





iPhone City



Is the iPhone and a whole new generation of mobiles and PDAs eclipsing the physical city? Whereas once the metropolis alone brought together people, markets, goods, transport and information, the iPhone and similar handheld devices are changing spatial interaction. From Los Angeles, **Benjamin H Bratton** ruminates on the full impact of this technological shift.



An experiment: one-half of all architects and urbanists in the entire world should, as of now, stop designing new buildings and new developments altogether. Instead they should invest the historical depth and intellectual nuance of their architectural imaginations into the design and programming of new software that provides for the better use of structures and systems we already have. It is a simple matter of good content management. The other half, the control group, may continue as before.

Sitting in traffic on a Los Angeles freeway, looking at my edits for this essay, I am reminded of Joan Didion's revelation that this is the most authentic Angeleno social experience. We are not going to any place, all lined up behind our windshields, we are all already there.¹ Today, bumper to bumper, we are now all also on our phones and PDAs: taking meetings, texting, emailing, Googling, checking on this and that, editing essays on our iPhones. This is the home and office. We do not always need to arrive, because we are already there: if this was your home, you would live here by now. This is a grid that segments and enables an inertial sort of mobility. Ensconced in our furtive provisional networks, the car is no longer the primary technology of mobility, even in LA. It has gone the way of the building. By the time Reyner Banham arrived, the car had eaten LA; now the phone is eating the car.

The 'mobile' began life as a 'car phone', but now the terms are reversed. In *The Transformers*,² the alien robot became a car, and the phone became a robot. Here now, the car becomes a phone. As mobility has transformed from mechanical to informational, the car is augmented by hands-free telephony, Bluetooth networks, in-dash GPS navigation systems offering visualised or spoken directions, iPod jacks, big screens counting down the drops of fuel while talking to you in weird accents, and emergency concierge communications by built-in satellite

intercom. The handset does all this too, steering us in different directions by maps, recommendations, search results, geotags and so forth. The phone and car find ways to subcontract each other's functions, one to the other and back again.

In ways that would have made no sense in Banham's LA, the car's interfaciality is an important criterion of performance as a personal vehicle. In addition to the slow move to alternative power, the clearest change to the car in the last five years is in the display electronics within its primary interface, the dashboard/cockpit. If the grille on the outside used to be the car's face – its look – now the face comes with the voice on the inside. That new primary, brandable experience interface does not focus on how a car looks in the world, but on how the world looks gazing out through the lens of the car. The car+phone hybrid is a mass medium, a mobile cinema+micro-urbanism for one driver/user, a habitat organised and narrated by data networks. But in the end, they are not equal; the handset is the ascendant vehicle, and the car is the architecture in slow disappearance.

Programming Gestures Programming Space

No one, today, can know what the city of tomorrow will be. One part of the semantic wealth which belonged to it in the past ... it will lose that, certainly ... The creative and formative role of the city will be taken charge of by other communications systems ... their vocabulary and syntax, consciously and deliberately.

Juliette, in Jean-Luc Godard's *Two or Three Things I Know About Her* (1967)³

How can we properly theorise the digital at the scale of the city, and the city rendered as digital media? First, it is not really about newness. Foundational, even primal conditions are now reanimated (layering effects, invisible information made visible, physical computation, collapsed distances, remote control, etc) that cannot be reduced to a new digital sheen on an old analogue world. I think of Sanford Kwinter's allegory of the digital Pleistocene.⁴ Humans, as a species,



have evolved little in the last hundred thousand years, and hardly at all since the appearance of writing. Our senses, our inherited built-in media, are the same as those that allowed us to survive the predatory rhythms of the primordial savannah; and in the city's very real landscape of information production and reception those same rhythms persist, in communication with our new media and augmented cognition. Architecture is at least partially tuned to these. The Modernist call for a more intense technologisation of the disciplinary *doxa*, blending urban and cybernetic programs, is a now permanent feature of the discourse.⁵ Any such programming of this perceptual space casts the digital city as a shared nervous system, and today the rupture of digital information networks through the membrane of the city into the open view of people and their mobile screens relies on the body's capacity to 'proprioceptively' map its own displacement in real and imagined geographies.⁶

Peter Sloterdijk's historical image of environmental embodiment, an irreducible, self-animating circuit of habit and habitat, pertains equally to the ambient informational fields that cloud the city and through which we learn to mediate spaces both near and far.⁷ But such spheres need to be learned and, while it takes time to master remote controls, let alone the control of remoteness, we are fast learners. There is a monkey at Duke University who, through interfacial electronics connected to his brain, controls a robotic arm miles away.⁸ His dispositional impulses become informational pulses which, properly mediated, effect a remote prosthesis to do his bidding. Like this monkey's, our own bodies are infused and intersected by the extensional networks of the living city, both controlling its machinery at a distance and triangulated socially and psychologically by that machinery in the course of our movements. We

learn to operate the city as a meta-interface, one comprised of many smaller tactical interfaces (just as we learned QWERTY, internalising the feedback of expression and inscription as a physical interface to the production of written language).

Substances at Hand

If the first function of the city is proximity (to people, markets, goods, transport, information), the smart digital handset condenses the city itself into an extensible software+hardware platform. Globally more people own mobile phones than regularly access the Web, and for most of the world their first computer will be a handheld one that is also a mobile phone. Computation will not arrive as a desk-bound or even lap-bound experience, but as an active network linking speech to data for ambulant gesturing bodies moving through active worlds.⁹ Phone+city is a composite read-write medium, allowing for real-time communication through multiple modes, now and in situ, and represents, in combination, an important infrastructure of any emergent global democratic society. It can do this not only because it enables physical, communicative and thereby social mobility, but because it dramatically reinserts specific location into digital space and does so by making location gestural.

The foremost infrastructural projects of our generation have been the planetary proliferation of digital information networks, and now another that moves that infrastructure from an embedded *sous-terrestrial* network to a pervasive in-hand circuit of body and information cloud. Computation evolves from a rare, expensive national asset to a cheap ubiquitous vapour. That stream's orifice is the handheld phone, PDA, homing beacon, Geiger counter, magic antenna, virtual goggles, scanning X-ray filter, field recording microphone and camera that makes hidden wisdom appear; the device becomes a window on to the hidden layers of data held in or about the user's immediate environment. Urban and network diagrams are images now animated in hand, transformed from maps into image-instruments with which to connect and control the immediate and remote environment. Both distance and nearness erode under the weight of the interface's imagery.¹⁰



The iPhone is the first to put it all together in a way that changes how a critical mass of consumers could envision a new genre of computing: interaction-in-the-wild. The impact of this as a new mode of spatial interaction has yet to be realised. The iPhone is not close to being the most popular mobile and is not likely to be any time soon. At the time of writing, Apple has sold about 13 million iPhones in total, whereas Nokia sells more than a million phones per day. Research in Motion's Blackberry has done far more to put the office desktop in workers' pockets. But the impact of the iPhone outweighs its comparative success as a product. Unlike its competitors, the iPhone does not feel like a desktop or phone experience, but instead something immediately recognisable as a personal interface to ambient information. The shift from point-and-click to multitouch gesturing represents a 'substantialisation' of data, a cognitive shift in the 'how' but also the 'what'. Compared to other devices it does not so much present icons that mimic other things and trigger 'virtual' events as it is embodied by tangible interfaces activating living information in the here and now. It shifts thinking from interfaces that arrange pictures of things to an interface full of actual data substances you can directly grab and manipulate.

The hardware itself makes this possible. Enclosed in sensate glass, the iPhone interface and hardware blend into what the user perceives as a single dynamic form or field. Framed in this way, 'apps' have their own 'thingness' that similar applications on other devices do not. Others have menus and contextual options but suggest no immediate tangibility. The iPhone graphical user interface (GUI) is filled with things not metaphors; it is a tactile movie shell to be pushed and pulled as real, rubbery stuff which seems illuminated from within, not as a layer but as an organic expression; it has 'faciality'. This tangibility and anthropomorphism are what makes it work, socially and psychologically, as an interface to the world directly, not to the network indirectly – to the real, not to the iconic.

The Turing City and the Protocols of Program¹¹

The city as seen through the medium of that face oozes with living data to be touched and rewritten all over again. Interaction with this information is recursive; action taken with it on a micro level is itself new information that in turn informs what everyone else sees on a macro level. In this recursion the presence of the information, good or bad, can be directly disruptive to social behaviour as people change their paths and decisions in the image of

the actions and swerves of others they see indexed in their at-hand interfaces. The graphical appearance of this interface, then, is less a figural representation than a direct urban event, part of bigger circuits of concrete movement. Thus for the architect, the digital city becomes a habitat, a sphere in Sloterdijk's sense, to the extent that it becomes the foundational layer of the designable software stack.

This portends to both radically complicate and simplify architectural and urban programming strategies. Architectural program and interfaces can reside in structure or furniture, fixed or unfixed.¹² The same is true for software and the Turing City, where program becomes less ordered and more entropic, always shuttling between mobile and immobile interfaces. 'Program' can be understood as modes of the social that require some supporting material culture to repeat themselves, and which were traditionally zoned within partitioned locations. Now as the work of that material is more available to the calculations of software, the program itself is as portable as the handset which, for one or many users, projects and transposes a program into a given locale at a given time. The principle: much of what we, as a society, used to ask of architecture in the functional organisation of people and organisations in space and time, we now ask of software. Is software, in-hand, less an augmentation of a situation than the physical environment as a layer of a software/hardware stacked network? In the case of the iPhone, program is less about geography and more about opportunity. As urban 'functions' are translated and transposed into applications, they can be activated alone or in groups at a moment's notice, providing a different interface to the same location and through this a specific urban program, one likely co-occupying that location with many others.

Locative media pose integrative design questions. Software program, architectural program (and political program) mix and merge in new ways. Architecture's programming expertise must participate wholeheartedly in this assignment, replicating, condensing, mobilising, diverging and converging the small and large interfaces that constitute the social. This is less the design of the network than of the computational mechanisms that formulate the nodal and edge conditions and the interfaces that provide the access to, or protection of, these. It is both meticulously mechanical and broadly dramaturgical, a systematising of the possibility of particular events appearing, both on schedule and off, and of the scenarios by which those events become residual social languages. It is a geo-computational program, but one that calculates conditions of appearance more than it scripts or contains what finally emerges. The design frameworks are protocols that ensure a predictable malleability of information flow. For example, the street grid is a protocol, a dumb fixed standard that allowed the modern city to emerge as a dynamic network. If it had been animate or idiosyncratic it would not mediate the maximal churn that it does. Taken to its radical logic, Archizoom's No-Stop City was a rendering of this modernity in its purified form – the city as an infinite protocol. In this, the integrative programming of inherited urban modernities

converges and competes with new protocols that afford the design of overlapping geographies and concurrent assemblages, protocols with names like Geo RSS, GML, GPX, KML, EXIF and Geo OpenSearch. An urban ecology of software continues to emerge and here the concern is not what the iPhone (or any product) per se will allow, but whether all and any allowable platforms will support the promiscuous multiplication of loquacious protocols.

As the channels of the city are compressed and revealed by the handset's interfaces, the gravity and contiguity of architectural programs dissolve. Use is always mixed. The Turing City requires a logic of program that is less like an OMA sectional diagram and more like the iPhone deck itself. The sectional stacking of many discrete zones of behaviour into a single envelope gives way to interior and exterior sites that can be activated in any number of different ways by different people using different software in-hand. The same is true of the urban scale. For the traditional urban zoning project, the rhythm of programmatic (social, behavioural) discontinuity is dense, but each is bound to its restricted zone in planimetric or sectional space. In the Turing City, 'zoning' becomes a more problematic technique. In the traditional sense, it becomes less enforceable, and even self-defeating, when a whole section of the city interacts differently with a user or group depending on what software they are running. Ten minutes later, a different software activates a different program, and in this architecture is to some extent relieved of the programmatic responsibility of functional instrumentality or even specific purpose. All these spatial logistics have been outsourced to much more liquid media.

Protocols are the grammar, but the architecture of the software stack is the real framing possibility of program for designers. On the go, this is really a GeoStack, a set of tools that create and use the data of the geographically intelligent Web, designing and tracing information from its point of creation through publication, sharing, aggregation and, finally, consumption. The stack's verticality is an arrangement of relationally open and closed channels of information production, manipulation and accessibility. Plumbing into plumbing. Through this, designers designate where to place their services, identify synergies and develop extensible systems that can enhance their particular offerings. The range of services and opportunities for savvy urbanists is vast: location-aware augmented reality viewfinders, macro-sensing and reality-mining of composite crowd-sourced behavioural





data, citizen activists using GIS and mass-market Geobrowsers and plugging open map layers into their Ruby and MySQL applications, real-time disease outbreak visualisation and real-time micro governance of biopolitical swarms, traffic control sensor and tollbooth hacks, individually reconfigurable interior partitions, collapsing rooms and even floors, proprietary parking applications, post-Twitter ones keeping us always at the tent-pole centre of our concentric and now minutely reflexive social network, bus bench RSS feeds, pigeons that blog, lifelong syncing of car-phone-home-clouds, in-pocket web servers, real-time traffic, congestion and crime data patterns informing personal routeware, point-and-scan barcode readers, 4.5-inch Bloomberg terminals, instant carbon-footprint visualisation, real-time voice-to-voice language translations, location-based serial cinema, Google Habitat, real-time cab spotting, personal arphid managers, data-privacy consulting services, grey-market concierges and so on, all posted with at least partially open application programming interfaces (APIs) enabling other applications to further build on the existing stacks.

A Small Onyx Frame of Immanence

It is said that at the end of the rainbow there is a pot of gold. Where that end is, however poses a problem, since it is different for every observer. The rainbow is actually a distorted virtual image of the sun.

Nevertheless, it looks like a real object. Could it be that similar distortions apply to other 'real' objects?

From Otto E Rossler and Peter Weibel, 'Endophysics of Our Rainbow World', 1992¹³

Regarding further briefing details for my future software assignment to the one-half of architects: any such development is fraught with risk, not only because of what it would leave behind but because of what it might accomplish and quickly lose ability to control. The experimental half turning its attention to the Turing City should consider the several conditions (or admonitions) below. First of all, this represents an activation of human-object networks in ways that are both new and primordial. Anticipate the rapid co-evolution of urban behaviour and urban software, such that the devices themselves and their capacities will appear to be evolving more in relation to each other than to us. This Darwinism of the device will make it seem as though we are their media and not the other way around. Appearances can be factual. In this the explosion of hyperlocal and hypervisual information will both amplify and multiply the intensities of social interaction, but will also reveal the complexity of communication between non-humans (animals, ecologies, infrastructures). Just as our collective urban cognition comes online it will be exposed as a hopelessly outflanked minority discourse. Quite clearly the computational intensification of the interface will make it more and more cinematic, and more affectively factual, effectively exacerbating everything we already know about the instability of cinematic memory, action, projection, repetition and pixellation, and bringing these deeper into everyday life.

The social-psychological results of all this will be complex and contradictory. Pervasive computing will make inanimate objects see, hear and comment on our interactions with them. This experience will, in many cases, be indistinguishable from a psychotic break, or from the affinity rituals of classical animism. In a recent interview, Paul Virilio notes that today's qualities of technology – instantaneity, ubiquity, immediacy – are those associated with the divine. The killer application of pervasive computing is not advertising to the hipster *flâneur*; it is religion, and its impact on Abrahamic monotheisms will be turbulent, existential and fertile. The iPhone City is post-secular.¹⁴ **D**



Notes

Thank you to Bruna Mori for her excellent edits.

1. Interview with Joan Didion in *Shotgun Freeway: Drives Through Lost LA*, documentary film by Morgan Neville and Harry Pallenberg, 1995.
2. *The Transformers*. Michael Bay. 143 min. USA release date 2 July 2007.
3. *2 ou 3 Choses que Je Sais d'Elle (Two or Three Things I Know About Her)*. Jean-Luc Godard. 85 min. France release date 17 March 1967.
4. Sanford Kwinter, 'Digital Pleistocene', Seminar description, SCI-Arc, Los Angeles, summer 2008. An excerpt: 'The contemporary "mediascape" has given such primacy of place to communication that it has transformed it into substance itself, the very material of which we, and our world, are made. Yet all biological substance is founded on signaling, from the first single-cell organisms nearly 3 billion years ago to the most sophisticated forms of human social life (MySpace?) today. There is no family of animal that is not defined by its capacities for signaling and no ecological niche that is not defined by the infrastructure that supports this signaling. When the human line broke off from its ape ancestors it was a result of a new capacity for communication (a new hand-eye-brain-mouth machine) and the rise of a new signaling niche in the environment to be filled (the long distance savannah).'
5. Throughout this essay, the US 'program' is used to indicate both architectural 'programme' (English spelling) as well as computational 'program'. It is precisely the promiscuous ambiguity between one and the other that the author wishes to convey. After the appearance of the computer but before the mobile phone, Reyner Banham called for a revolution in the technologisation of the environment, a complete folding of architectural and cybernetic programs/programmes. Reyner Banham, 'Architecture After 1960', *Architectural Review* 127, No 755, April 1960, pp 253–60. See also Anthony Vidler, 'Toward a Theory of Architectural Program', *October* 106, Fall 2003, pp 59–74.
6. See Brian Massumi, 'Sensing the Virtual, Building the Insensible', in *AD Hypersurface Architecture*, August 1998, pp 16–25.
7. Peter Sloterdijk, *Sphären Bde.1-3: Eine Trilogie: 3 Bände*, Suhrkamp (Frankfurt), 11 November 2008.
8. See <http://www.pratt.duke.edu/news/?id=753>. Accessed 15 November 2008.
9. By comparison, One Laptop Per Child (Nicholas Negroponte's attempt to distribute inexpensive, highly functional laptops designed for the needs of children in the developing world) cannot possibly keep pace

with the exponential multiplication of increasingly sophisticated handsets. Compare it with the reach of Nokia, the world's largest handset manufacturer and mobile software provider, selling 1.34 million devices per day. Nokia generally develops its own software for its own phones, but has a strong interest in the reality of pervasive computing as a global social platform. The work done by its researchers, such as Jan Chipchase, Younghee Jung, Adam Greenfield, Julian Bleecker and Rebecca Allen, attests to this investment. See <http://research.nokia.com/research>.

10. See Benjamin H Bratton and Natalie Jeremijenko, *Suspicious Images, Latent Interfaces*, Architectural League of New York, September 2008. This pamphlet also deals with information visualisation and ecological monitoring through these problematics. See <http://www.situatedtechnologies.net/?q=node/88>.

11. Perhaps a better name for the more general condition of urban cultures reconfigured around pervasive computing would draw on the figure of that great computational ontologist, Alan Turing.

12. A program of illumination can come from a window (architecture) or a lamp (furniture), sitting from a chair or a fold in the wall, cooling from a walk-in freezer or a refrigerator, and so on. The designation of which programs are fixed and which are unfixed, architecture or furniture, is always very open even if not normally appreciated as such.

13. Otto E Rossler and Peter Weibel, 'Endophysics of Our Rainbow World' in Karl Gerbel and Peter Weibel (eds), *The World from Within – ENDO & NANO*, Veritas-Verlag (Linz), 1992, pp 13–21. Also republished in Peter Weibel (ed), *Olafur Eliasson: Surroundings Surrounded – Essays on Space and Science*, MIT Press (Cambridge, MA), 2001, p 504.

14. The Mumbai terror attacks of November 2008 occurred four days after completion of the first draft of this essay, and the writing of these horrifically verified concluding remarks. In the days just following, we learned about the array of powerful but off-the-shelf navigation and communications software and hardware used by the attackers to coordinate their movements throughout multiple locations at once: satellite phones, handheld GPS, anonymised email, Google Earth, voice-to-text software, and so on. On 16 October 2008 the US army published a report considering scenarios in which terrorists would coordinate urban mobilisation using Twitter. See <http://www.fas.org/irp/eprint/mobile.pdf>. In Mumbai, Twitter was used by hostages and others to report and share information on the events in real time. The #Mumbai hash tag generated hundreds of pages of texts. See <http://twitter.com/Mumbai>.

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