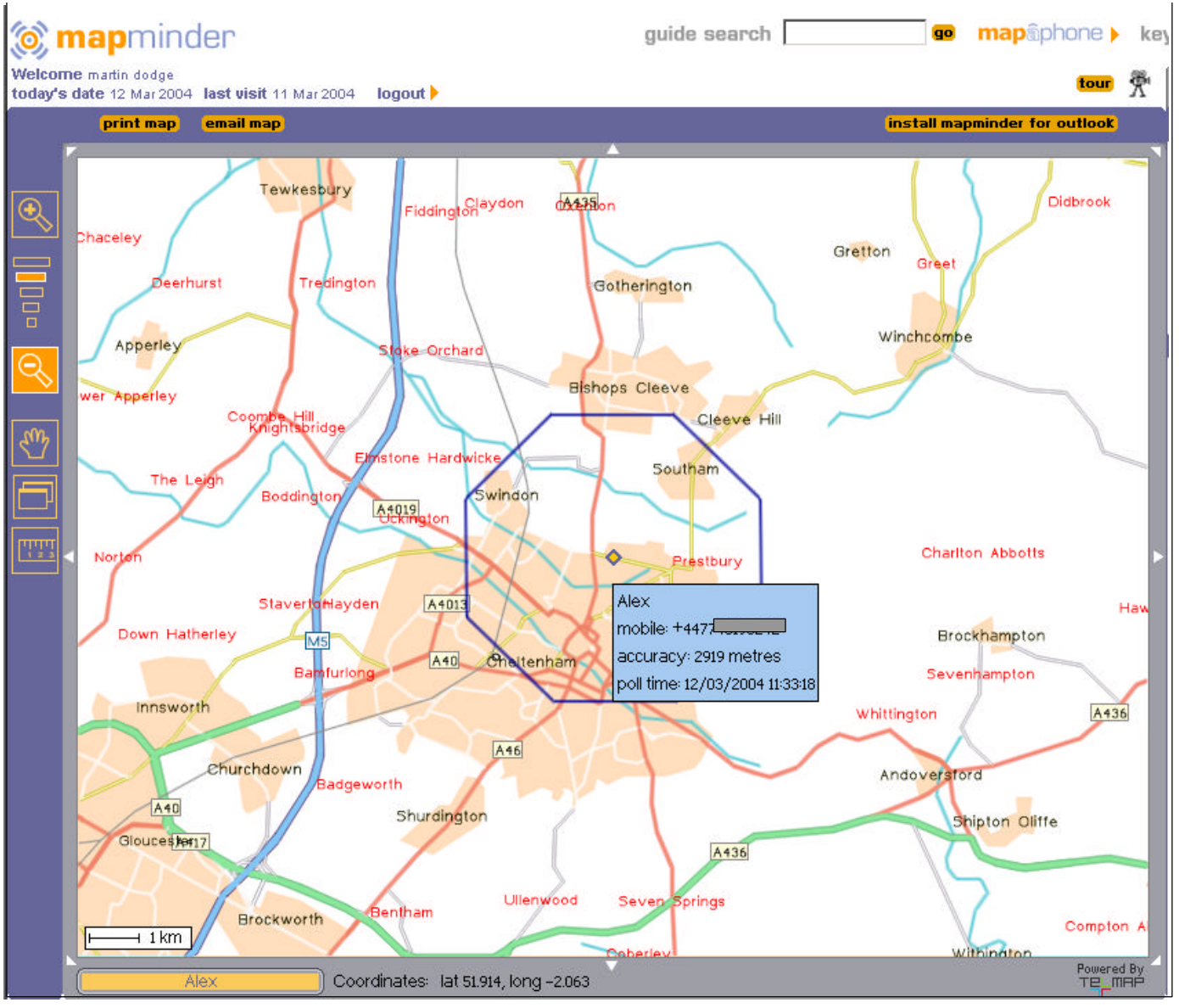
Location

Steve Coast (07[redacted]1) is in the vicinity of RUSSELL SQUARE, LONDON, WC1B4HR

Result	OK
Accuracy	0.7 km
X Coordinate	530152
Y Coordinate	181991
Data/Time of fix	11/03/2004 11:07

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Winchcombe
Apperley
Stoke Orchard
Bishops Cleeve
Cleeve Hill
Coombe Hill
Knightsbridge
Elmstone Hardwicke
Southam
The Leigh
Boddington
Swindon
Ullenwood
Norton
Prestbury
Charlton Abbotts
Staverton
Hayden
Down Hatherley
Brockhampton
Bamfurlong
Cheltenham
Sevenhampton
Innsworth
Whittington
Churchdown
Badgeworth
Andoversford
Shurdington
Shipton Oliffe
Gloucester
Brockworth
Bentham
Seven Springs
Compton A
Alex
mobile: +4477
accuracy: 2919 metres
poll time: 12/03/2004 11:33:18
A435
A4019
A4013
A40
A46
A436
M5
1 km
Alex
Coordinates: lat 51.914, long -2.063
Powered By
TE_MAP

Discourses of geosurveillance

- will to power to 'number, weigh and divide'. The unstated goal: *all people, at all places and all the time*
- securitisation, move to the control society. Spurred by 'signal crimes' (Innes 2001)
- the 'position of safety'. Risk reduction is rational win-win for business and consumer. Selling protection from fear, insecurity and sense of urban alienation
- emergency services (911 locate)
- consumer services push, 'geo-spamming' (LBS revenues to pay back those expensive 3g licenses)
- efficiency and time-space maximisation
- locative media. 'Bottom-up' from artists and activists (lets have some fun, community empowerment)

Concerns

- casual knowledge of position. Becomes as common as clock time
- providers and operators are lacking in transparency. Little specific detail on what they collect, how long they keep it, how they process it, how they applying derived information, to whom they release. Very cagey about what they know and what they want to know
- 'control creep' (Innes 2001)

- easily drawn into governmental security systems
  commercial consumption profiling systems

- moving from discretionary to mandatory
- beyond personal privacy. Enabling and disabling potential. Facilitates further discriminatory practices. Mobile sorting of people based on their geographic activity patterns
- continuous geosurveillance through everyday uses of locational tags will become a dimension of the control society. There will be no sense of being lost in the crowd

Welcome to the ‘tin foil’ world

- Is off really off?
- technical ‘solutions’ to foil always-on geosurveillance. New markets for foil lined wallets and bags
- technical arms race via personal shielding of smart cards, mobile phones from covert reading
- but might then show up by ‘going off the map’ and thus be flagged as suspicious….
- will ambivalence to geosurveillance continue?

(source: www.spy.org.uk/spyblog)

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