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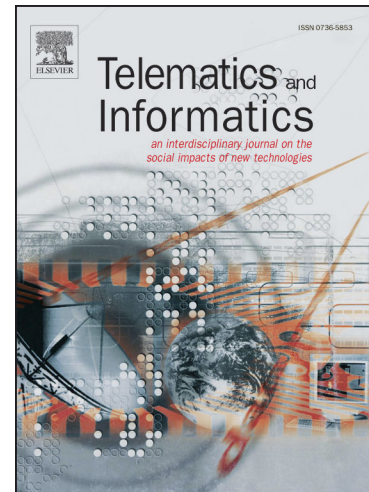
Modes of Making Smart Cities: Or, Practices of Variegated Smart Urbanism

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Modes of Making Smart Cities: Or, Practices of Variegated Smart Urbanism

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Modes of Making Smart Cities: Or, Practices of Variegated Smart Urbanism

1. Introduction

To paraphrase Tolstoy, each smart city is smart in its own way. The ‘actually existing’ smart city is not a monolith (Shelton et al. 2015). It is not directed by a universal logic, nor does it develop in a standardised or linear way; even withstanding the attempts by its most powerful advocates to roll out the smart city as a singular socio-technical imaginary (Sadowski and Bendor 2019) with solutions and services, values and visions, that can be plugged in anywhere, anytime, thus reconfiguring an existing urban environment into a smart “generic space” (Greenfield 2013). Rather, as a recent wave of research has argued, when the real smart city takes shape it often does so in ways that are retrofitted and piecemeal (Dowling et al. 2019). The initiatives have an *ad hoc* quality: existing stuff is upgraded and replaced, here and there, based on what resources are available, what is achievable, and what opportunities arise. The strategies are often *post hoc*: they are not always established beforehand but are developed during implementation (if not afterward) to give coherence to a constellation of projects and outcomes that are already in place.

This is not surprising considering that these initiatives and strategies must contend with the different spatial, cultural, and political contexts of the host city, which in turn have major influences over what smart urbanism looks like in practice (Bulkeley 2016 et al.).¹ For example, by studying the development of smartness in the Indonesian cities of Jakarta and Surabaya, where informalism is a defining feature of urban planning and life, we can see how smart initiatives unfold in an improvisational way because the models developed in Western countries “need to be adapted for cities in emerging economies” (Offenhuber 2019: 1565). Whereas in Rio de Janeiro, Brazil, spatial media technologies like Google Maps are actively trying to overcome informalism in the favelas by rendering this territory as legible and calculated, thus incorporating it into the economic operations of capital (Luque-Ayala and Neves Maia 2019). Or, if we look at Singapore, we can see how the smart city-state, or Smart Nation initiative as it is called, are deeply entangled with “the neoliberal-developmental logics of the state, thereby facilitating authoritarian consolidation in Singapore” (Ho 2017: 3101). Whereas in Barcelona we can see a transformation underway as the city makes a radical shift from embodying the corporate model of smart urbanism due to its close partnership with Cisco to being at the vanguard of developing digital platforms for enacting participatory democratic versions of smartness (Charnock et al. 2019; Lynch 2019).

These examples, and the tensions between them, illustrate how the actual practices and outcomes of smart urbanism are themselves products of processes that vary from place to place (see also Cowley and Caprotti 2018; Datta 2019; Hatuka and Zur 2019; Hoyng 2015; Wiig 2018). Research in telecommunication policy has centred the role of urban governance regimes in shaping the character of specific project and responding to corporate agendas has been centred in research work (Alizadeh, Grubestic, Helderop 2017; Anand and Navío-Marco 2018; Monahan 2020; Tang et al. 2019). However, the point is not to argue that smart cities happen haphazardly, with no shared logics or drivers connecting together these diverse projects. Indeed, recent work has argued for an approach to the smart city based on a holistic and historical understanding of such projects (Walravens 2015; Yang 2020), which emphasises “internal alignment in smart city initiatives” by considering how they are interconnected (Oomens and Sadowski 2019).

Rather, what these examples have in common—and what this article seeks to show—is that these projects are very often the result of a relationship between the dominant interests of initiatives and the material conditions of implementation. In other words, a theme emerging across this empirical research, which speaks to earlier theoretical and critical scholarship on smart cities, is quite simply that the reality of a particular smart city is shaped by the interplay between its political economy (whose interests) and urban geography (what places). This is not a radical proclamation, but it is an important observation that can be easily flattened when critiquing an overarching model or ignored when focusing on specific technologies. Moreover, the reality of who makes smart cities tend to run contrary to scholarship that advocates for the role of public engagement and stakeholder collaboration in applied urban

¹ Even those rare mega-projects where a smart city is built-from-scratch, such as Songdo, South Korea or Masdar City, UAE, are not conceptualized in vacuums, nor are they constructed in pristine places. They are supported by networks of investment and ideology. They are situated within relations of space and state.

informatics (Kopackova and Komarkova 2020; Ju, Liu, Feng 2018; Ma, Lam, Leung 2018; and Niaros, Kostakis, Drechsler 2017)

This paper contributes to the analysis of variegated smart urbanism by describing three different modes of making smart cities, as we call them, each one centred around a different key actor: corporations, citizens, and planners. This approach to understanding smart urbanism is based on the highly influential work in geographic political economy on “variegated neoliberalization” by Brenner, Peck, and Theodore (2010). As they explain, “‘neoliberalism’ has become something of a *rascal concept*—promiscuously pervasive, yet inconsistently defined, empirically imprecise and frequently contested” (Brenner et al. 2010: 184). Their response is not to abandon the concept, but rather to understand it as a dynamic process, not a fixed thing, that contains multiple meanings and manifestations. We argue that “smart urbanism” has similarly become a “rascal concept” in the same fashion as neoliberalism. Thus, in an attempt to provide a more precise analysis of its varied states, we set out to empirically study how it is being made in different places. From that empirical research we observed the three different modes—understood as three variations of smart urbanism—described in this paper.

We situate our analysis of these modes in two Australian cities and one regional council, all of which are early adopters of smart urbanism in Australia: Parramatta, the second central business district (CBD) in Western Sydney; Newcastle, a regional centre north of Sydney; and the Sunshine Coast, a large local government area north of Brisbane, QLD. These three modes are not a full accounting of how or for whom smart urbanism manifests, but are instead meant to represent archetypes that became apparent as we analysed our empirical data. There are other modes worth explicating, such as those centred around property developers or non-governmental organisations, and we hope future work will help build out the framework we describe here. Moreover, the ways each mode manifests in our field sites are not meant to be universally true—this would contradict the statement above about the central role of spatial and material conditions—yet, this analysis is meant to illuminate similar dynamics happening elsewhere. The purpose of seeing smart urbanism as a variegated process is to emphasise the diversity of practices and outcomes that the burgeoning empirical literature has illustrated around the world, while also recognizing that these different smart cities do not emerge randomly, with no discernible patterns across causes and effects. The task ahead of us is to create analytical tools for piecing together those patterns—this paper contributes to such efforts.

The paper’s next section explains the qualitative methods used for our empirical research on smart urbanism in multiple cities. The third section then situates our analysis by providing some context about how smart urbanism has developed in our case cities. The fourth section outlines three modes of making smart cities. We describe the purposes motivating each mode, the processes and people involved in implementing each mode, and the product of each mode. The paper concludes with reflections on how (smart) cities are built as ways to materialise the values and realise the goals of some interests over others—and why new modes of making are needed.

2. Methods

We conducted qualitative research in each of the three case cities with the aim of better understanding how smart urbanism is actualised, who's involved in making decisions, and why they are doing it. Broadly, our research involved interviews with key actors, in-situ participant observation, and analysis of relevant documents (both publically available and privately acquired). While we collected similar types of data from each place, research was conducted in somewhat different ways. Importantly, though, our goal here is not to conduct an in-depth comparison between these cities, but rather to use them as illustrative cases of particular modes in action. The methods we deployed and data we collected in each place are sufficient for that purpose. Although there is variation in the number of participants and roles in each city, this is reflective of the variegated and contextual nature of smart urbanism: different cities adopt different approaches dependent on their context.

In Parramatta, data was collected as part of a two-year ethnography with strategic planners in the city government focused on the politics and practices of implementing smart city initiatives. In that time, semi-structured interviews were conducted with 20 key informants—many of whom have been interviewed multiple times over the project—who hold key positions related to smart urbanism in the city government (e.g. head of FCU, head of IT, city councillors, Smart City Advisory Committee members) or with vendors contracted to provide smart city services. Informal discussions were had with over 30 people involved in smart city operations and/or urban innovation in Parramatta. These conversations were supplemented by analysing a large corpus of both publicly available and internal documents relevant to smart urbanism in Parramatta, including smart city masterplans, project reports, slide decks, meeting minutes, and marketing materials.

The Sunshine Coast and Newcastle material comes from a broader study of smart cities in Australia. The broader study included four local governments (the others being Adelaide and Melbourne) chosen to give an insight into the different ways early-adopter cities in Australia were framing smart cities (see author). Semi-structured interviews were conducted with representatives involved with smart strategy and vision. In the Sunshine Coast Council, interviews were conducted with the Lord Mayor, Chief Information Officer, Smart City Framework Coordinator and the Smart City Centre Officer. In Newcastle, interviewees included the Lord Mayor, Smart City Coordinator, Director of Planning and Environment, and the City Revitalization Coordinator. The number of interviewees for each city, while smaller than the Parramatta case study, were targeted at the key players in each city's smart urbanism activities and revealed the key motivations, practices, and processes involved in their smart city transitions. Similarly to Parramatta, interviews were supplemented with analysis of documents that detailed the vision, planning and progress of smart urbanism in these cities.

Interview material was coded and analysed thematically in NVivo guided by questions related to the drivers, governance and implementation of the smart city. Other themes emerged organically from the coding process. Analysis of the interview material was combined with the document analysis to build a comprehensive picture of the visions, policies, planning and practices of each smart city. The analysis of this

empirical material led to identifying the three modes of smart city making discussed here.

There are of course limitations to using a range of qualitative methodologies across three different cities and synthesising these. For example, we have a large data set but the information gathered at each site is not necessarily uniform as each city takes a different approach to the smart city. Such data is more appropriate for thematic analysis rather than for drawing deep comparisons and evaluations. As noted above, using these data sets limits in-depth comparative analysis and the ability, for example, to “benchmark” each city on their performance or a certain characteristic of the smart city. However, such quantitative or comparative analysis is not our goal here. Instead, we use each city as a case study for each of the modes of making a city smart, which were derived from the thematic analysis of the whole set of qualitative data collected across all three cities.

3. Context and Background

Australia offers an interesting contrast to the rise of the smart city elsewhere. Unlike Europe and the US where smart urbanism was enabled by austerity governance post GFC and were initially corporate driven technology interventions in the city (Sadowski 2020), Australian cities had different drivers and relationships with technology companies. Many of the smart city initiatives in Australia are responses to industry changes from mining and manufacturing to knowledge economies; the need to attract and retain talent; and to manage the city more efficiently (Maalsen et al 2018; Dowling et al 2018). Although the Federal Government launched the Smart Cities Plan in 2016, in which innovation and smart city projects were delivered through funding arrangements in the form of City Deals, there had been significant “smart” activity, occurring at the scale of local government for some time (Dowling et al 2018, 16).

Importantly, from the beginning, Australian cities were and remain vendor agnostic, and rather than accepting off the shelf packages, demand that vendors meet their specific needs (Maalsen et al 2018; Dowling et al 2018). This has led to a growth in smart cities that have different priorities. For example, Adelaide pitches itself as a people-centered smart city, whereas Melbourne’s smart city ambitions are linked with leveraging the potential of their student population for innovation (Maalsen et al 2018). To get a better understanding of these variegated developments, we shift focus away from major capital cities and toward other places that are pursuing smart initiatives. The rest of this section will provide contextual background about each of our case study locations.

Newcastle is a former mining town about 2 hours drive from Sydney. Newcastle’s smart city strategy was similarly underpinned by the recognition the city needed to transition from an industrial economy dependent on mining to a knowledge and innovation economy as a sustainable and viable economic foundation. The desire for a smart and innovative city emerged as a key theme from a broader community consultation as part of the city’s 2030 plan. Anchored in two early smart city successes, the Darby Street Project and the \$19.8 million Hunter Innovation Project, the city rolled out various smart initiatives until formalising them in the City’s Smart City Strategy 2017-2020. While Newcastle City Council plays a key role in the

development of the smart city, including internal restructuring to include a Smart City officer, and coordination of activities that can be broadly considered inclusive of “smart,” it is not solely tasked with building smart Newcastle. Partnerships with key industry and community stakeholders have been key to the success of the smart city, as will be elaborated on below.

The Sunshine Coast Council governs a large area with a comparatively small and ageing population in regional Queensland, north of Brisbane. Its shift to the smart city was driven by the opportunity to revitalise the economy by leveraging the innovation and knowledge economy, and using smart technology to increase the efficiency of governance and generate revenue. Traditionally an economy dependent on the service industry and tourism, their smart city transition emphasises growth in the digital economy and associated higher value industries (Dowling et al 2018, 17). The region's Smart City Framework is built upon a high-speed fibre optic network, seen as the foundation for building the digital economy (Maalsen et al 2018, 72). The region's Smart Management Platform is key to increasing efficiency of local government services via streamlined management, integrating smart city solutions, and enabling the collection and analysis of data (Sunshine Coast Council 2016: 11).

A brief history of how smart urbanism has developed in Parramatta over the last decade is instructive for seeing how a mid-sized city—the kind of place that is far more common, globally, than the “global cities” like Sydney or Melbourne—has tried to pursue a dynamic agenda for smart urbanism. While Australia as a whole was a late arrival to the smart city movement compared to the US or Europe, Parramatta was an early adopter, starting its smart city planning in 2009. Indeed, Parramatta has already gone through three distinct phases in its smart city development, yet it has not garnered much attention because its initiatives and strategies have been largely kept in-house, rather than through attention grabbing partnerships with major corporations. Each phase of smart urbanism was situated in a different department of the city government with, sometimes radically, different people, values, and goals directing how/why smartness in Parramatta took shape. There are few people who have remained consistently involved across these phases. When combined with a constant rotation of new people and hard to find documentation (e.g. meeting minutes and reports), this has translated into poor institutional memory over the last decade of smart city experimentation. It became a common occurrence, when asking a key government employee about how the smart city has developed in Parramatta, to find out that we knew far more about the past than the informant did. To be clear, this is not meant to be a slight against Parramatta. Rather it is indicative of organisational dynamics within local governments, which thus affect the on-the-ground realities of smart urbanism—what it means and how it's made.

In broad strokes, the Parramatta smart city began under the auspices of the city government's Department of Information Technology, which attempted to roll out large-scale, ambitious projects that largely failed for both technical and organisational reasons. The example most often talked about by people involved in this early phase is the ParraConnect smartcard, which was meant to be like an all-access pass to the city. Its intended uses included accessing council facilities, checking out library books, and getting discounts from local businesses. The card still exists; however, it is now only used to access the CBD parking garage.

In the second phase, the smart city was moved in 2014 to the Department of Marketing and City Identity where becoming a smart city played a core role in Parramatta's mission of, according to its tagline, "Building Australia's Next Great City."² The logo and tagline can be found on the side of smart trash bins in public spaces. Another major initiative to come out of this phase was a 2015 Smart City Masterplan created by a consulting firm. The masterplan is essentially a branded report-cum-brochure that outlines the guiding principles/vision and offers a catalogue of "sample initiatives," thus demonstrating that the city is thinking seriously about being smart. If you search for information about the smart city in Parramatta, this masterplan is still one of the only results from the government. However, a planner overseeing Parramatta's smart strategy said in an interview that this masterplan has little to no actual bearing on the city's strategies and initiatives.

Finally, the current phase of smart urbanism in Parramatta, which we will explain further when describing the planner centric mode below, was initiated in late 2016 by the creation of the Future City Unit (FCU) in the Department of Strategic Development and Outcomes. The FCU is a small unit of strategic planners and project officers with a few mandates that guide its activities. They provide support for a range of smart projects across the city government, some of which predate the FCU, and pull them together into a coherent strategy (or "roadmap" as they call it). They initiate and lead projects that are meant to address specific problems or discover useful information, while also building capacity within the government for using digital and data technology for decision-making. They also build connections with new vendors by trialling their technology or contracting their services.

4. Who Makes the Smart City?

As we show, the following modes can, and do, co-exist in the same city and region. At times, they are competing logics that fight to pull the city in different directions. Yet, they can also be complementary interests that work together to create, and mutually benefit from, smart city initiatives. The following section aims to describe the purposes motivating each mode, the processes and people involved in each mode, and the product or outcome of each mode. We illustrate these three modes with our cases from Australian cities. We focus on only one place per case study for purposes of structuring our analysis, but we observe aspects of each mode across the different field sites. The specific details of how each mode manifests are situated within their specific urban contexts; thus, they may not translate directly to other cases. However, as analytical categories and abstracted processes, each mode is also unfolding in smart cities around the world. We hope that future research will trace how these modes—and other possible modes—are arising in different places and via different practices.

4.1 Corporate Centric

The corporate centric mode can be defined as one wherein the visions, solutions, and services sold by (major) technology vendors dictate how the smart city is constructed

² See Barns and Pollio 2018 for an informative article that traces this phase in Parramatta's smart city development.

and operated. There is no doubt that the corporate model, over the last decade since IBM and Cisco initiated their respective global smart city initiatives, has captured the minds of practitioners and scholars, proponents and critics. And for good reason considering that this model is by far the most dominant and widespread imaginary of what smart urbanism looks like (Sadowski and Bendor 2019). As Hollands plainly states, “There exist no large-scale alternative smart city models, partly because most cities have generally embraced a pro-business and entrepreneurial governance model of urban development” (Hollands 2015: 70). While this statement is almost certainly true in terms of influence and scope, we also want to trouble it in a few ways.

First, it’s important to emphasise, early and often, that there are alternatives to this model (McFarlane and Söderström 2017)—as this paper also shows—and there are instances where corporate smart infrastructure is appropriated and repurposed for other ends (Perng and Maalsen 2019). Second, what “large-scale” means is up for debate. For example, we are now seeing the emergence of different modes at the city-scale, such as the “Barcelona Model” that aims to “harness digital platform technologies to enhance participative democracy” (Charnock et al. 2019: 1), and even at the international level as major cities globally have joined Barcelona in forming the Cities Coalition for Digital Rights. (Granted, when Hollands (2015) was writing these alternatives did not exist or were still nascent). Third, when the corporate mode is rolled out in a city, it is not done so in a singular way nor does it have generic outcomes, if only because these initiatives must fit into or overcome specific material conditions and contexts (Bulkeley et al. 2016). Consider how the corporate centric mode has arisen in Australia.

While Australian cities remain vendor agnostic and committed to developing the smart city that meets their needs, rather than the needs of corporations, it does not mean that there is no corporate influence. At the same time, Australian cities offer a different proposition to corporations, than their European and US counterparts.

Australian smart cities are tied to economic, innovation and growth agendas because of changes in industry, dwindling budgets and the need for new revenue streams (Maalsen et al 2018). As local governments are asked to do more with less resources, the smart city offers them a route to efficiency and economic returns. This necessitates Councils partnering with vendors to supply the technology, platforms and resources they don’t have in house. For example, the Lord Mayor of the Sunshine Coast Council, a regional local government area in South East Queensland, notes that the region’s rapid growth means that Council can no longer rely on rates plus CPI as their financial foundation (interview 29 September 2016). Technology is viewed as a potential way for Council to partner with a range of people and corporations and to get a share of that dividend (Interview with SCC 29 September 2016). There are clear pragmatic drivers.

The geography and scale of Australian cities, also cannot be overlooked when considering the influence of corporations. Beyond the key capital cities, there are next regional and smaller centres, which often see local councils governing large and comparatively low populated areas. This physical characteristic dictates the relationship between local government and corporate agendas on the basis that smart city vendors are looking for return on investment and regional and smaller centres do not offer these returns:

“...local governments tend to end up doing a lot of these things themselves because you take that national play by a company, well they're only going to want to actually deploy it where it's commercially viable for them. ...not all of the private sector entities will necessarily want to respond to where the local government is servicing or needs to service. ...public, private partnerships are generally best driven where there is a value proposition that the private sector wants to be involved and help to drive. There's a return on investment. Where public, private partnerships breakdown is that you actually want a service beyond the viability path.” (SCC 29 September 2016)

Local context, geography, regulatory system, and the three-tiered government of Australia, all impact the private/public relationship. For example, the council does not necessarily control all the assets that are general targets for smart reconfigurations – these could be owned by Federal or State government or utility providers. This presents additional challenges when trying to implement new technologies as much of the key infrastructure that such technologies depend upon is not always within local government's control. Combining this complex governance system with the geographical constraints mentioned above means that Australian cities offer different opportunities and need different things to international contexts, where many of the multinational corporations developed their products.

Such difference is reflected in governments expectations of their relationship with potential corporate partners. Local governments are experts in their areas and recognised that while corporations could draw upon global networks and resources, their experience overseas doesn't translate to the specific local context, and councils expect vendors to translate their offerings to local assets and values:

“We were just keen to make sure that we could articulate and Cisco delved into their worldwide network of people in different places but we were very careful to make sure that the values that are used here are the Sunshine Coast values. Barcelona's revenue from car parking is Barcelona. It's a multi-million population city. So we need to actually be accurate and responsive to our local community. That's one of my big things is because any consulting firm can go London this and Barcelona this and Paris or Amsterdam but we are... It doesn't translate, so let's be careful about what we do translate in terms of those values” (SCC 29 September 2016).

Thus, while cities depend upon the resources, products, and partnerships provided by corporate vendors, their expectations around delivering for local needs, combined with geographical, regulatory and governance constraints determine the public-private relationship. In this sense, while there is private influence, the smart city develops in partnership and navigates some of the earlier criticisms of the corporate smart city. Sunshine Coast Council's approach illustrates how local context is powerful in shaping their smart city needs and possibilities, and that being grounded in the local in-turn shapes their partnerships with corporate vendors.

4.2 Citizen Centric

The citizen centric mode can be defined as one wherein public participation and/or community values are held up as essential features of building and maintaining a

smart city. Australian smart cities make note of their ambitions to be citizen centric. The degree to which they really place the citizen as an active decision maker in the smart city however, can be contested.

The degree to which this is actually inclusive of the public is however varied and subject to critique. Discussing the BSI, Joss et al (2017, 40), identify four modes of citizenship in the smart city: “service user”; “entrepreneurial”; “political”; and “civic” (Kitchin et al 2018, 10). They note the prevalent framing of the smart city as in the service of citizens as a rhetorical device that legitimizes smart city development as citizen-focused rather than technocratic. In this sense, they argue that citizens become “co-opted” by the smart city, given limited agency, which they hold passively through having socio-economic needs, consuming and producing, rather than actively exercising agency (Joss et al 2017, 40). Similarly, Cardullo and Kitchin critique the relative lack of agency awarded to citizens of the smart city. Applying Arnstein’s (1969) “ladder of participation” to citizen roles in the smart city, Kitchin et al (2018) argue that citizens predominantly occupy:

“non-participatory, consumer, or tokenistic positions and are framed within political discourses of stewardship, technocracy, paternalism, and the market, rather than being active, engaged participants where smart city initiatives are conceived in terms of rights, citizenship, the public good, and the urban commons” (Kitchin, et al 2018, 9)

However, citizens are not completely devoid of agency. Citizens also make small yet noteworthy interventions in the smart city that illustrate the reclaiming of agency and the disruption of the corporate smart city. Smartness, as a series of infrastructure, policy and practice, can be co-opted, appropriated and reinterpreted (Perng and Maalsen 2019). Three practices of challenging the corporate smart city are identified by Perng and Maalsen (2020) as worthy of exploring, these being: “retrofitting”, “repurposing”, and “reinvigorating” city infrastructure as modes of civic infrastructure (Maalsen and Perng 2020, 2). Although such interventions are minor, they are tools for creating different smart city imaginaries.

In Newcastle, a key element of the citizen centric framed smart city, is local government’s consultation, collaboration, co-creation and co-design with the community (Maalsen et al 2018). These processes ostensibly assist local government identify the needs of the local community, better engage with them, co-create responses, and be agile and flexible enough to adapt to changing needs (Maalsen et al 2018, 78). Newcastle’s, Smart City Strategy, for example, emerged out of extensive community consultation as part of the 2030 community strategic plan:

“That consultation was extremely broad and very open..... It involved thousands of people. It wasn't confined to what your local council does. It was saying to people in this city - and it was targeted from youth - the demographics were targeted all over the city. There were breakfast meetings, there were night time meetings, there were hundreds of people at round tables, Post-It note-type World Cafe style and submissions, everything.” (NCC Mayor 23 August 2016)

Rather than just seeking feedback, the consultation was aimed at understanding what type of city people wanted Newcastle to be. A smart and innovative city emerged as one of seven core themes from the consultation, partly due to the

community's ambition for a sustainable economic transition post-mining but also because of the ability to leverage the creative and entrepreneurial sectors of the community (Dowling et al 2018).

While the materialisation of Newcastle's smart city through the award winning Darby Street project and broader concern about developing a safe night time economy has been discussed at length elsewhere (see Dowling, McGuirk and Maalsen 2018), the involvement of stakeholders beyond the Council illustrates the ways in which the community focused approach to a smart and innovative city, identified in the community consultation, is carried throughout their Smart City Strategy. Community partnerships were key to the Darby Street Project and the Hunter Innovation Project, in particular with the local business improvement association, Newcastle Now.

Such partnerships became essential to driving the smart city. For example the 19.8 million dollar Hunter Innovation Investment Fund's success was based on a partnership between the council, the University of Newcastle, Newcastle Now and Hunter DiGiT who represented the community. The core of four partners had additional members from industry, TAFE, New England Health and CSIRO.

As the City's Smart City Officer observes, these groups coming together as a collective rather than competing individually, was key to winning funding. Previously, groups would often compete individually, lacking a unified regional voice, which hampered State and Federal Government funding decisions (NCC SCO 23 August 2016). By working as a collective, the group was able to present a comprehensive unified voice, which secured a substantial amount of funding. The partnership has continued as a collaborative strategy group, preparing applications for consortium funding from different sources (NCC SCO 23 August 2016).

Community partnerships are a core part of Newcastle's smart city success but that does not mean citizen agency is incorporated across all of smart Newcastle. There are varying degrees of participation and agency. Drawing upon Cardullo and Kitchin's (2019) scaffold of smart citizen participation, we can see Newcastle's positioning of citizens in the smart city is reflective of both tokenism and citizen power. The comprehensive consultation on the 2030 strategy from which the idea of a smart and innovative city emerged is a traditional form of citizen engagement and tokenistic. Citizen contributions to decision making are restricted to giving feedback at consultation under the rhetoric of civic engagement (Cardullo and Kitchin 2019, 5). In fairness, consultation practices at this scale are constrained in how much direct citizen engagement they can enable.

However, the community partnerships constituted by a range of stakeholders that we see materialise through projects such as the Darby Street Project and the Hunter Innovation Project, are indicative of citizen power. Citizen power in the smart city, is characterised by partnerships, co-creation, participation, is often bottom-up, collective and autonomous (Cardullo and Kitchin 2019, 5). Clearly, the multi-stakeholder partnerships that drove these projects have elements of this and again, while they are not reflective of the smart city strategy in its entirety, they show ways in which citizen agency can be enacted. Small interventions as Perng and Maalsen (2019) have argued, are not to be discounted and are valuable because of the possibilities they suggest.

The smart city that is ostensibly developed to serve citizen needs, therefore predominantly positions citizens as consumers and customers, with limited participatory agency and tokenistic roles. As always however, it is not a clearly defined space, and while Newcastle Smart City's inclusion of citizens sometimes reflects that tokenism – providing feedback via consultation activities – it also offers opportunities for exercising citizen power, most strongly reflected in the collectivisation and collaboration of community groups. Even where there is citizen agency, it is important to think critically about how representative this collaboration is of the broader community.

4.3 Planner Centric

The planner centric mode can be defined as one wherein the methods and aims of professional strategic planners guide the design and implementation of smart initiatives.

For a movement that is meant to be about designing and governing cities, professional planners have been curiously absent from the scholarship on smart urbanism. When they do appear, studying their practices and strategies, or understanding how they think about smart cities, is rarely the focus. This begs the question, does the smart city have planners? On one end of the analytical spectrum, Cowley and Caprotti (2019: 428) argue that the smart city is, in fact, a form of “anti-planning” based on the “implicit rejection of the strong normativity of traditional technologies of planning.” This view of planners, from the perspective of the tech companies and digital platforms trying to remake cities, casts them as an obstacles for “regulatory entrepreneurs” (Pollman and Barry 2017) to overcome by either ignoring, undermining, or changing the existing planning rules in particular cities (Ferreri and Sanyal 2018; Gurran and Sadowski 2019). On the other end, the companies themselves attempt to usurp the role of public planners by enacting private governance over urban space, as we can see in the case of Sidewalk Labs' ongoing controversial development in Toronto (Goodman and Powles 2019).

We do not mean to discredit these arguments, which provide essential critical analyses of specific smart city projects, but rather we argue that there are other cases where government planners (and planning) have a more active role in leading initiatives. This goes beyond acknowledging that data-driven technologies are changing how city planners do their jobs (Batty 2013; Kitchin 2014; Heaphy 2019); it also requires us to put ourselves in their position, to understand their perspective, in much the same way that scholars have been adept at doing for corporations.

Seeing like a smart city planner, or at least attempting to do so, was a key motivation for the ethnographic study of the Future City Unit (FCU) in Parramatta. In our time studying the FCU and analysing the empirical data, it became clear that there were a few underlying principles that informed their outlook on how to prioritise, plan, and put into practice smart initiatives: local autonomy, vendor agnosticism, and problem-oriented approach. To be sure, these aren't the only principles influencing the FCU, but they were consistent and explicit throughout the interviews conducted and meetings observed; they guided Parramatta's smart city strategies and decisions. Additionally, these principles are interconnected, reinforcing, and coherent in a way

that could be seen as a synergistic framework for planning smart cities. This section will explore the planner centric mode by describing what each principle means in this context.

First, both politicians and planners in the city government view maintaining local autonomy as a necessity. This means preserving the ability to define what smart urbanism means for Parramatta, why these initiatives are pursued, and how they are operationalised—rather than handing over the reins to a third-party, such as a technology company or consultant. As a senior strategic planner in Parramatta stated, “We have to be very careful that our smart city experience is one which is leveraging off where we have the most influence, either direct control or significant influence, about the outcome. So, therefore, some of the stuff that we need to focus on is not really big scale stuff. Some of the stuff will be more localised and more precise” (interview, Parramatta director of city strategy, July 2018).

However, planners also value local autonomy, turning it into a virtue to be preserved, because the more high-profile pathway that other cities have taken—namely, major partnerships with global corporations—was simply not available to Parramatta. The planner went on to explain, “We represent a community of just under 300,000 people, so we don't have a big budget. In fact, our smart city team has virtually no budget. Sometimes we beg, borrow and steal funding from different sources. So, we can't rely on someone else solving the problem. We have to be very clear about the strategy and the things that we can and can't do, and focus on the things that will make a big difference” (interview, Parramatta director of city strategy, July 2018). Thus, in a case of constraint forcing creativity—or, constraint forcing municipal control—a planner centric mode is defined by considering decision-making about how to deploy scarce resources in ways that maximise benefits for the city and community. Indeed, the FCU, a small team of only a few full-time staff plus a couple paid student interns, managed a large portfolio of projects and punched above its weight. It became a kind of inside joke that the FCU was more like a ragtag team of misfits because not only did they have quite different backgrounds and dispositions, most of them had never really heard of, let alone worked on, “smart cities” before joining the FCU.

Second, following from local autonomy is an adherence to vendor agnosticism. In other words, there was a strong aversion to the city government getting locked into ongoing contracts for services or products from one single company. This emerges from a need to remain flexible and find the right vendor who can most effectively, both in terms of outcomes and costs, help the city address specific issues. Moreover, agnosticism is a tactic for avoiding solutionism and upselling—that is, the tendency for technology companies to create problems for the purpose of selling solutions. Multiple planners espoused their annoyance at, as they called it, “digital bling.” By which they meant the way companies would pitch the government entire ecosystems of software and hardware—or, would respond to their Call for Proposals with large-scale, expensive projects—rather than simply provide the single service or product that they needed to solve a discrete issue. This idiosyncratic term, “digital bling,” for a common problem represents a shared sensibility and language among the planners.

Once again, the principle of vendor agnosticism also emerges from constraints in the city government. In this case, the procurement system requires fair evaluation of

potential vendors and clear justifications for decisions about contracting services. The requirements for procurement can prevent the FCU from moving fast and experimenting with unproven technology. As one city councillor for Parramatta put it, “The appetite for risk is also higher in the private sector. The appetite for risk is not so high in the government. You don't want to—you can't—be seen as if you have failed” (interview, Parramatta councillor, October 2018). This attitude could slow down innovation, worried the councillor, but it also means the planners tend to work with smaller companies and rely on their own ingenuity, rather than outsource these capacities and decisions to a private partner.

Third, as we saw in relation to the previous principles, the smart city planners are guided by a problem-oriented approach. This outlook isn't just about the initiatives being led by government in general, rather it is closely linked to this way of doing smart urbanism being situated within strategic planning. As the head of FCU explained, smart urbanism in Parramatta “got moved to strategy [department] and renamed as Future City [because] they wanted us to think about the challenges of the future, not from a technology point of view and not from a marketing point of view, but from a services point of view and align that to strategy so we were thinking beyond the curve of the current challenges” (interview, FCU head, July 2019). Here the informant is alluding to the three phases of Parramatta's smart city development that we outlined earlier. Each phase had distinctive perspectives and priorities that guided their orientation toward smart urbanism. A “services point of view” refers here to their mandate to provide services for the people of Parramatta—these are the city government's “customers,” as they are called, whose needs must be met.

While the government adopts corporate language in how it describes its own organisation and activities, the problem-oriented approach is also self-reflexively a way of staving off the undue influence of those looking to get a piece of the lucrative market in smart city products. The lure of “digital bling” is suppressed by a focus on solving problems and serving people. As one planner said, “We could have a 10-kilometre queue outside the building of people wanting to sell us some sort of new and great technology. But what does it really do? [They might respond] ‘Well, it doesn't really do anything, but it's interesting.’ [We are] changing that to be about, ‘Well, what are the things we could do that would change people's lives?’” (interview, Parramatta planner, July 2018).

5. Conclusion

There are many ways to build a smart city. Here we have identified and discussed three common modes in which smart cities are materialising. First is the corporate centric mode wherein the visions, solutions, and services sold by (major) technology vendors dictate how the smart city is constructed and operated. We illustrate this mode—which has largely dominated the attention of scholars and journalists—through a case study of the Sunshine Coast Council. Second is the citizen centric mode wherein public participation and/or community values are held up as essential features of building and maintaining a smart city. We illustrate this mode—which many cities aspire to create, to varying degrees of success—through a case study of Newcastle. Third is the planner centric mode wherein the methods and aims of professional strategic planners guide the design and implementation of smart

initiatives. We illustrate this mode—which tends to operate unseen in the background of urban governance—through a case study of Parramatta.

There is extensive literature on the development of smart cities, whether picking from off-the-shelf-products or pushing back against one-size-fits-all models, with growing awareness that smart solutions and services must be tailored to a city's specific needs and contexts. But as the case studies above reveal, the smart city is also a mix of private and public interests which are constrained, rearticulated, and shaped by geography, internal politics, systems of governance, and community engagement or activism. Inevitably, through this process the needs, values, and goals of some stakeholders are reflected over others in how (smart) cities are made. We have explored some of these different processes and possibilities as they have been emerging in different Australian cities and regions.

There are more modes of making smart cities than the three we describe here. Our tripartite analysis is only meant to be the beginning of a larger framework of modes and catalogue of case studies. For example, another mode worth studying further is driven by property developers building smart precincts. This particular mode is taking shape as one wherein smart urbanism is subordinated and subsumed into the accumulation of capital by property developers. We have observed its emergence, to varying degrees, in our field sites. Specifically, with regards to the ongoing \$2.7 billion redevelopment of Parramatta Square in the city's CBD. Becoming known as a world-class smart place is at the forefront of this major project, which is expected to be complete in 2022. According to the glossy concept designs on display around the construction site, Parramatta Square's new towers, council chambers, and public square will all be integrated with various digital technologies meant to attract business, engage visitors, and govern space. All of which will, if all goes according to plan, drastically increase the value and reputation of Parramatta's CBD. We don't include a full analysis of this mode or case study above because we have only observed this project—and other notable cases such as precincts in Sydney, Melbourne, and Brisbane—from the outside as members of the public. The property developers, in our experience, tend to ignore contact and restrict access. If anything, that means empirical research about this mode—and about these secretive and powerful interests—is even more necessary. We hope this mode, and the many others that constitute the practices of variegated smart urbanism around the world, will be the subject of future research.

Studying the processes of smart urbanism is another way of studying the practices of city building. Yet, even critical scholars can forget this basic but important fact. Perhaps we get distracted by the new technical systems and the techno-solutionism rhetoric, or by the people and companies involved in major smart city projects who often don't have traditional urbanist pedigrees. Whatever the reason, we have to be careful not to forget everything we already know about why and how urban places are planned, built, governed, and lived in. If our case studies show anything, it's that not even the smartest city can disrupt the ways in which a place's historical, social, spatial, and material context establishes the conditions for what is, and can be, made next.

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- Provides empirical case studies of three Australian cities describing three different modes of making smart cities: corporate-centric, citizen-centric, and planner-centric.
- Contributes to analysis of the variegated ways that smart urbanism is actually planned and implemented.
- Highlights the ways in which a place's already existing material, social, spatial, and political context shapes the way smart initiatives and strategies are enacted.