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**'Imagine if our cities talked to us': Questions about the making of 'responsive' places and urban publics**
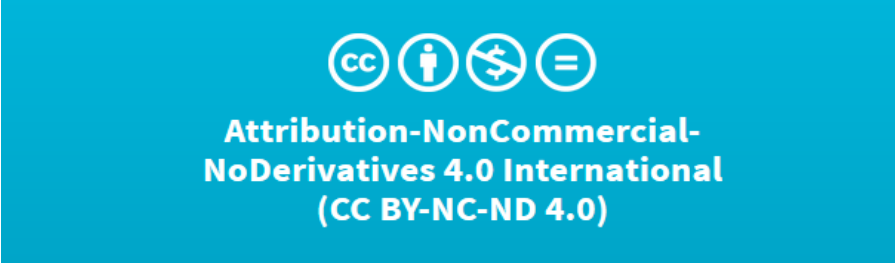Making Publics, Making Places, 2016 / Griffiths, M., Barbour, K. (ed./s), Ch.3, pp.27-48

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# 'Imagine if our cities talked to us': Questions about the making of 'responsive' places and urban publics

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*Mary Griffiths*

> The digital world is converging with the physical world, and this phenomenon, known as the Internet of Things, represents the next era of computing. It is one where just about anything can be connected, through sensors and data to other objects, environments, people and, of course, the Internet. (Altimeter Group 2015)

The range of technical, social, environmental and political issues raised by the possibility of 'just about anything' being invisibly connected is overwhelming in breadth, scale and depth. The seamlessness of the connectivity predicted is unprecedented in human history and there are as yet few convincing full-scale examples in connected buildings, or in consumer supply chains enabled by the Internet of Things [IoT], or in smart cities, to illustrate how it works in practice. Critical issues already identified include a controversial means of data collection, which makes new forms of urban planning and placemaking as a 'whole-of-city' enterprise possible; and related governmental techniques through which city populations (and specific publics) can be involved in designing their own governance. Yet initiatives exist

(some of which will be used to illustrate this chapter's arguments) which cast light on the ways that smart technologies are starting to shape everyday experiences of the material world, and generate new relations of power.

In this chapter, the making of places and publics is addressed through the prism offered by the nascent Internet of Things and locative technologies in the 'smart city'. The smart city can be defined as an urban digital infrastructure supporting, amongst other activities, technologically-enabled responsive environments. These spaces are governed by big data collected by various means, which allow 'the city' to talk back to its inhabitants by offering real time information and a range of choices designed to alter behaviour or encourage different relationships to place. The chapter aims firstly to identify the drivers of the rapid adoption of 'smartification' by cities and users, and then to canvass the democratic and participatory factors involved in implementing radical change, noting the risks which may occur in the rush to connect on such a global scale.

My argument is that the democratic governance of data which allows a city to 'talk' to its inhabitants requires the adoption of participatory, inclusive practices from those designing responsive places. As the big data collected represents a 'collective enterprise' (Ruppert 2015), the 'makers' of the urban space include all those from whom information is collected, those who extract it and analyse it, and those to whom it is returned, as well as the urban designers of the smart city. Speaking politically in Latour's sense of having no preconceptions about how things work (2003), but a sense of how they *could* serve populations democratically, I argue that a critical gap in awareness of, and ambitions for, the urban IoT may be emerging between, on the one hand, municipal governments and their technology partners and, on the other, the urban inhabitants whose everyday experiences are directly affected by smart design. Users are already being familiarised to the IoT by their experience of smart consumer products, and made subjects of the IoT in different contexts such as work and home. The provable accountability and success of 'responsive' urban placemaking, and even the inclusiveness of rights to the city for all, could be affected if planners do not engage with existing publics, or accurately reconceptualise the new publics made by 'smartification' processes. At this early stage of the IoT, smart city planning requires contextualisation and democratic scrutiny.

### Placemaking in cities

Placemaking has a civic, aesthetic and communitarian history which long precedes the arrival of digital technologies, emerging from urban planning, citizen activism and built practices. It is described as a 'crucial and deeply valued process for those who feel intimately connected to places in their lives', one which helps them 'to reimagine everyday spaces, and see anew the potential of parks, downtowns, waterfronts, plazas,

neighbourhood, streets, markets, campuses and public buildings' (Project for Public Spaces, n.d.). Placemaking as a practice generates the participatory publics who help shape traditions of mutuality, as well as feelings of neighbourhood belonging and community membership. Large-scale civic placemaking often has a recognisably aesthetic or public art component. The allusive poetic texts embedded into the surfaces of Federation Square in Melbourne, and the arts community's curation of the Victorian Arts Projects 'Testing Grounds' on City Road, Southbank, are Australian examples. Both shape participation by prompting mindfulness of civic issues beyond individuals' immediate experience of their physical surroundings.

Striking international examples of placemaking include botanist Patrick Blanc's creation of the vertical garden for museums in Paris, and on corporate buildings in downtown Sydney and Toronto (Blanc, n.d.). The spectator is encouraged to ponder the meanings generated by the exotic plant colonisation of spaces from Qantas lounges to concrete towers. These and art-based revivifications of urban 'dead spaces' attract mutable publics, an assembly of individuals with no prior attachment, hailed by an external prompt and, in the sense Warner (2002) describes them, made through their visibility to each other before dispersal. One such public, reminiscent of a Rheingold flash mob, comprises passersby around a digital pop-up installation under Manhattan Bridge in Chinatown, New York (Jaffe 2012). The pop-up is unlikely to sustain a collective sense of place, but the installation's continued material presence has the potential to remake these transient publics. Placemaking like this is confined to specific areas of a city, and produced by adding a piece of art or an engaging activity to an environment or by redesigning its physical attributes.

Beyond beautification projects and spectacles originated by individual makers, institutions, corporations and governments, a distinctive placemaking practice is emerging, characterised by the element of participatory design with a broader set of stakeholders. The movement for collectively remaking a city's spaces, and reclaiming them for inhabitants, has been gaining traction since the late 1960s. The Project for Public Spaces [PPS], a US nonprofit planning, design and educational organisation operating since 1975, has worked on over 3000 placemaking projects in forty-three countries and in all fifty states, with the participatory approach indicated by its logo: 'It takes a place to create a community, and a community to create a place'. The practice emphasises a collective working for common ground in shared values and assumptions about places and their meanings, and a commitment to the extensive consultative processes and inclusivity needed to achieve, animate and sustain them. Considering the renewal of the wastelands typical of cities established during the first industrial revolution, an urban photographer writes, 'Any truly meaningful reinterpretation or reinvention of a site's history must take its context and future into account; it must be woven thoughtfully into the contemporary urban fabric, and animated by its inhabitants' (Lister in Project for Public Spaces, n.d).

A contemporary movement which acts on this philosophy is 'creative placemaking', a professional practice often represented by the work of design companies invited to generate projects with communities for government and corporate clientele. For example, the redesign of urban mobilities in the Boston-Washington mega-metropolis refers to older ideas about supercities and 'Boswash', but uses contemporary digital mapping tools to shape intersecting transit systems and hubs, significantly elaborating on the concept of mobility by envisioning a flexible timeshare basis for areas once seen as separate: private homes and public spaces (Rubin 2012). Another project, successful and on a smaller scale, places multiple swings attached to musical chords into an urban 'dead zone' of Montreal so that, as people participate physically, they can make music together (Fadden 2013).

## 'Smart' placemaking

With the arrival of the IoT and its adoption by municipal planning departments, the convergence of the digital and the physical worlds means that placemaking imperatives will both speed up and change fundamentally, whether they are grassroots-based or the objects of patronage by corporations and governments. Smartification encompasses the oversight of the distributed physical networks, digital data and human agencies which together will co-produce the ubiquitous information flows, and the ambient digital experiences of the future information ecologies. Placemaking becomes a central pillar of urban planning as municipal agencies work with digital infrastructure staff and external partners to develop 'liveability', economic sustainability and tourism potential by deploying all their resources, within the overall framework provided by a city's strategic technology plans and its inventories of data resources. More genuine attempts at co-production of place may result than was evident in the initial stages of the creative industries push (Kent & Nikitin 2013). The new approach is also underpinned by reuse of a city's data, and by opening access for citizens' use. The European Union has early prize-winning examples in Spain's Aporto portal, and Helsinki's Infoshare (European Commission 2013).

However, comprehensive governance of smart systems goes beyond offering citizens open information access and designing portals for information sharing and placemaking. Smart placemaking, developed alongside the current forms, will be a challenging, strategic and integrated project, one where the informating of city spaces will take Australian populations and their municipalities into uncharted technology development, participation and governance territory. Will inhabitants feel a sense of belonging and feel empowered to participate in city-wide placemaking? Citizen awareness, education, understanding and consent to data-driven experiences enabled by the IoT are being seen as critical to a city's success. As Scholl and Scholl (2014) argue, 'open, transparent and participatory government' is the key to establishing the

'new models' of democratic response to smart technologies and practices. Smart norms, protocols, procedures and considerations could develop which limit access or deny urban participation to stakeholders, if they are developed conceptually, democratically and empirically unexamined, without priority attention being paid to investigating project 'failures'.

## Cities as pressure points: A driver of systems thinking

Understanding the non-civic externalities which drive trends in smart uptake by municipalities is important, as it explains its speed and comprehensive nature. The exponential global growth of urban populations is the major reason that municipalities are favouring systems thinking and smart solutions. The United Nations' Department of Economic and Social Affairs predicts that up to 66 per cent of the world's population will live in cities by 2030, with 2.5 billion extra people by 2050. The UN's original estimates have been revised as population graphs show steeper recent rises, indicating that cities will be the pressure points for 'sustainable development challenges' (United Nations, Department of Economic and Social Affairs, Population Division 2014).

All aspects of cities can be a specific cause for concern — their size, amenities, resources, geography, legacy of built environment, and global footprint — as well as the equity with which their inhabitants are treated and the extent to which city-dwellers feel they belong. Mexico City and Hong Kong struggle to deal with waste disposal effectively. Beijing has air pollution levels considered dangerous enough that government advice is to stay indoors on 'orange alert' days. Non-stop influxes of people into Tokyo, predicted to remain the world's biggest city, create problems for the capital itself, and also a loss of human resources, business and revenue for the cities from which internal migrants are drawn (Johnson 2015b). Infrastructure and resource problems faced by European cities have multiplied with increased numbers of refugees and migrants seeking immediate help and accommodation. The collapse of car manufacturing centres in the United States has led to population loss, and to the 'post-apocalyptic' wasteland of Detroit documented in the work of many photographers, most evocatively perhaps in 'The Ruins of Detroit' (Marchand & Meffre 2012).

Newly constructed cities — say, in China — do not have the post-industrial legacy common in Western cities but they are not without serious governance as well as rights issues. 'Apple City', the aerotropolis designed around a hub of economic smart activity in Zhengzhou Airport Economic Zone, is home to Foxconn iPhone manufacturing. Over a quarter of a million workers assemble parts flown in from around the world, and oversee the iPhone units flown out. A business report on the human cost claims that, despite their virtual entrapment in the aerotropolis, Foxconn workers are required to register as living in their hometown. There is no management imperative to make 'Apple City' liveable or responsive to individuals' needs, nor do

employees necessarily have the right to residency in nearby Zhengzhou. They are 'citizens in transit' (Pedroletti 2014), without the means or power to make a more amenable place of the aerotropolis. Worker protection, an achievement of democracies embedded in cumulative legislation for over a century and enforced through collective actions, is missing. Photographs of suicide prevention nets outside accommodation buildings exist, which attest to the desperation caused by exclusions. They are suggestive of what Bauman calls the 'collateral damage' of liquid modernity (2011).

Turning closer to home, Australian residents' experience of place, sense of attachment and entitlement to participate is equally affected by location-specific factors, by access to the city and by socioeconomic status. Under-serviced suburbs impose disadvantages on families, youth, the sick and disabled, the poor and the old, restricting the benefits of living in cities — such as employment opportunities or access to fast broadband, medical and educational facilities — and therefore affecting the right to participate fully in urban life. Distance in Australia has always been a major factor in effective urban planning, governance and placemaking. For example, Canberra, the 'bush' capital, is disposed over a large area relative to its population. The plan for a small light-rail development, to ease traffic flows into the city from a new northern suburb and lessen the need for central parking, has been controversial not simply because of the expected charge on the public purse but also, some argue, because of its inevitable obsolescence as the city grows (McIlroy 2015). Canberrans argue through *The Canberra Times* about inner city property development, and the squeezing out of the young from home ownership, with the resultant impact on social inclusivity. The concentration of vulnerable, high-risk populations in an outlying housing estate, 'the suburb where the only business is a liquor store, and no buses run' (Ellery 2016), particularly animates public debate. The Canberra Centre, a well-appointed shopping mall in the city centre, nevertheless has many 'dead spaces' that divide those with rights from those who are excluded. Surveilled walkways run between buildings where cars and pedestrians share access, and the homeless beg. Inside the mall, Salvation Army collectors are able to sit down, and an attractive illumination, 'A Light Touch', on the wall opposite a major retail outlet amuses consumers' children (Figure 3.2).

Conventional assumptions about people, uses and values are embedded in these examples, but the practice of placemaking can unexpectedly open up. Canberra traders outside the mall recently announced a new revivification fund for small community projects for the city's 'dead heart', Garema Place, because, according to the fund's director, 'No single citizen should curate the city' (MacDonald 2016).

Although cities' specific problems differ, large-scale, complex and individual problems are shared across cities. Planners' attention is justifiably attracted to the smart technologies thought capable of capturing the data necessary for more efficient designs — data which promise to provide timely whole-of-city information and can be used to model future population movements, to predict whole-of-city priorities, and

Figure 3.1: Dead space.
*Source: M Griffiths, 28 May 2016.*



Figure 3.2: 'A Light Touch', Responsive Mural.
*Source: M Griffiths, 23 April 2016.*

to avoid the backlash from publics disappointed by unmet needs. Multiple examples of controversial placemaking, and a growing awareness of public connectedness or the lack of it, exist everywhere in Australia. Youth and children's interests and rights, particularly, require careful deliberation. It is rare to find these groups self-represented in planning discussions, though Melbourne has implemented some strategies of inclusion (Corkey & Bishop 2015). An example, at the building level, is 'Play Up' at the Museum of Australian Democracy, a child-oriented place at the heart of Old Parliament House, popularly visited at weekends. It was designed 'for and by children with the help of adults', according to video signage.

The panoptic gaze of UN Urban Renewal expert panels has resulted in endorsement of a charter of guiding principles on 'rights to the city' for global and local adaptation and implementation. Participatory approaches to urban governance have become the paramount consideration in urban renewal discussions. UN panels determined that, given the complexity of issues and problems that governments face, preserving inclusive 'rights to the city' will need a particular governance: 'Above all, new urban governance should be democratic, inclusive, multi-scale and multi-level' (Habitat 111 2016, p. 3).

Technology is to be put to use democratically in administrative and governance functions for populations, and with populations. A governance approach is useful for analysis of responsive space, where technology may inflict collateral damage by unforeseen exclusions. Data streams 'place' people physically in a city square, and simultaneously locate them as nodes in the IoT, interacting with, and changing, the environment around them. Primary modes of data collection are through mobile usage, beacons and locative devices. The ways that rights are currently conceptualised will need to be supplemented in future by consideration of the limitations imposed by access to and use of technology, and the smart literacies and practices of city populations. Smart phone possession, knowledge of functionalities and app uses, and the ability to navigate data flows will be necessary to fully participate in urban life.

### The second driver: Consumer familiarisation with 'enhanced experiences'

Across industrial and commercial sectors, IoT innovation and uptake is becoming substantial enough for the German government to name the revolution Industry 4.0 — the next stage in the information revolutions that are, as in the past, formative elements in the dynamics of cities. Others name it the Industrial IoT, but it is also social. Characterised by timely data measurement and machines acting without intervention, 4.0 goes beyond automated product assembly to altering a company's relationships with employees and consumers, and it acts as a proxy for the civic domain in both the efficiencies that municipalities hope to gain through smartification, and in concerns about big data's capacity for consumer profiling and invasions of privacy.

4.0 illustrates how new relationships and value chains are made possible: sensors are deployed to protect workers in hazardous conditions, whether they are in mines or on the shop floor; embedded devices extend a manufacturer's engagement with customers by tracking products after sale and returning information to original producers and third parties.

For corporations, adopting the IoT has a consumer-based inflection: Ford, for example, talks about what these technologies can do less in terms of the design of 'product-based interactions', and more in terms of a connectivity which offers the driver 'end-to-end experiences' — and how the changes these technologies bring will play out in everyday smart city planning (Cameron 2016). Thus, after years of machine-to-machine industrial and commercial uses, connectivity now includes people and things in extended consumer relationships. Smart developments may seem singular and dispersed but, scaled up, they signify radical social change.

The discourse of 'enhanced experiences' has been a significant marker of the debate about technology-enabled urban modernity. Pew research based on over 2558 expert predictions of the likely impact of the Internet of Things in 2025 found that the majority framed it positively, with one participant likening it to the way electricity now works seamlessly in everyday life (Anderson & Rainnie 2014). Smart features are increasingly familiar additions to consumer goods (from Mimo's baby-monitoring devices, to Safewise's wearable child and pet tracker, to Nintendo's sleep monitor). These products are all marketed as 'experiences': the first two, promising greater security for children, offer an enhanced parenting experience. The third sells an experience of personal health management. All have the potential to change behaviour patterns and relationships. Such products so rapidly familiarise consumers with the 'smart' functionalities of a range of ordinary goods that the process of data collection and reuse could seem merely part of a seamless continuum of technological advancements to improve individuals' everyday life.

Marketed this way, the changes look beneficial. Though dependent on individual choices, they signify a more technologically invasive future. Manuel Castells argues that 'technology itself does not produce anything', and also that 'power relations are the DNA of society' (2012). The IoT, with human-machine actors, presents a different challenge from broadcast media and prior networks, and complicates a ready dismissal of technological determinism. Rapid migration of the IoT, from its main drivers in consumer and then civic domains, means that tracking the exact points of agency in each adaptation or new use of technology is complex. In the mass uptake of each smart device, and in each new value chain created, there are many individual and collaborative makers, interfaces, algorithmic designs, and evolving and automated connections between specialist businesses and platforms. Such chains disrupt established relationships, as well as generating and anchoring new ones.

In a city, as big data is collected and reused from a vast array of scarcely noticeable sensors, and information ecosystems are formed, the agents involved in helping a city 'talk' become invisible. Their invisibility and pervasiveness and the seamlessness of their operations means that inhabitants have less choice than when they are consumers of individual products. Pre-existing familiarisation with smart devices shapes and possibly restricts municipal approaches to 'experience'-driven civic relationships. Civil liberties groups rightly point to concerns about privacy and surveillance, governmental issues reminiscent of Foucault's disciplinary panopticon, and to the need to preserve the integrity of human agency and data security in these automated, non-transparent processes. The question of how consent is gained for the reuse of personal information, and all the (as yet) opaque affordances of smart technology, animates pessimistic discussions about smart technologies in the consumer domain and amongst privacy watchdogs such as the Electric Freedom Foundation, which tracks technological intrusions into the private domain and gives advice about the protective measures individuals can make to opt out of data collection or internet tracking (Budington 2015; Eckersley, Reitman & Toner 2015).

## 'Open' and 'closed' loops in the city that talks

Industry and commerce have also taken on a significant role as 'explainers' of the smart city for the public and, significantly, for journalists mediating the information in ways they judge appropriate for their particular news publics. The concept of eliminating human error is a much-used trope in introductory explanations about responsive environments. Cisco Australia's explanation of the scale of the change is that people 'can start expecting a more responsive environment', mitigating its novelty by noting that people are already monitoring real time traffic flows on Google Maps. Kevin Bloch, a spokesperson, explains in an interview published in *The Guardian* (Yoo 2016):

> It's responsive because we're measuring and collecting data then making decisions on that data to change the actual city itself … With computers integrated into every piece of physical infrastructure, machines adapt to human behaviour and physical conditions to provide convenience, feedback and efficiency.

Bloch (in Yoo 2016) uses 'open' and 'closed' communication loops to further describe responsive environments. He suggests that the IoT is a closed loop, with predictive benefits:

> Today we're in very much an open loop — something happens, a human makes a decision and that's it. In the future, we're moving to what I call a closed loop environment, where the human will have data coming to it telling you — don't go this way, go that way, or panic, somebody's just died over here — all sorts of things can start coming to you without actually humans intervening in it.

Illustrating the way in which one closed loop might operate, he privileges data-driven mobility over human interventions (in Yoo 2016):

> You go to watch a sports game. Because there are 70 000 people all going to the one stadium, the cost of parking will dynamically go up. At the end of that afternoon, because it knows that people are leaving, the cost of parking will dynamically drop. The actual city itself starts telling you [how to optimise that] rather than you just blindly doing what you've been doing for the last 100 years. That's what they call cognitive systems, autonomous intelligence or artificial intelligence, which starts making the city even smarter than, perhaps, humans are.

The activities described rely on real time information derived from big data, collected, stewarded, narrativised and reused by municipal agencies or corporations. Whether such data serve the demos depends on the level of granularity in the answers to questions about matters such as who collects the data, and why; what the alternative narratives are which can be told from data; who reuses the data, according to what kinds of protocols; and what the overall municipal governance objectives are. If the 'city' is 'talking' to its population, it is imperative to ask about both the premises of IoT scenography designers, and how they conceptualise the civic.

## The scenarios and subjects of the IoT

Contemporary examples of the experimental design of responsive spaces, as represented by news reports or municipal websites, are useful for insights into the social and power relationships they anchor. A fully realised IoT experiment is said to exist at the building level in The Edge, Amsterdam, where 28 000 sensors capture real time, usable data for achieving energy efficiencies and the best use of the building, at the same time as they micromap employee activities. New ways of working, interacting and living are demonstrated in this contemporary panopticon — a vision of a 'smart future' in its transparency, aesthetics and, for some observers, its menace. The Edge primarily houses Deloitte, whose employees are said to endorse its benefits as a 'living lab'. A Bloomberg journalist (Randall 2015) notes the disruption to an orthodox sense of personal space in routine business practices. Fixed locations are linked, in this formulation, to a rigidity in attitudes:

> Since workers don't have assigned desks, lockers serve as home base for a day. Find a locker with a green light, flash your badge and it's yours. Employees are discouraged from keeping a locker for days or weeks because the *het nieuwe werken* philosophy is to break people away from their fixed locations and rigid ways of thinking. (Randall 2015)

Sensors in The Edge allow for ambient personalisation of workspaces through mobile apps set for individual preferences. Surveillance is all-encompassing, beginning with the scanning of employees' licence plates and cross-checking staff numbers before parking access is granted.

Deloitte executives do not, reportedly, have inappropriate access to employees' information; nevertheless, a vast data pool exists and some of it can be accessed by staff

via 'data dashboards'. These give real time collective information about the building's functionalities, which in turn triggers modifications to the physical environment and thus, imperceptibly, to inhabitants' behavioural patterns. In a reprise of the IoT thinking about 'closed loops' discussed earlier, the facilities' manager notes in a BBC interview: 'We want to predict how things will happen in the building, that will be the really smart thing' (Wakefield 2016). Predictive uses of data in the interests of greater energy or business efficiencies limit individual agency for some subjects of the IoT. Though The Edge is an example of smart, sustainable integrated design, what it represents in terms of governing worker communities is neither entirely new, nor innocent of the DNA of social power relations noted by Castells. The deployment of technology could be said to belong to an industrial governance tradition started by socially minded capitalist-reformers from the first industrial revolution. British industrialists, notably (but not always) from pacifist Quaker families, created worker communities around their mills and factories, by offering amenities (like healthcare and community facilities) in exchange for workers' adherence to a set of social rules. Scaled up, the connected communities in buildings like The Edge could represent the responsive spaces of cities: smart neighbourhoods, central business districts and public spaces. Their predictive features make them attractive to contemporary planners.

*Santander, a civic usage scenario*

Santander in northern Spain is a living lab which suggests that the smart revolution enabled by data-driven placemaking is achievable for civic and democratic deployment. Sensors installed over a four-year period measured energy outputs and waste levels, parking spaces, and pavement traffic (Newcombe 2014). SmartSantander was funded by the EU to test the kinds of 'big picture' information that smart technologies could give city governments. The project now has test bed facilities in Belgrade, Lübeck and Guilford. Working from organic metaphors, Santander developed a Cloud City Centre, a 'brain' for the city which provides a visual capture of real time information and a 'Platform': a 'spine' of sensors which include static (fixed sensors), dynamic (those in movement), and 'participatory' types. The latter are the smart phones through which citizens collect data themselves, or report an event (Smart City, n.d.). The council's website notes that citizens participate in multiple civic projects, and in an Innovation Forum for promoting neighbourhood input. Endorsed citizen-based activities, called 'CityScripts', provide workstations to users for access to data to create collaborative projects. One of these, 'Friends', is about selecting a friend who is a follower on Twitter, and revealing his/her shared things and services with others in the group. Data deployed to enhance social bonding work from assumptions about existing levels of 'friendship', and potentially generate new connectivity bonds (Smart City, n.d.)

The governing protocols for monitoring a convergence of humans and things differ in The Edge and SmartSantander, yet these two illustrations of IoT deployment demonstrate that living labs are essential for IoT experimentation, incorporating designs which reflect democratic and inclusive principles for civic domains. MIT regularly initiates applied IoT and big data research, partnered with Santander and other cities, and the civic-focused examples they promulgate on YouTube channels show how 'rights to the city' can be enhanced through making narratives out of data to help planning departments. Using the often prioritised 'efficiencies' discourse of smart planning, one experiment documented 'the cost of justice'. It maps criminal offending patterns by district in New York, against the costs of repeated incarceration of real but unnamed individuals. MIT researchers thus present big data as a prompt for rethinking the use of public funding in the neighbourhoods where offending is, through cross-referencing, shown to be the result of poverty and unemployment. In an example of responsive placemaking, researchers show that the right to safety in the city can be underpinned by smart technologies. A persuasive document, *Public Safety, Justice and the Internet of Everything*, is filled with case studies, from improved emergency response times through smart technology to providing police with enhanced connectivity on investigation sites (Cisco 2014b).

### *'Non-ideological' efficiencies and the publics they serve*

IBM's initial concept of smartification, speedily conceived after the global financial crisis, was persuasive and 'non-ideological'. The company announced the 'Decade of Smart' in 2008 and its CEO gave an influential speech about the need to infuse intelligence into smarter systems and build smarter infrastructure. IBM followed it with a program of strategic engagement at a hundred forums in 2009. By 2010, it was documenting persuasive evidence about smart efficiencies. Then CEO Sam Palmisano highlighted the collective good, arguing that

> building a smarter planet is realistic because it is so refreshingly non-ideological. Yes, debates will continue to rage on contentious issues in our society ... but no matter which viewpoint one shares — or which ultimately prevails in any given society or industry — the systems which prevail will need to be smarter — more transparent, more efficient, more accessible, more equitable, more resilient. (IBM, n.d.)

The success of that goal depends on a political consideration: the governance of smarter systems for the whole collective. In the responsive spaces of the smart city, places and publics will become inextricably linked because, if big data is deployed to govern inhabitants and visitors through the information they themselves provide sometimes without their knowledge or consent, it is indeed 'a collective achievement' (Ruppert 2015). Discussions of design principles are only now emerging as the smart city is being constructed from the top down through formal partnerships between municipalities, technology infrastructure corporations and start-ups. As new ways of

working and living emerge and others are imagined, city governments will be expected to inform populations, and co-create place with them.

Barcelona is a Cisco 'Lighthouse City', its smart developments internationally followed (Cisco 2014a). A mayor linked to the smart city concept was defeated in 2014, on the commons-based renewal platform of activist Ada Colau. Barcelona is now crowdsourcing and co-curating placemaking, and downplaying smart development for its own sake. The mayor of Paris Anne Hidalgo, also a socialist, explains the ethics of participatory governance:

> To build a just, progressive and sustainable city, collective intelligence is our greatest strength. Exchange and debate are our most powerful tools. It was this conviction that led us to make citizen participation a cornerstone of the development of our public policies. Because Paris belongs to the Parisians, I want to put them at the center of reflection and municipal action. I want to give them the means to make their voices heard, practically and simply contribute to the design of large and small urban projects. That's the core purpose of democracy. (n.d.)

Hidalgo is the face of the effective 'co-constructing Paris' portal, *Mairie de Paris, J'ai une idée*, which crowdsources and, through citizen and expert panels, applies proof of concept tests to ideas registered by citizens for improving Paris.

## Making an Australian 'smart' city and citizens

The city council in Adelaide governs only the central business district, but its power to shape the city as a whole derives from its close strategic relationship with the government of South Australia. Effectively, the two bodies engage in most city initiatives on built environment, including communications infrastructure. South Australia has specific challenges, compounded by its perceived geopolitical disadvantage as a state with only one major city, when every Australian city is in competition. The loss of the car manufacturing industries, the downturn in mining profitability, the drift of professional workers and the young to the eastern states, and a host of other difficulties imposed by distance are major reasons why city and state have together embarked on ambitious renewal plans, incorporating the IoT in placemaking.

The city describes its ambitions as beginning on a small scale, at street level, with a project called Splash Adelaide (Adelaide City Council 2012), encouraging start-ups and community activists to break city by-laws on closing times, and allowing street activities in arts and business projects aimed at revitalising the city's dead spaces. Organisers were not to infringe civil or criminal law, but people were allowed to fail so that the city council could learn from their mistakes (Johnson 2015b). From that point on, selected city neighbourhoods were seen as distinctive places with invisible boundaries, yet coherent identities. AdelaideFree, the city wifi, was in place before the IoT was adopted as an underpinning strategic enabler for future developments.

When Adelaide was declared a Cisco 'Lighthouse City' (Department of State Development 2015; Cisco, n.d.), a year after a Memorandum of Understanding was agreed between the state government and the technology provider, Mayor Martin Haese spoke in terms of increased liveability and economic benefits, and of the practical uses (in smart street lighting and traffic controls) which would make the city safe for residents and attractive to visitors (Corner 2015). A buzz around smartification followed: driverless car trials were announced and took place on state highways; the city's Smart Hub was launched in November 2015; air-monitoring has been piloted.

One approach to citizen education about the benefits of the IoT has been to experiment with storying the technology-enhanced experience of a young professional returning to Adelaide to set up a business. From her searches online to her access to information about data on pedestrian traffic flows and possible competitors, the city's IoT makes her return easy in a storyboard (Figure 3.6).

IoT developments are enabled globally by formal partnerships between governments and infrastructure providers like Cisco, as well as Hitachi and Microsoft. These entities possess big data on residents and different remits from government. The remits are not mutually exclusive, or irreconcilable. As yet there are no clear joint pathways for deploying what is learned from big data. User-informed consent or opt-out provisions have not yet been worked out. To date it seems that the missing municipal partnership is with the city's own publics. Every municipality has a plethora of end-users who may know little about the predicted benefits of the IoT and who already have concerns about the privacy and security of their data and the reuse of such data. An IoT report from the EU's DG Connect, addressing the social and ethical dimensions of the IoT, prioritises governance and trust as key issues (van der Hove 2015).

In early 2016, as part of a larger study ('Smart technologies and cultural heritage'), I ran Adelaide- and Canberra-based pilot studies on awareness of, and attitudes to, smart technologies (Griffiths 2016). It found that low numbers knew about the concept of a smart city, and even fewer people had a sense of what smart technologies might enable, or of their impact on everyday life. Even so, most participants were open to the concepts of responsive environments, while noting concerns about privacy, autonomy and questions about the curation of information. This suggests that the challenge for smart placemakers will be to create informed engagement with city populations through dynamic and repeated consultations with representative publics, and those most concerned in each development; and to find ways to deploy the power and imagination of the collective. Identifying shared 'place capital' will prove necessary (Johnson 2015b) as will ensuring citizen empowerment (Gurstein 2014). Participatory governance is local government's challenge (Aulich 2009).

Big data techniques could shape a civic governance infrastructure for multilevel collective decision making, beyond the consultative protocols already in place in

Figure 3.3: Smart Hub.
*Source: M Griffiths, 25 February 2016.*



Figure 3.4: Location of Smart Hub.
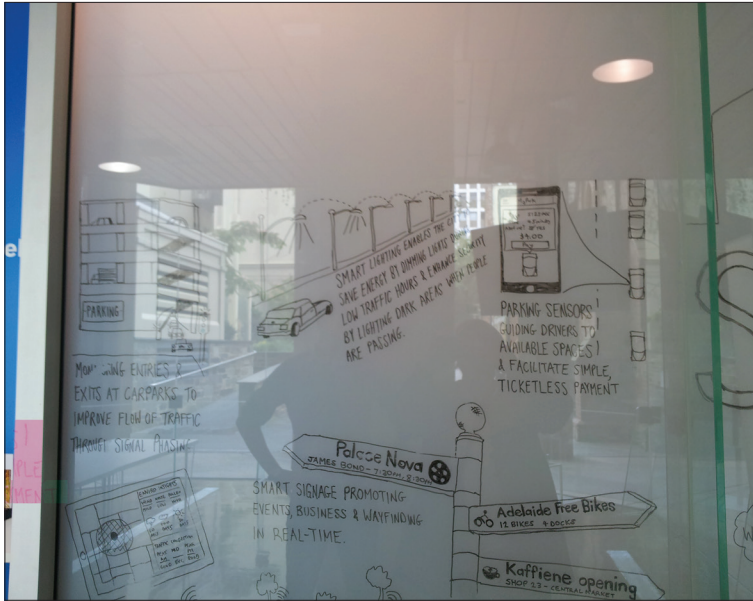*Source: M Griffiths, 25 February 2016.*

Figure 3.5: Mapping connections, Smart Hub.
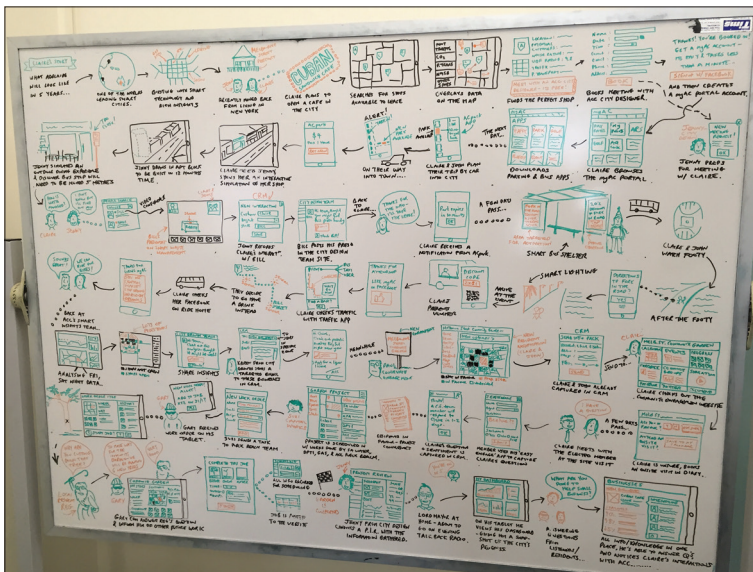*Source: M Griffiths, 25 February 2016.*



Figure 3.6: 'Smart' storyboard designed by Peter Auhl and the Information Management team, Adelaide City Council.
*Source: S Ladd, 23 February 2016, published with the permission of Peter Auhl, CIO, Adelaide City Council.*

South Australia. The record on Australian federal government consultations with citizens on digital policy has been patchy, even over the most successful period of e-government developments (2000-13), although the open-data movement advances e-government objectives of transparency, accountability, efficiency and effectiveness by, among other initiatives, advocating principles to help construct improvements in civic discourse, public welfare and public resources. South Australia's website data.sa.gov, Data Directory, Location SA and the spatial dataset Geocoded National Address File (G-NAF)[1] are examples of local implementation, and they illustrate the state's commitment to open government, to collaboration with other authorities, and to visualisation of data for citizen education and use. In October 2016, South Australia will launch OpenState, a festival with a focus on doing planning and consultation differently, more openly. At a preliminary event, state premier Jay Weatherill spoke in strong support of increased transparency and reversed the statement about people's diminishing trust in politicians, arguing that it is politicians who should trust people with participatory decision making. This bodes well for Adelaide developing as a citizen-oriented smart city.

**Conclusion**

Gartner forecasts in 2015 indicate that although smart cities will use 1.6 billion connected devices by 2016, the most rapid growth in smart uptake until 2018 will be in corporate buildings, after which uptake in smart homes will overtake them (Player 2015). Time spent in a smart home will accustom people to expect individuated responsive scenarios elsewhere, though user literacies will be needed to optimise experience (Tsukayama 2016). Participation practices such as those instituted in Santander may help populations appreciate improvements in shared civic experiences, but well-informed advocates for citizens' rights, and explainers, will be needed at all points of the city's 'smartification' processes. As IoT technologies are emergent, careful scrutiny and oversight protocols will be required to ascertain exactly how they are being used to make places and who they benefit. Smart sensors have the capacity to blur the distinction between humans and things as unique identifiers in the new ecosystems; municipalities are also likely to face difficulties in designing the inclusive consultative mechanisms for informed public deliberations, commensurate to the complexity and speed of IoT uptake. Smart governance systems will need to evolve to address these challenges (Griffiths 2016).

Whenever communication technologies offer innovative, socially generative forms of connecting people to place and through place to each other, anxiety and hope are typically expressed in equal measure about the human future enabled by each

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1   Location SA: <http://www.location.sa.gov.au>.   G-NAF: <https://www.psma.com.au/ products/g-naf>.

advance. Philip Howard, writing of the IoT era from a global perspective, calls it the Pax Technica. One of its premises is that 'people use devices to govern', and though Howard envisions the civic potential of what he names 'the liberation technologies', he warns, '[y]ou are about to get many more such devices, and we need to think about what sort of world we're being liberated into' (2015, p. 256). This is the critical democratic question about placemaking which user advocates need to ask of smart city planners.

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