

- EC (2001) *Nordic.Regions@Information.Society.eu—Success Stories from Denmark, Finland and Sweden* (Luxembourg, Of@ce for Of@cial Publications of the European Communities).
- Gillespie, A. (1991) Advanced communication networks, territorial integration and local development, in: R. Camagni (Ed.) *Innovation Networks: Spatial Perspectives* (London, Belhaven).
- Graham, S. & Marvin, S. (2001) *Splintering Urbanism—Networked Infrastructures, Technological Mobilities and the Urban Condition* (London, Routledge).
- Leadbeater, C. (1999) *Living on Thin Air—The New Economy* (London, Viking/Penguin Books).
- OECD (1999) *Boosting Innovation: The Cluster Approach* (Paris, OECD).
- SPECTRE (2002) See <www.spectreproject.net>.
- SQW (2002) *Advantage through ICT—An ICT strategy for England's North West*. Report for Northwest Development Agency and North West Regional Assembly (Cambridge, SQW Consultants).
- Wheeler, J.O., Aoyama, Y. & Warf, B. (Eds) (2000) *Cities in the Telecommunications Age* (London, Routledge).
- Wilsdon, J. (Ed.) (2001) *Digital Futures* (London, Earthscan Publications Ltd).
- Yorkshire Forward (2001) *Competing Globally: Growing Your Business through Clusters* (Leeds, Yorkshire Forward).

CCTV: The Stealthy Emergence of a Fifth Utility?

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One of the most visible interactions of place and high-technology communications systems over the past 10 years has been the installation of Closed Circuit Television (CCTV). Designed to improve the economic fortunes of public, commercial street systems, such technologies are so widespread that it has been estimated that the average UK urban resident is now monitored more than 300 times a day, making Britain the most visually surveilled nation on Earth (Norris & Armstrong, 1999).

CCTV systems integrate state-of-the-art surveillance cameras, often with remarkable resolution and infra-red night time capability. Video recorders are used to record the images from all cameras for use in criminal prosecution and police investigation. Often, such systems include sophisticated computer-assisted scanning operations, motion-detection facilities, loudspeaker systems and zoom capabilities. The activities of a particular vehicle, or a 'person of interest' in police parlance, can now be tracked from a single control room through most town and city centres, day or night. Large public CCTV systems tend to 'fill in' the spaces left between by a myriad of *private* CCTV systems. Private systems now cover everything from football stadia, banks, pubs, cash machines, shops, shopping malls, transport networks, buses and trains to schools and universities, hospitals and of@ce blocks, workplaces, fast-food restaurants, garage forecourts, industrial areas, business parks and even domestic houses. The shift to 'smart' highways has inevitably involved the wiring up of roads with CCTV. Real and mock CCTV cameras are also a fast growing element of the trend towards the 'fortressing' of many individual houses and elite neighbourhoods. Security magazines offer DIY packages for domestic CCTV, whilst in London Belgravia and Hampstead Garden Suburb have set up privately-operated CCTV systems. Given this huge growth in CCTV coverage this article critically explores the development of this trend and the implications such technologies have for the nature and experience of space and place for *all* members of society.

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Economies of Scale and Scope in CCTV Expansion

Once CCTV systems are installed, their logic is inevitably expansionary. Economies of scale are very marked—once a system is built and monitoring personnel are employed, it makes sense to cover larger and larger areas. Communities and businesses occupying uncovered spaces clamour to get CCTV cover and so avoid any ‘overspill’ effects, as crime moves away from covered areas. Economies of scope are also important in CCTV expansion. New uses are constantly being found for CCTV beyond its initial purpose: from traffic monitoring, checking the performance of street cleaners, monitoring graffiti, preventing under age smoking to preventing terrorism (or at least providing evidence for tracking down terrorists after attacks). Whilst CCTV systems covering roads and motorways are usually installed for traffic management, it is easy to extend their function to include supporting road pricing, enforcing speed limits, and tracking for suspects and stolen vehicles.

The current shift from analogue to digital, computerized CCTV systems also supports expansion. Digital, algorithmic techniques, like those currently being used in the City of London’s ‘Ring of Steel’ system and the system in Newham, East London, allow much larger systems to be automatically monitored because the systems can be programmed to automatically search for ‘abnormal’ or ‘unexpected’ events, behaviours or even people. In the City of London, cars moving the ‘wrong’ way down a street automatically trigger cameras to monitor the scene. Additionally, by linking digital CCTV with image database technology, ‘algorithmic’ CCTV systems can be programmed to automatically scan for specified faces or car number plates or to ensure that people are where they ‘belong’. Such systems are being widely trialled in airports, sports stadia and public spaces in the wake of the September 11th terrorist attacks (Agre, 2001).

Parallels with the Development of Utilities in the 19th-century City

The most striking thing about the wiring up of Britain with CCTV is how similar the process is to the initial development in 19th-century cities of the networked utilities such as gas, electricity, water and telecommunications that are now taken for granted. Whilst we now assume such networks to be ubiquitous and treat them as invisible supports to every aspect of our lives, this was not always so. In the 19th century, water, waste, energy and telegraph utilities first emerged as small, specialized networks, geared towards a myriad of uses, utilizing wide ranges of technologies and covering only small parts of cities. These networks sprang up through complex patchworks of both public and private entrepreneurship. Industries started their own electricity and water networks; town gas networks were built by ambitious municipalities for lighting their streets; and the first phone and telegraph networks were initially used mainly by large businesses and emergency service providers (see Graham & Marvin, 2001).

These networks, of course, have long since merged and extended to become technologically standardized, multi-purpose, nationally-regulated utilities, with virtually universal coverage. The social and economic modernization of society since the 19th century has been inextricably bound up with integrating the many small scale utilities together as part of the national ‘roll out’ of (relatively) standardized energy, water, waste and telephone networks. By the 1950s people took it for granted that across the whole country they could make direct dial phone calls, heat, light and power their homes with electricity at a standard voltage and access clean, running water and (in all but the most

remote areas) sewerage networks. The massive utility networks necessary to deliver these services were operated by large public monopolies who exploited economies of scale and scope and were regulated at the national level to ensure consistent quality, standard tariffs, and universal coverage.

The Rush to Ubiquity: Normalization, Regularization and the Fear of Unwatched Spaces

It can be argued that CCTV looks set to follow a similar pattern of development over the next 20 years, to become a kind of 'fifth utility'. Coverage seems set to extend towards ubiquity, to become more multi-purpose, to be regulated nationally, and to adopt standardized technologies. Every murder, school break-in or terrorist act further intensifies the spiral of demands for ubiquitous surveillance. Digital compression techniques, web cams and the development of the Internet and broadband cable networks are already providing the infrastructure for people and organizations to simply plug in and rent their camera networks, much as we use phones or lease lines today. An emerging culture of private, remote monitoring already offers parents the ability to view their children at nursery throughout the day at some US child-care centres. Micro-cameras, automated tracking, image database and facial recognition techniques are already enhancing the cost-effectiveness of CCTV. The more CCTV coverage becomes the norm, the more excluded areas will fight to gain coverage.

As with the extension of gas, electricity, phone and water networks, toward national coverage earlier this century, the rush to ubiquity is on. Already police forces in London have started to look into a London-wide registration system for CCTV cameras to aid their anti-terrorist investigations. National efforts to regulate and standardize CCTV are intensifying, not only to help allay public fears of abuse of the systems, but so that they can be used to fight terrorism and to correlate crime and behaviour patterns in real time. Electronic tagging systems in the US are already starting to track their wearers' movements so that they can be correlated in space and time with crime incidence.

CCTV is thus well on the way to becoming our fifth utility. In the near future we can speculate about people worrying when they are *not* under the soothing effect of some 'friendly eye in the sky' just as they do when beyond the reach of electricity, power, water, flushing toilets or fixed or mobile telephony. (In the same way the middle classes of the 19th century feared the spaces beyond the initial lit commercial cores of the metropolis.) However, it is unlikely that some single, national CCTV system will develop in the model of the water boards or gas boards of the post-war era in Britain. Since their privatization, UK utilities are now made up of a myriad of competing private companies covering different areas, offering different services and geared to different niche markets. Street systems, too, are increasingly fragmented and managed by a range of public, public-private and private bodies (Graham & Marvin, 2001). The CCTV utility is emerging in the same way. There is likely to be some form of national regulator and a myriad of service providers from the telecoms, cable, media, security and IT industries, offering many different types of service, from simple 'watch your home while away' to mobile, private web-cams and videophones, to enormous networks covering all the premises of a multinational or multi-site organization with algorithmic systems automatically sensing for what is deemed unusual at any given place.

The Dangers of Systematizing and Automating the Exclusion of 'Failed Consumers'

The worry, of course, is that the emergence of a CCTV utility will systematize processes of exclusion and discrimination and embed them within automated, algorithmic, invis-

ible systems of (attempted) social control. What is seen to be 'abnormal' or 'threatening' within automated CCTV tracking systems will, after all, be defined through the opaque definitions of software code. This will often occur tens of thousands of miles away from the points of surveillance in some distant R&D lab. What is to stop this code being explicitly defined to concentrate the cameras' power on, say, young black men, people selling (homeless) magazines, or, as already happens in some US malls, people who simply sit down or 'loiter' for periods deemed by power holders to be too long for the imperative of maximum profitability and commercial throughput?

To back up the wider gentrification and privatization of urban commercial cores, sophisticated systems are likely to emerge which actively scan for the 'failed consumers' of the metropolis, utilizing increasingly privatized policing and security practices to ensure their subtle (or not so subtle) removal. Indeed, such practices are already widespread in the use of non-digital CCTV within Town Centre Management (TCM). In 1998, for example, the private managers of the Covent Garden market centre in London decided to 'exclude vagrants' from the piazza (Daly, 1999). Around the UK, as competition for higher-income consumers intensifies between out-of-town malls and city centres, management strategies are combining street theming, private policing and CCTV on public streets. Users deemed to be 'unaesthetic' or 'antisocial' are often managed out or pushed elsewhere: 'junkies', 'down and outs' or others who, in the words of one Town Centre Manager, 'make the town degraded' are not welcome (cited in Reeve, 1996, p. 70).

In practice, TCM schemes have been found to discriminate actively against [beggars and street people] in order to massage the social space of a town centre into something more socially conducive to consumers' (Reeve, 1996, p. 78). Moreover, in the UK, CCTV schemes, which back up such street management programmes, have been widely found to target people for 'no particular reason' than 'belonging to a particular subcultural group' (Norris & Armstrong, 1999). Black people, in particular, 'were between one-and-a-half and two-and-a-half times more likely to be surveilled than one would expect from their presence in the population' (p. 3). Through CCTV, people and behaviours seen not to 'belong' in the increasingly commercialized and privately-managed consumption spaces of British town and city centres tended to experience especially close scrutiny. Norris *et al.* (1998) found CCTV control rooms were ridden with racism and sexism. Certain types of young men were targeted with socially constructed suspicion being labelled ('toerags', 'jobs', 'scrapheads', 'Big Issue scum' [named after the UK's homeless magazine] and 'drug-dealing scrotes') and consequently scrutinized, followed and harassed. Malign intent was equated with appearance, youth, clothing and posture. Thus, CCTV operators are already imposing a 'normative space-time ecology' on the watched parts of the city, stipulating who 'belongs' where and when, and treating everything else as a suspicious 'other' to be disciplined, scrutinized, controlled (Graham *et al.*, 1996).

The diffusion and automation of CCTV, and its linkage to digital image databases, however, means that the normative assumptions about the value and risk associated with particular individuals moves from the discretion of human practice to be embedded within the opaque codes of computer systems. Such a development would mean 'a tremendous change in our society's conception of a person' (Agre, 2001, p. 3). It would have dramatic implications for the nature of places, politics, planning and democratic practice, as automated, opaque systems start to inscribe complex normative ecologies of 'acceptable' people and behaviour into the fabric of urban places on a continuous and largely unknowable basis. Whole sections of cities might be continually 'red-lined',

not through the demarcation of spatial zones for receiving poorer services, but through the automated scrutiny of individuals. Individuals will be excluded when venturing into the premium commercial spaces of *their* city due to their appearance, habits or challenge to dominant power holders' normative concepts of who belongs where and when within the city. One thing, above all, is very clear: these trends mean that the politics of the street need to be quickly linked to the politics of code in critical research and practice.

References

- Agre, P. (2001) Your face is not a bar code. Available at <<http://dliis.gseis.ucla.edu/people/pagre/barcode.html>>. Accessed 23 January 2002.
- Daly, B. (1999) Covent Garden to 'exclude vagrants', *Big Issue*, 11 March.
- Graham, S. & Marvin, S. (2001) *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London, Routledge).
- Graham, S., Brooks, J. & Heery, D. (1996) Towns on the television: closed circuit TV systems in British towns and cities, *Local Government Studies*, 22(3), pp. 3±27.
- Norris, C. & Armstrong, G. (1999) *The Maximum Surveillance Society: The Rise of CCTV* (Oxford, Berg).
- Norris, C., Moran, J. & Armstrong, G. (1998) Algorithmic surveillance: the future of automated visual surveillance, in: C. Norris, J. Moran & G. Armstrong (Eds) *Surveillance, Closed Circuit Television and Social Control* (Aldershot, Ashgate), pp. 255±267.
- Reeve, A. (1996) The private realm of the managed town centre, *Urban Design International*, 1(1), pp. 61±80.

Mobile Phones, Place-centred Communication and Neo-community

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The mobile phone has become part of the needs and hopes of the modern individual. It is an electronic communication device which has changed the way people live, through the introduction of mobile phone oriented companionship and tele-sociality. At the same time there are links to older forms of interaction. The incorporation of mobile phones into our way of life is therefore a two-way process: the device is not only adapted to the way people live but ways of living are also changed as a consequence of the device (Kopomaa, 2000).

The development of mobile phones seems to be a seamless extension of the rapid growth of mobility. Modern people thrive in streets, squares, department stores and cafes. They escape the monotonous, possibly even controlling atmosphere at home, perhaps redirecting desires outside the home towards the social contacts to be found there. The digital lifestyle flourishes in public places. The attraction of public spaces is their ability to provide stimulation and pleasure. The mobile phone allows one to always be 'at home'. It may constitute a virtual agora, a meeting place, a game or a smart device for the processing and management of information. The urban character of the modern lifestyle is also revealed in that mobile phones are now used as a tool which facilitates contact with nature. A portable phone is easy to take along whether you are going to a summer house, boating or whatever, and it also provides an element of safety and security.

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