**home@Singapore.world: The spatial imaginaries of a mediated world**

Mike Crang, Durham University

FIGURE 1 AROUND HERE

'Our historic time is defined fundamentally by the transformation of our geographic space.'(Castells 2000, page 18)

**Introduction:**

That the world is globalizing has become a shibboleth and that the flows of information and media increasingly render the world into a global village has been a commonplace of commentary and punditry. In this essay, I seek to probe a little bit more how we see spaces inflected by globalised media – specifically what shape global space might be said to be. To do this I want to review some of the ways that media and information have been imagined relating to spaces – through notions of substitution, derealisation, transcendence and thence to consequence of dispersal, distanciation and social disintegration. From here I turn to examine the production of spatial relations through media, specifically notions of proximity and distance, centrality and peripherality. The analysis here will then turn to the case of Singapore which has sought to envision itself, and be seen by others, as a central hub in a new space of mediated global flows. In and through this account what I want to suggest is that very different spatial imaginaries are mobilized – indeed that these mediated spaces enact and produce different notions of spatiality.

Initially I outline how conventional, even critical, accounts produces pit 'place' against 'space', where a virtualization is seen as transcending or eroding experiential place. Thence I shall try to suggest instead a more relational space is produced. This then is in distinction to imaginaries that see either a scalar shift where globalised and mediated processes start to operate at a global scale, becoming disembedded from previously sedimented territorial scales, or one where a global exterior erodes or overwhelms a local interior. Thus we might look at the effects of global information as disrupting the Russian doll like spatial imaginary of nested scales of belonging and priority, with the local as most immediate through to the distant and attenuated world scale. Accounts here might look at a rescaling of key processes, where global process now outweighs local and produce a hierarchy of (conflicting) scales of processes. Instead the approach here sees places as always having been constituted out of relations between practices, as being produced through a variety of processes occurring between places. Places are the sites of entanglement of practices, and are produced by their relations. In this sense then relational space has a Leibnizean caste, that sees space created through the relations of objects rather than being a substantive matrix into which objects are inserted. This does not allow some notion of an Aristotelian

inhabited place opposed to Cartesian, abstract space – an imaginary I shall show haunts much media commentary. That is where we can see in globalization that 'chaos and complexity have switched polarities from negative to positive, so too are all the expressions of disjunction and discontinuity being revisited as forms of a higher order… [But] Unlike the disjunction of collage that has characterized much of this century, the new disjunction is one of morphing' (Novak 1995) and to make the distinction clearer the latter involves 'warpage, not mechanics, not even alchemy, but the curving of the underlying spatial matrix itself' (Novak 1997). Thus what I am trying to suggest here is not simply the combination or coming together of new elements but the formulation of spatial orientation brought upon by global flows on information. It is then a Deleuzian vision, informed by theorizing multiplicity and hybridity, which sees the city as an abstract machine combining different kinds of spaces in a folded, pleated topology (Crang 2000b, page 314) .To do this I will focus upon the case of Singapore, as a city which has ridden the dragon of informational technology for 30 years and try to explore how it has formed a point where different relations and spaces recombine disrupting scalar notions of belonging and engagement, where the state is actively attempting to produce a sense of centrality but also one where borders are being reinscribed in informational space.

**Media against place**

One starting point to see spatial imaginaries deployed aorund global media might be the claims that reached their apogee in the dot.com boom that Information and Communication Technologies (ICTs) were doing away with the tyranny of geography, that, in Bill Gates's phrase, a 'friction free capitalism' was imminent. This 'liberation' would mean that spatial propinquity was no longer so, if at all, significant as a rationale for organising life or capitalist divisions of labour. In this vision, ICTs replace and substitute for interactions previously conducted in person, and these processes can now be distantiated globally. Thus relations of spatial propinquity and contiguity were depicted as being replaced by the connections of ICT networks. Many pundits argued that 'access to appropriate information and communication technologies has become as significant to households and communities as their physical location' (Little 2000, page 1813). Or, rather more subtly, that urban sociality would be disembedded from the physical city so that it 'switches the emphasis of urbanity from physical built form to the quality of interaction in cultural life through the exchange of information'(Little 2000, page 1814). At one level, this is about using ICTs not just to transcend spatial barriers, but to create a new

informational or 'cyber' spaces redolent with the freedoms that have been argued to characterise the metropolitan urban realm (Crang 2000a). An example of such liberatory power might be the ability of minority groups, such as gay men and lesbians, in socially repressive milieus to reach out to a wider communities elsewhere.

One reading of this is a 'global space of flows' (Castells 1989; 1996) overriding emplaced politics, cultures and ways of life. While Castells' work is sensitive to the possibilities of new networks of resistance enabled through multiplying and crosscutting global connections (see for instance Castells 2000), he tends to portray the flows as 'out there' linking places, rather than also 'in here'. The framing of these issues tends then to be one 'where "global" and "local" social process have been framed in binary opposition, as mutually exclusive and inherently antagonistic explanations for urban development which pit local cultures against globalizing economic transformations' (Smith 2001, page 2). Somehow, it seems, forces of change are always dynamically global while stubborn resistance is the best that places can muster in this script. We should be suspicious of this habitual coding of the lived and everyday as small scale and local and not equate 'the human with the near and local, the slow and the small' (Thrift 2004, page 54) and the informational world with the fast and far flung, where presence and virtuality are opposed. Rather we need to think of near-and-far attachments operated through a variety of media.

Distanciation & Derealisation

Certainly though media challenge, or at least cause us to revisit, some fundamental assumptions or historical trends based on the organisation of life through physical copresence. Thus the city's role in condensing contacts and activities into a localised space -- *the compression of time via space* – is challenged by new electronic connectivities that enable simultaneous action at different locations -- *the compression of space by time* -- which leads to a temporal intensification rather than a spatial one. Taking the work of Paul Virilio, media are thus seen to create a 'crisis in the notion of physical dimension' where the 'tyranny of distances' between geographically scattered people gives way to the `tyranny of real time' and the 'city of the past slowly becomes a paradoxical agglomeration in which relations of immediate proximity give way to interrelationships over distance' (Virilio 1993, in Graham 1998, page 170) and thus we move from an urbanization of real space to an urbanization of real time (Virilio 1997a, page 7). As Virilio puts it, urbanites are now 'interlocutors in permanent transit' so that the 'old agglomeration disappears in the intense

acceleration of telecommunications, in order to give rise to a new type of concentration: the concentration of a domiciliation without domiciles' (Virilio 1997b, page 385).

This notion of temporal acceleration, spatial detachment and experiential derealisation finds its apogee with Virilio's sense that 'constructed geographical space has been replaced been by chronological topographies, where immaterial electronic broadcast emissions decompose and eradicate a sense of place' (Boyer 1996, page 19). Accordingly Virilio implicates 'Telecommunications in dissolving the "here" and the "now", serv[ing] both to break down distance, physical distance, and to create psychological "distance" ' (Leach 1999, page 77). This occurs because the 'instantaneity of ubiquity results in the atopia of a singular interface … speed distance obliterates the notion of physical dimension' (Virilio 1997b, page 385). Virilio offers a strong sense of how telecommunications allows the general confusion and intermingling of places, that in a dystopian vein rather undermines their existence – where commercial utopias look to their transcendence.

> 'The cathode-ray window brings to each viewer the light of another day and the presence of the antipodal place. If space is that which keeps everything from occupying the same place, this abrupt confinement brings everything precisely to that "place", that location that has no location. The exhaustion of the physical, or natural relief and of temporal distances telescopes all localization and all position.' (Virilio 1997: 385, cited in Leach 1999, page 75)

Instead then of mobilising more people for movement, which was the story of the industrial age from commuting through to tourism, the people in the age of global instantaneity are stationary and places are mobilised (Virilio 2000; Vannini 2002).

## Division

It is worth highlighting at this point that the informational environment is uneven between all scales from countries, to regions and cities, and within each scale. Castells' work points to the production of 'coccooned' and privileged enclaves, and the bypassing of some places. His vision stresses the abilities of ICTs to enhance the spatial reach and organisational power of users, to enable them to obtain preferential outcomes. This indicates the emergence of what (Castells 1989) has called the 'dual city', or Boyer (Boyer 1996) calls the min-max divergence, where the

city is sharply divided between prosperous 'knowledge workers' and those incapable of finding a place in the 'new economy' (other than, ironically, in servicing the needs for baby-sitting, house cleaning and similar such as servants of the 'knowledge workers' who require assistance to pursue their high powered lives). This evacuation of public space serves to reduce the urban experience to a mediated 'visibility without any face-to-face encounter in which the vis-à-vis of the ancient streets disappears and is erased' (Virilio 1997b, page 382). The 'dual city' is simultaneously 'globally connected and locally disconnected' (Castells 1996, page 404). Some are plugged in to global distantiated interactions; others are cut off into a local worlds where, if anything, events are slowed down. For example, while the connected are able to pay their bills online, access international communications and media, others find physical facilities closed and more poorly serviced making daily activities slower and more time consuming. A society split by speed where 'one part lives in electrical, world of relative speed – transportation --, the second with absolute speed of transmission of information in real time' (Virilio 1998, page 185). Processes of social polarisation can clearly be enhanced by the unbundling of 'public' services, permitting preferential access, and electronic service provision allowing the bypassing of urban contact and all the chance encounters of the city (Graham and Marvin 2002). This produces 'a society of cocoons ... where people hide away at home, linked into communication networks' that allow, and increasingly compel, a frenetic globally connected lifestyle, but where people increasingly opt out of the rest of the city through a 'spatial closure' (Burrows 1997, page 38) or 'pacifying space' (Robins and Webster 1999) in what Castells sees as the production of real virtuality in controlled non-places suggests a derealisation of the city and its replacement with 'semantically empty' and generic places (Wakabayashi 2002).

## Disintegration

Put together, these two readings of ICT-mediated urban change tend to suggest a process of disintegration as functional and social interactions are strung out over space and knitted together through real-time, distanciated, interaction. Here we find the oft and long heralded end of the city, the region or the state as a coherent social or political construct (at least as we know it). Thus even architects now declare that:

> 'It's finally flatlining. The city – as understood by urban theorists from Plato and Aristotle to Lewis Mumford and Jane Jacobs – can no longer hang together and

> function as it could in earlier times. It's due to bits; they've done it in. Traditional urban patterns cannot coexist with cyberspace. But long live the new, network-mediated metropolis of the digital electronic era' (Mitchell 1999, page 3)

From Marshall McLuhan people have been heralding the possibility of new bucolic existence where the city is replaced by dispersed village life linked electronically. This, then, is indeed Webber's model of propinquity without proximity which, for the traditional, romantic urbanite posture of so many academics, offers a 'chilling visions of urban dissolution into endless undifferentiated suburbia' (Mitchell 1999, page 75) or 'urban constellations' 'scattered through huge territorial expanses' binding together urbanised villages and cities (Castells 2002, page 549). These visions thus speak to notions of spatial extension that dissolve previously territorial entities through such effects as the permeation of diasporic connections sustained via media (Elkins 1997; Poster 1998), even prosaically via cheap international calls (Vertovec 2004) or indeed the confusions of governance based on spatial scale by networks that relate promiscuously across those territorial entities (Barwell and Bowles 2000; Nguyen and Alexander 1996) and the proliferation of non-governmental actors able to relate directly to each other (Breslow 1997).

However, ICT-based locational flexibility is not the same as locational indifference (Mitchell 1999, page 75). Nor is it clear that mediated contact is replacing copresence – the pattern is more complicated in what we might call an economy of presence. For a start, it is clear that many activities are not dispersing and indeed many of the new media producers themselves seem most dependent upon urban clustering (Pratt 2002; Gorman 2002). So rather than a simple dispersal of activities, optimists like Mitchell (1999) see possibilities for revivifying neighbourhoods, which no longer need to be locationally advantageous for work but might be locational good socially for relatively footloose workers to want to live there. Rather than the fantasy of working from isolated telecottages in the mountains, what may occur is the revivifying of those dormitory neighbourhoods deemed to have high amenity or environmental utility by mobile information workers. A delocalisation of work might thus result in 'urban tissues … characterized by live/work dwellings, twenty four-hour neighbourhoods, loose-knit, far-flung configurations of electronically mediated meeting places' (Mitchell 1999, page 7). This is then a densely patterned and contested geography, if an unfamiliar one:

> 'Ubiquitous interconnection does not mean the end of controllable territory or the elimination of the distinction between public and private turf, but it does force us to rethink and reinvent these essential constructs in a new context. The emerging system of boundaries and control points in cyberspace is less visible than the familiar frontiers, walls, gates, and doorways of the physical world, but it is no less real and politically potent.' (Mitchell 1999, pages 28-9)

The effect of this might be uneven and fractious. For instance Scott Lash draws up a heuristic division of the 'live and dead zones' of cities referring to 'the presence (or relative absence) of the flows' of information (Lash 2002, pages 28-9). This divide he pairs with responses to such information, referring to 'tame' and 'wild' zones. This produces a quick four way typology. Dead/tame zones are characterized by majoritarian ethnic groups clinging to traditionalist values in the face of change. Live/tame zones are characterised by the 'informational bourgeoisie', with affluent connected populations doing comfortably and thus relatively conservative as regards the social order. Live/wild zones are characterized by the emergence of new cultural forms driven by globally hybridised post-industrial service sector. Dead/Wild zones are areas of social decomposition, marked by marginal groups cultural change and fluidity. This, then, suggests not just uneven informational landscapes but how varying neighbourhoods and the informational environment interact.

However, Lash's typology is freighted with valorizations that privilege the 'wild' and unhomely over order. Even the have-nots in the 'wild' zones are exciting, while the cultural creatives drive innovative urbanism. This loading of the dice, especially for the live/wild, suggests we have something of a fashioning of a self-image or, at least, fantasy identity for information professionals:

> 'This leads me to voice an uneasy suspicion that many commentators, from academe, business, politics and media, in effect write themselves on to the city today. That is, much of the writing of the 'new urbanism', about the city's dynamism, its flexibility, its stimulation, is diversity, its computer communications technologies, its style, its cosmopolitanism, its cultures, seems to be, well, our story. We are indisputably part of the knowledge élite, and we tell our own favoured tale as regards the city of the future.' (Webster 2001, page 42)

So we need some care in accounts where dystopia and utopia often flip over the one into the other and where there is a little too much celebration of fluidity at times.

Bringing these three processes together, then, we can find the trend encapsulated by the concerns expressed by Escobar about the effects on the digitally marginal and daily life:

> 'The 'globalization of the present' reduces the ability of local time to make history and geography. The split between place and time (the age old localization of the hic et nunc) is consummated as real-time events detach themselves from the place where they are happening. The borders of the near and distant become blurred, transforming our sense of the here and now. Embodied, grounded, rooted action loses a great deal of its social importance. Teletopia induces a generalized atopia. Places become newly precarious.' (Escobar 1999, page 36)

What all these analyses articulate powerfully -- however we may argue with their deterministic readings -- is the potential and scale of ongoing changes. They also resonate with sets of widely held social hopes and fears. However, all such work faces a stark and fundamental limitation because of its invocation of deep conceptual architectures invoking a binarised split between the mediated, delocalised and 'virtual' domain of ICT-based interactions, and a 'real', material domain of the corporeal, local city. Rather we need to attend to the multiple possibilities such as the production of new centralities and new material entities through virtual actions, and the dependence of virtual realms upon material accumulations of technologies, actors and resources. Transnational flows are deeply embedded in ways that mean that many 'urban residents begin to experience the 'local' as a type of microenvironment with global span' (Sassen 2006, page 23). The relationship and effect on place of accelerated mobile information is thus dialectical. As Sassen puts it:

> 'much of what is liquefied and circulates in digital networks and is marked by hypermobility, actually remains physical – and hence possibly urban – in some of its components. At the same time, however, that which remains physical has been transformed by the fact that that is represented by highly liquid instruments that can circulate in global markets' (Sassen 2006, page 24)

**Producing centrality**

One dynamic that has become the focus of much concern is that if these spaces of media flows are uneven, with sites of high density and sparsity, and thus peripherality, then the production, and capturing of centrality in these new and apparently unruly networks becomes a key policy goal. Their fluidity provides an opportunity to gain advantage, or a risk of losing it, and cities in particular noted that globalisation did not just mean the dispersal of activities but actually a new geography of key hubs and switching points in global information flows (Castells 1989; 1996; 2002) since the 'dispersal of activities without losing coordination has gone hand in hand with massive concentration of resources for command and control embedded in specific milieu' (Sassen 2001, page 412). ICTs 'have not eliminated the importance of massive concentrations of material resources but have, rather, reconfigured the relations of capital fixity and hypermobility. The complex management of this interaction has given some cities a global competitive advantage' (page 411). These are the so called world cities or key hubs of a global network of cities or better cutting across and between key cities.

Global flows offer new patterns of connectivity and centrality based on key urban hubs whose strategic geography 'fluidly traverses borders and spaces while installing itself in key cities. It is a geography that explodes conventional notions of context and traditional hierarchies of scale' (Sassen 2000b, page 225). Instead of scalar hierarchies (neighbourhood to city to region to nation to global) as mediating containers there is a complex pattern of connection and collision between differently scaled activities:

> 'What is the "context", the local, here? The new networked subeconomy occupies a strategic geography, partly deterritorialized, that cuts across borders and connects a variety of points on the globe. It occupies only a fraction of it "local" setting; its

> boundaries are not those of the city in which it is partly located or those of the neighbourhood. ... The local becomes one mode in a complex interaction. I see a re-scaling: the old spatial hierarchy local-regional-international no longer holds. Integration is no longer achieved by going to the next scale in terms of size. The local now transects directly with the global. The global installs itself in locals, and the global is constituted through a multiplicity of locals.' (Sassen 1999, page 119)

New urban networks are directly globalised cutting across national lines (cf. Bunnell 2002a for a sceptical critique of this). Globalisation is not 'out there', nor is it all consuming but rather it is a partial condition – and the global, local and national are not discrete conditions that exclude each other (Sassen 2000b, page 215). Global networks weave in and out of physical spaces so that, rather than states relying upon territorial governance, things like technical standards become instruments of public policy, and complex patterns of firewalls, private networks, and different capacity networks produce a new uneven digital terrain (Sassen 2000a).

My purpose here is not to debate specific criteria of 'world city-ness', or how one might measure their role, nor to debate their importance, nor their relationships with nation states so much as trace the *effect* of the message that the current globalised world economy is coordinated through a network of urban sites whose functions have been globally recombined and developed. Urban leaders saw the message that a new global geography of key centres was forming as offering two policy lessons and imperatives. First, this new global formation appeared malleable and contestable with no preordained order about what cities might perform what role. Second, the capacity for global control must be actively produced (Sassen 1997, page 4). Institutional actors saw the potential and the imperative to develop world cities, and are producing discourses and economic practices that are reflexively framed through this understanding. The discourse about needing to be a hub in an informational network helps produce that very network. So rather than

informational capitalism being a given, it is an ongoing achievement that in so far as it exists is 'sustained and attended to—not least by the "capitalocentric" business discourses that propose the existence of a coherent global economy' (Doel and Hubbard 2002, page 355).

As Hubbard and Doel suggest world cities are not plugged into a network but rather produce that network. The emergent qualities of world cities are based on creating heterogeneous assemblages of people and places within themselves via reterritorialisations and recombinations where the city is created through relations between diverse actors operating at different scales and who intersect differentially with the traditional territorially defined city. There is no single 'solid object known as the global city... only an endless interplay of differently articulated transnational networks and practices' (Yeoh and Chang 2001, page 1026). So in this context I wan to turn to one case study that of Singapore, the city state that has made a virtue of being a small island in the flows of global seas to trace through some of these different imaginaries and issues.

**Singapore: exemplary space of recombinant spatial relations.**

One effect then of the reconfiguration of connections away from scaled links to direct ties between sub-systems is the recombination of cities into 'an "archipelago of cities" [or] more precisely, sub-ensembles of big cities, connected by telematic means and a great diversity of communication media. [Where one] might say that the world-city of contemporary capitalism has been deterritorialized, that its various components have been scattered over the surface of a multipolar urban rhizome' (Guattari 1992, page 124). For Singapore then this has meant collaboration and control beyond its borders, through a semi-denationalized 'growth triangle',

forming a 'transnational territoriality of an interlaced assemblage of border zones' between Singapore and parts of Malaysia and Indonesia (Bunnell, Muzaini, and Sidaway 2006, page 6). The overall plan for this zone promotes mutual 'coopetition' with the pooling of resources, with land and comparatively cheap labour in Malaysia and Indonesia, while Singapore provides infrastructure and managerial labour (Tran 2001, pages 218-9). The whole mobilizes a discursive imaginary of regional and non-national boosterism through 'complementarity' (Sparke et al. 2004). Although the empirical effects are debatable, it stretched and twisted borders to produce a 'global' economic space, whereby Indonesian labour would be connected to global markets via Singaporean capital and technology. Singapore expanded beyond its physical limits, with the free trade enclave in Bintan (Indonesia) having Singaporean phone numbers -- routing local calls to the island state, while a call to the surrounding towns became 'international'.

The recombination or 'virtualisation' of the city is partly the expansion of urban functions that 'engenders economic space through networking and alliances' to master flows and activities beyond its borders (Low 2001, page 416). Conversely this also entails controlling and embedding some flows – making the city a 'sticky place' amid the global flows (Markusen 1996). Sassen (2001) distinguishes the relative 'stickiness' of two sorts of information in the global economy: data which can be reduced to transmissible forms, and evaluative knowledge that requires high skill interactive processing, supported by networks of tacit competences. Firms seek cities whose social affordances enable the latter interactivity and that then allow the maximization of benefits from the former technical connectivity (2001, page 412-3). This social interactivity is bolstered by the actions of those very firms that strategically post staff to these locations in order to capitalize on contacts and knowledge – where for instance a posting to Singapore is now part of developing staff 'social capital' for many global firms (Beaverstock 2002; Beaverstock and Boardwell 2000). Such contacts though may well be based not on virtual flows but on enclavic

social spaces and face-to-face interactions outside the work place as well as inside it (Chang 1995).

FIGURE 2 Around here

Attracting and embedding these flows of people highlights that the mobility of populations, alongside products and information is crucial, with transnational communities being both vehicle and product of globalization. For an old entrepôt trade centre like Singapore, once known as the 'Clapham junction of the East', this is in many ways a familiar role, and the state could mobilise long standing imaginaries of the island as 'a space of flows, [with a] vision for Singapore [that] involves criss-crossing circulatory streams of people moving in multiple directions' with expatriate 'talent' complementing ICT development as 'major strategies to position Singapore as a significant node in the global space of flows' (Yeoh and Chang 2001, page 1029). This vision calls upon transnational flows of people from global elite workers, to tourists to poorly paid migrant labour brought in to service the domestic needs of these elites and infrastructural industries. In terms of who 'inhabits' Singapore, its users exceed its citizens – with nearly 20% of the population as resident foreigners and tourists exceeding the population *in toto* – making a city out of dispersed populations (Martinotti 1999).

In response, a strategy for a 'globally excellent city for the arts' has aimed to provide an attractive environment for elite workers (Chang, Huang, and Savage 2004) and create a 'renaissance city that serves global (economic) and local (socio-cultural) goals, attracting foreign talent to live there, tourists to visit, while at the same time retaining local residents and high quality way of life' (Chang 2000a, page 820) while fostering a 'little Bohemia' of liberal globalised values. The flip

side, as in many world cities, is hiding the army of domestic workers providing support to elites, coupled with social panics when this hidden support becomes visible in public spaces and disrupts assumptions of who has rights to the city (Yeoh, Huang, and Willis 2000; Yeoh and Huang 1999). However, in the midst of these pressures the Singaporean state has produced a space that is culturally, at least in terms of identity politics, quiescent – a live/tame zone of informational bourgeoisie in Lash's terms. Many cities trade upon delocalised, cosmopolitan heritages to produce cultural diversity, but in Singapore the drive to create a unified national sentiment, and suppress ethnicity based political mobilisation, has meant that, as Rem Koolhaas sardonically notes: 'Singapore seems a melting pot that produces blandness and sterility from the most promising ingredients'(1995, page 1017). What is left is the appearance of cultural diversity (Chang 2000b).

My focus here though is on the ICT initiatives through which the state has attempted to produce a new form of globality linked to transnational information flows. The state's proclaimed aim from the early 90s was to raise levels of IT literacy, computer usage and connectivity ahead of the rest of SE Asia making the city 'poised to become an electronically integrated metropolitan node in the global IT network' (Corey 1991, page 66). The goal of connectivity was accentuated with the announcement of the IT2000 strategy subtitled '*A Vision of an Intelligent Island*' (Chun 1997, pages 49-53; Corey 1993) according to then Prime Minister Goh, in 1999, it was key to 'going global' and delivering a 'first class economy in a first class city' which would bring Singapore into the 'information age' and make it a 'major hub city of the world' (Arun 1999, page 16). The creation of an 'Intelligent Island' would both entail and result from 'Catalysing the Digital Transformation', 'Branding Singapore as a Trusted Global "Dot.Com" Hub, 'Attracting Top Talents' and 'Fostering an E-Lifestyle' (Minister For Communications and Information Technology, Infocomm 21 Leadership Dialogue, 1 August 2000). Taken together, this is a

discursive formation mobilizing visions of progress in late modernity, national self-definition, globalization and technologised capitalism that legitimates political action (Lim 2001, 2002). This I suggest is a self conscious production of a world city, that local journalists even described as 'hubbing Singapore', whose discursive construction is bound into the apparently technical project of the 'wired city'. It does not report or represent technological developments but 'constitutes, incites and normalises this representation and idea of the Intelligent Island by promoting and endorsing a particular form of high technology urbanity' (Lim 2001: 180). As we shall see though it was soon realised that the IT2000 master plan, 'will bend, blur and buckle the parameters of space and time on the intelligent island. Life in the new cyberspace will be enveloped in a series of nested and overlapping spatial domains that include smart homes and buildings, virtual corporations, electronic marketplaces, IT townships and regional hinterland' (Chun 1997, page 59).

**From Island to Global Hub**

Singapore's spatial vision then is not of being a container or stock of resources, but of being a global hub where flows cross and intermingle (Crang 2003). The Government Economic Committee spelt out the aim to make Singapore a 'leading global city'. It aimed to 'Develop a Global Hub' because: 'Too small to rely on its own resources, Singapore has always plugged in to global networks. The Intelligent Island vision will help turn Singapore into a highly efficient switching centre for goods services, capital and information and people' (IT2000). It offers an almost direct echo of Castell's vision where 'the main nodes are not centres, but switchers, following a networking logic rather than a command logic, in their function *vis-à-vis* the overall

structure' (Castells 2000: 15 in Heiskala 2003). This vision then is powerfully externally oriented. According to its CEO,

> 'the Infocomm Development Authority of Singapore is positioning Singapore as a "Living Digital Hub" for emerging technologies. While Singapore will never be as big a market as China, India or the regional countries, Singapore has a fighting chance to be the most interesting location for companies to test if their new infocomm products, services or business concepts will work in a real-world environment. (Opening of 'eGarage', Ngee Ann Polytechnic, 26 February 2003)

This 'Living Digital Hub', that embeds 'e-living' (infocomm21) is legitimated and located by this global milieu. It is not intrinsic benefits but comparative position that is promoted, where through the creation of 'a leading infocomm-savvy society with a pervasive e-lifestyle [, b]y 2005, Singapore aims to be among the top five infocomm-savvy societies in the world' (Infocomm21). The global competition comes first before as an afterthought intrinsic benefits are mentioned the Assistant Chief Executive of the IDA, adding it 'has the potential to enhance the way Singaporeans play, learn, work and stay connected anytime, anywhere'. The documents are sparse on what an 'e-lifestyle' actually is, or what 'connected homes' entail. The points of reference for policy discourse are about defining an attractive locale in which key global actors will locate, not about the intrinsic benefits of the technology:

> 'As a country, we must also effectively address the challenges of the New Economy. Our vision is to position Singapore as a trusted global hub in the Internet economy, one in which e-commerce plays a dominant role in business and consumer transactions.' (Minister For Communcations And Information Technology, Infocomm 21 Leadership Dialogue, 1 August 2000)

The policy discourse repeats and restages an understanding of the global economy as comprising

a network of nodes and hubs, of which Singapore could be one.

As Jessop and Sum note, this move from being a space in itself to a space for itself in the global economy 'typically requires a degree of (self-)reflexivity that is absent in weakly competitive entrepreneurial cities and/or those that merely engage in boosterism or city marketing' (Jessop and Sum 2000, page 2292). The Singaporean state is reflexive about its economic policy and the aim here is explicit in its reading of intercity competition, where the island has been casting anxious comparative glances around the region.

> 'Competition is global. The lead in IT and telecommunications that Singapore now holds in the region can be easily eroded. A number of Asian countries have plans for national IT development that are far grander than IT2000. If Singapore is to retain its leading edge, Singaporeans will have to 'think global, act local', move at 'Internet speed' and compress 'time-to-market'.(Infocomm21)

The 1990s saw a heightened sense of urban competition in East and South-East Asia with cities developing new spaces as vehicles in entrepreneurial strategies, with the launch of the multi-media supercorridor in Malaysia (Bunnell 2002b; Lepawsky 2005) which was set up with many of the same goals and explicitly to challenge the pre-eminence of Singapore in informational matters, while Hong Kong equally purposively developed a 'teleport' to recast that city as the informational hub for Asia in what became a 'siliconised' competition (Jessop and Sum 2000, pages 2306-10). Although sceptical accounts question whether impacts on the ground were as great as claimed (Huff 2002), Singapore especially was locked in a bitter rivalry with Hong Kong (Townsend 2001) to become the south-east Asian hub – singular. Singapore reprised the colonial entrepôt legacy to proffer 'A Global City at Asia's Crossroad' or in a more technological variant inviting firms to 'Connect to Asia through the Singapore Digital Exchange' (DX) which:

> 'aims to position Singapore as the global distribution hub and trading centre for the processing, management and distribution of digital assets…. [The] DX initiative will create a new source of growth and extends Singapore's hub status in the digital realm' (Singapore Digital Exchange 2005 IDA page 1)

This crossroads is both metaphorically and materially constructed and any centrality or position in the flows has been actively manufactured. The historical overcoding and naturalised geographical referents are chimeras. But like all metaphors they are doing work – positioning Singapore in cognitive maps.

**The Limits to Globality: Re-Bounding spaces**

Meanwhile, there has been an ongoing and ambiguous positioning of Singapore regarding the plurality of information flows. The Singaporean state has continued with its longstanding policies of intervening and censoring in media outlets. Policy critics, such as the Far East Economic Review, the Herald Tribune have been banned, while magazines like Cosmopolitan were curtailed for their socially permissive content. My purpose is not to rehearse the full saga of this politics of media control but to highlight some specific tensions produced by the state's own rhetoric of informational globalisation. I wish to highlight three elements here; regulation of access to the global Internet, the local production of civil society and the fostering of creativity and openness ( a live/wild space in lash's typology).

The most rehearsed issue has been the state's actions with regard to censoring or limiting access to global information. Having on the one hand announced that global flows are inevitable,

unstoppable and an historic necessity to be embraced the state has had to face the uncomfortable application of this economic rhetoric to social realms. Its answer has been condemned as authoritarian, quixotic and praised as pragmatic. The first famous example came with a scan of all Singaporean email accounts in 1994 ostensibly for offensive imagery followed by outraged messages documenting traces of surveillance posted on alt.soc.singapore (Rodan 1998, page 77-8). The ensuing outcry, speedy backtracking and almost embarrassed scapegoating of bureaucrats, and the global stories confirming Singapore's authoritarian tendencies, make these seem the maladroit steps of a state grappling with a new informational landscape. However, if we look at the effects then the outcome is not so clear. The state had demonstrated its capacity to search email accounts, and it is by no means inconceivable that the postings fuelling the rumours of surveillance were deliberate. In other words the state had, despite the technical limits of surveilling huge volumes of data, created the impression that it could do so. Such intrusion did though risk upsetting the information industries Singapore was so assiduously courting. The action was followed by the announcement of limits to access to foreign web sites. The state forced all domestic providers to use a state run cache, which had a list of proscribed sites. Ministers were at pains to suggest, to Anglophone audiences and media, that this was a light touch regulation drawing  line in the sand – with but a hundred or so (undisclosed) sites forbidden (Lee 2005). The paradoxes in turning Singapore into a hub yet maintaining informational boundaries have long been apparent, as when William Gibson (1994) commented on the aim to be

> 'the Intelligent Island, a single giant data-node whose computational architecture is more than a match for their Swiss watch infrastructure. While there's no doubt that this is the current national project, one can't help but wonder how they plan to handle all that stuff without actually getting any of it on them?' [Since they plan] 'a coherent city of information, its architecture planned from the ground up. And they expect that whole

highways of data will flow into and through their city. Yet they also seem to expect that this won't affect them. And that baffles us, and perhaps it baffled the Singaporeans that it does.'

One response typical of the 'the distinctive "communitarian" ideology of the Singaporean political leadership' that ' has consistently espoused a need to promote social and community values through exercising control over what she believes is undesirable information' and wrestled with 'how the promise of information abundance is to be reconciled with the "communitarian" ideology' (Wong 1996, page 97) was the SingaporeONE National Information Infrastructure programme. Its acronym embodied the tension, since 'One Network for Everyone' neatly encapsulates the socially inclusive yet socially controlling nature of the state in Singapore. Everyone would be provided for, yet there would be no alternative. Local critics derided the plan as a 'virtual condom' designed to keep control of information both from without and within to create a 'government sponsored 'no-place' of a global hub' offering not Asian values but a hyper-western model of a frenetic working rationalised society, a 'Sweden-on-speed' collective (Thomas2Less 1999). However, Singapore has managed other such conflicts being, for instance, a major corporate satellite transmission centre, the regional base of 16 international broadcasters (Media21 report), yet at the same time not allowing satellite receivers – instead providing a multitude of cable TV channels through government controlled broadcasters.

However, after announcing its cache policy the state was rapidly forced to allow commercial traffic to bypass such an insecure data store. Moreover, it would be a fairly simple matter to dial-up a Malaysian service provider and bypass it that way. When it was suggested the limits were unenforceable, Ministers agreed, going so far as to say that given the levels of computer literacy they hoped most people would have the know-how to break through these barriers. It was intended as a signal, as Ministers positioned themselves as reasonable people, aware of the new

environment yet unwilling to simply throw in the towel, and they would often point to a conservative, 'heartland' of the island that would not want such capitulation either. The overall effect of having draconian penalties but announcing that you do not plan to use them, while demonstrating a capacity to monitor information is a not so liberal mixture. Remembering the panoptic principle is not continual surveillance, but the permanent possibility of surveillance we might see this as just such a model to encourage self-surveillance (Gomez 2002).

Many heralded the internet as opening a new democratising public sphere – though such ideas have come to seem more hopeful than likely outcomes. While Singapore has engaged fully with electronic delivery of government services under the rubric of 'efficiency', there has been far less encouragement of participatory democracy (Lee 2005). In the late 90s there was a flurry of young educated Singaporeans using the Internet – often having read the material on how it might open a new public sphere, partly through a wish to maintain contact as they did graduate work in the US. Initiatives such as Sintercom (Singapore Internet Community) and the Thinkcentre appeared and offered 'civil society' discussions, while the pseudonymously and US hosted Singapore Window offered a portal on non-approved versions of happenings in Singapore. They were careful not to say this was not politics but civil society, to escape regulation by the Political Societies Act. At times the distinction was threadbare, but equally it was tolerated, partly through a mellowing of Singaporean policies under Prime Minister Goh Chok Tong – keen to foster, or be seen to foster, a lively society and culture. Indeed various senior bureaucrats and those tied to the state and ruling party began to publicly discuss the rationale of censorship after 2000 which was remarkable in itself (Warschauer 2001). Alongside the relaxation of cinema, drama and entertainment restrictions Singapore was trying to foster creative thinking and also make the place more vibrant and attractive to key informational workers from around the world. Alongside, and in spite of, intolerance to homosexuality a variety of gay discussion groups,

generally hosted on US servers, sprang up to enable the local Singaporean gay scene (Ng 1999). But the level of discussion of social issues was rapidly swamped by a vision of virtual communities that were driven as commercially oriented shared interest groups – focused around types of products in a very commercialised web2 environment. The brief prominence of socially engaged discussion faded rapidly as the Internet went mainstream.

Indeed it is not implausible to connect the flowering with the zoned tolerance the state used for the arts. It allowed more controversial films for instance in the city centre venues frequented by younger, more educated more foreign influenced consumers. On the Internet, the youthful aspirations of talented, educated foreign connected innovators too were tolerated in a way the same opinions would not have been in the mass media of the time. This suggests that the state brought all of this back together not by acceding to a questionable technical logic of the Internet as uncontrollable, but instead through an economic rationale linked to its thinking of global positioning. That is it saw a functional necessity in fostering creativity and diversity both among locals, to develop their opportunities in the new informational sectors, but also about making the city a more vibrant and appealing local for globally mobile labour. The playwright Haresh Sharma sharply observed that 'The government may not be more liberal. But it sees the positive effects of being seen to liberalize'. In its own words this was a strategy which invested in 'heartware'.

**Conclusions:**

This paper has tried to demonstrate through the case of Singapore that the notion of dispersal or spatial annihilation is not quite the end of the story. There is also the active production of new centralities, alongside new assemblages and connectivities. Thus Singapore producing itself as a

'hub' via a discourse bound into a technological language about the necessities of globalisation that successively black boxes what globality might mean or actually entail. The global I have tried to suggest is not simply out there but is being conjured into being. As Koolhass perceptively remarked Singapore  is not an exoticised 'empire of signs' but and 'empire of semantics' that makes things happen not that encodes what is already there (Koolhaas and Mau 1995, page 1037). Clearly multiple rhythms and flows of different peoples play their role here. So too does differential connection. Singapore has expanded its control beyond its borders into surrounding territory building a virtual state, it has pulled in foreign flows of workers at varying levels to enhance its own capacities, and has sought to foster a specific informational milieu. In that sense we might see it as achieving an informationally live but tame environment, in something like a s pace of real virtuality for corporate capital, and is now seeking to offer the promise of more wildness.

In all this then I have tried to suggest that thinking of this through scales of neighbourhood, city, region, state and globe is to misconstrue how something like an expatriate enclave is global and local, how 'heartlanders' in global city might reject cosmopolitanism and how a state might come to accommodations that articulate different parts of a global system operating together. In Singapore's case it has succeeded, by and large, in its own terms, in connecting different economic, social, political and cultural processes occurring with different spatialities through the fabric of the city. So that truly it offers home@Singapore.world – not a nesting of scalar identities but morphing together of different ways of being, so that each forms a partial and parallel experience of life in the city.

Figure 1

Yahoo! Sponsored Bus below National Day parade slogan, Singapore 2000

Figure 2

Recruitment Advert for Singapore, Bristol University Alumni Magazine 2005. The advert reflexively uses both senses of information through creative interaction and socialisation and data transmission.

References


Arun, M. 1999. Smart Cities: the Singapore Case. *Cities* 16 (1):13-8.

Barwell, G., and K. Bowles. 2000. Border Crossings: The Internet and the islocation of citizenship. In *Cybercultures*, ed. D. Bell, 702-11. London: Routledge.

Beaverstock, J. 2002. Transnational elites in global cities: British expatriates in Singapore's financial district. *Geoforum* 33 (4):525-38.

Beaverstock, J., and J. Boardwell. 2000. Negotiating globalization, transnational corporations and global city financial centres in transient migration studies. *Applied Geography* 20:277–304.

Boyer, M. C. 1996. *Cybercities: visual perception in the age of electronic communication*. NY: Princeton Architectural Press.

Breslow, H. 1997. Civil Society, Political Economy, And the Internet. In *Virtual Culture: Identity and Communication in Cybersociety*, ed. S. Jones, 236-57. London: Sage.

Bunnell, T. 2002a. Cities for nations? Examining the city–nation–state relation in Information Age Malaysia. *International Journal of Urban and Regional Research* 26 (2):284-298.

———. 2002b. Multimedia utopia? A geographical critique of high-tech development in Malaysia's multimedia super corridor. *Antipode* 34 (2):265-295.

Bunnell, T., H. Muzaini, and J. Sidaway. 2006. Global City Frontiers: Singapore's Hinterland and the Contested Socio-Political Geographies of Bintan, Indonesia. *International Journal of Urban and Regional Research* 30 (1):3-22.

Burrows, R. 1997. Virtual Culture, urban social polarisation and social science fiction. In *The Governance of Cyberspace*, ed. B. Loader, 38-45. London: Routledge.

Castells, M. 1989. *The Informational City*. Oxford: Blackwells.

———. 1996. *The Rise of the Network Society: Networks and Identity*. 3 vols. Vol. 2. Oxford: Blackwells.

———. 2000. Grassrooting the Space of Flows. In *Cities in the Telecommunications Age: the fracturing of geographies*, eds. J. Wheeler, Y. Aoyama and B. Warf, 18-27. London: Routledge.

———. 2002. Local and Global: Cities in the Network Society. *Tijdschrift voor Economische en Sociale Geografie* 93 (5):548-558.

Chang, T. C. 1995. The 'Expatriatisation' of Holland Village. In *Portraits of Places: History, Community and Identity in Singapore*, eds. B. Yeoh and L. Kong, 140-57. Singapore: Times Editions.

———. 2000a. Renaissance Revisited: Singapore as a 'Global City for the Arts'. *International Journal of Urban and Regional Research* 24 (4):818-831.

———. 2000b. Theming Cities, Taming Places: Insights from Singapore. *Geografiska Annaler B* (1):35-54.

Chang, T. C., S. Huang, and V. R. Savage. 2004. On the Waterfront:Globalization and Urbanization in Singapore. *Urban Geography* 25 (5):413–436.

Chun, W. C. 1997. IT2000: Singapore's Vision of an Intelligent Island. In *Intelligent environments : spatial aspects of the information revolution*, ed. P. Droege, 49-65. Oxford: Elsevier.

Corey, K. 1991. The Role of Information Technology in the Planning and Development of Singapore. In *Collapsing Space and Time: Geographic Aspects of Communications and Information.*, eds. S. D. Brunn and T. R. Leinbach, 217-231. London: HarperCollins Academic.

———. 1993. Using Telecommunications and Information Technology in Planning an Information Age Singapore. In *Corporate networks, international telecommunications and interdependence : perspectives from geography and information systems*, eds. H. Bakis, R. Abler and E. M. Roche, 49-76. London: Belhaven Press.

Crang, M. 2000a. Public Space, Urban Space and Electronic Space: Would the real city please stand up? *Urban Studies* 37 (2):301-317.

———. 2000b. Urban Morphology and the Shape of the Transmissable City. *City: analysis of urban trends, culture, theory, policy, action* 4 (3):303-15.
———. 2003. Singapore as an Informational Hub in a Space of Global Flows. *DISP* 154 (3):52-57.
Doel, M., and P. Hubbard. 2002. Taking world cities literally: Marketing the city in a global space of flows. *City: analysis of urban trends, culture, theory, policy, action* 6 (3):351-68.
Elkins, D. J. 1997. Globalization telecommunication, and virtual ethnic communities. *International Political Science Review* 18 (2):139-152.
Escobar, E. 1999. Gender, Place & Networks: a Political Ecology of Cyberculture. In *Women@Cyberspace*, ed. W. Harcourt, 31-54. London: Zed Books.
Gibson, W. 1994. Disneyland with the Death Penalty. *Wired*.
Gomez, J. 2002. *Internet politics : surveillance and intimidation in Singapore*. Singapore: Think Centre.
Gorman, S. P. 2002. Where are the Web factories: The urban bias of e–business location. *Tijdschrift voor Economische en Sociale Geografie* 93 (5):522-536.
Graham, S. 1998. The end of geography or the explosion of place? Conceptualizing space, place and information technology. *Progress in Human Geography* 22 (2):165-185.
Graham, S., and S. Marvin. 2002. *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition*. London: Routledge.
Guattari, F. 1992. Space and Corporeity: Nomads, City Drawings. In *Architecture*, ed. H. Zeitlan, 118-25. Paris: Semiotexte.
Heiskala, R. 2003. Informational revolution, the net and cultural identity. *European Journal of Cultural Studies* 6 (2):233-45.
Huff, T. 2002. Malaysia's Multimedia Super Corridor and Its First Crisis of Confidence. *Asian Journal of Social Science* 30 (2):248-70.
Jessop, B., and N.-L. Sum. 2000. An Entrepreneurial City in Action: Hong Kong's Emerging Strategies in and for (Inter)Urban Competition. *Urban Studies* 37 (12):2287– 2313.
Koolhaas, R., and B. Mau. 1995. *S, M, L, XL*. Rotterdam/NY: 010Publishers/Monacelli Press.
Lash, S. 2002. *Critique of Information*. London: Sage.
Leach, N. 1999. Virilio & Architecture. *Theory, Culture & Society* 16 (5-6):71-94.
Lee, T. 2005. Internet Control and Auto-regulation in Singapore. *Surveillance & Society* 3 (1):74-95.
Lepawsky, J. 2005. Stories of space and subjectivity in planning the Multimedia Super Corridor. *Geoforum* 36 (6):705-19.
Lim, A. 2001. Intelligent Island Discourse: Singapore's Discursive Negotiation with Technology. *Bulletin of Science, Technology & Society* 21 (3):175-92.
———. 2002. The Culture of Technology in Singapore. *Asian Journal of Social Science* 30 (2):271-86.
Little, S. 2000. Networks and Neighbourhoods: Household, Community and Sovereignty in the Global Economy. *Urban Studies* 37 (10):1813-25.
Low, L. 2001. The Singaporean Developmental State in the New Economy and Polity. *The Pacific Review* 14 (3):411-41.
Markusen, A. 1996. Sticky places in slippery space: A typology of industrial districts. *Economic Geography* 72 (3):293-313.
Martinotti, G. 1999. A City for Whom? Transients and Public Life in the Second-Generation Metropolis. In *The Urban Moment: cosmopolitan essays on the late-20th-century city*, eds. R. Beauregard and S. Body-Gendrot, 155-84. London: Sage.
Mitchell, W. 1999. *E-topia: "Urban Life, Jim but not as we know it."* Cambridge: MIT Press.
Ng, K. K. 1999. *The Rainbow Connection: the Internet and the Singapore Gay Community*. Singapore: KangCuBine Publishing.
Nguyen, D., and J. Alexander. 1996. The coming of cyberspacetime and the end of polity. In *Cultures of Internet: Virtual Spaces, Real Histories, Living Bodies*, ed. R. Shields, 99-125. London: Sage.
Novak, M. 1995. Transmitting Architecture: The TransPhysical City. *Ctheory: Theory, Technology and Culture* 19 (1-2):#34.

———. 2000. *transArchitectures, avatarchitectures: the Architecture of Augmentation* 1997 [cited 3/9 2000]. Available from http://www.archi.org/transarchitectures/t02_catalogue/ctap30.htm.
Poster, M. 1998. Virtual Ethnicity: Tribal Identity in an Age of Gloal Communications. In *Cybersociety 2.0: revisiting Computer-Mediated Communication and Community*, ed. S. Jones, 184-211. London: Sage.
Pratt, A. 2002. Hot Jobs in Cool Places. The Material Cultures of New media Product Spaces: the case of South of the Market, San Francisco. *Information, Communication and Society* 5 (1):27-50.
Robins, K., and F. Webster. 1999. *Times of the Technoculture: From information society to the virtual life*. London: Routledge.
Rodan, G. 1998. The Internet and Political Control in Singapore. *Political Science Quarterly* 113 (1):63-89.
Sassen, S. 1997. Electronic Space and Power. *Journal of Urban Technology* 4 (1):1-17.
———. 1999. Juxtaposed Temporalities: Producing a New Zone. In *Anytime*, ed. C. Davidson, 114-121. Cambridge, MA.: MIT Press.
———. 2000a. Digital Networks and the State: some governance questions. *Theory, Culture & Society* 17 (4):19-33.
———. 2000b. Spatialities and Temporalities of the Global: Elements for a Theorization. *Public Culture* 12 (1):215-32.
———. 2001. Impacts of Information Communication Technologies on Urban Economies and Politics. *International Journal of Urban and Regional Research* 25 (2):411-18.
———. 2006. Public Interventions: The Shifting Meaning of the Urban Condition. *Open* 11:18-27.
Smith, M. P. 2001. *Transnational Urbanism: locating globalization*. Oxford: Blackwell.
Sparke, M., J. Sidaway, T. Bunnell, and C. Grundy-Warr. 2004. Triangulating the borderless world: geographies of power in the Indonesia–Malaysia–Singapore Growth Triangle. *Transactions of the Institute of British Geographers* 29:485–498.
Thomas2Less. 1999. SingaporeONE. *Ctheory: Theory, Technology and Culture* 69.
Thrift, N. 2004. Driving in the City. *Theory, Culture & Society* 21 (4/5):41–59.
Townsend, A. M. 2001. Networked cities and the global structure of the Internet. *American Behavioral Scientist* 44 (10):1698-1717.
Tran, V. 2001. Coopetition. In *Harvard Design School Guide to Shopping*, ed. R. Koolhaas, 204-224. New York: Taschen.
Vannini, P. 2002. Waiting Dynamics: Bergson, Virilio, Deleuze, and the Experience of Global Times. *Journal of Mundane Behavior* 3 (2):193-208.
Vertovec, S. 2004. Cheap calls: the social glue of migrant transnationalism. *Global Networks* 4 (2):219-224.
Virilio, P. 1997a. *Open Sky*. London: Verso.
———. 1997b. The overexposed city. In *Rethinking Architecture: A Reader in Cultural Theory*, ed. N. Leach, 380-390. London: Routledge.
———. 1998. Architecture in the Age of its Virtual Disappearance. In *The Virtual Dimension: Architecture, Representation and Crash Culture*, ed. J. Beckmann, 178-87. New York: Princeton Architectural Press.
———. 2000. *Polar Inertia*. London: Sage.
Wakabayashi, M. 2002. Urban Space and Cyberspace: Urban Environment in the Age of Media and Information Technology. *International Journal of Japanese Sociology* 11:6-18.
Warschauer, M. 2001. Singapore's Dilemma: Control versus Autonomy in IT-Led Development. *The Information Society* 17 (4):305 - 311.
Webster, F. 2001. Re-inventing place: Birmingham as an information city? *City: analysis of urban trends, culture, theory, policy, action* 5 (1):27-46.
Wong, P.-K. 1996. Implementing the NII Vision: Singapore's Experiences and Future Challenges. *Information Infrastructure and Policy* 5 95-117.

Yeoh, B., and T. C. Chang. 2001. Globalising Singapore: debating Transnational Flows in the City. *Urban Studies* 38 (7):1025-44.
Yeoh, B., and S. Huang. 1999. Spaces at the margins: migrant domestic workers and the development of civil society in Singapore. *Environment and Planning A* 31 (7):1149 - 1167.
Yeoh, B., S. Huang, and K. Willis. 2000. Global cities, transnational flows and gender dimensions: the view from Singapore. *Tijdschrift voor Economische en Sociale Geografie* 91 (2):147-158.