

PLANNING FOR THE DIGITAL FUTURE: GROWING AND GOVERNING THE (SMART) CITY

Dr Lucy Cradduck

Faculty of Law, Queensland University of Technology (QUT)

ABSTRACT

Australia is on the verge of significant transformations in its urban environments. As urban populations grow this will lead to an increased demand for better service provision, which in turn will lead to an increased demand for (and use of) better technologies. Governments in particular are looking to technology-driven solutions to enable the cost-effective provision of essential services. In response to challenges arising from the expansion of the global digital economy, the Australian federal government is preparing to support its urban and regional cities by means of the implementation of the *Smart Cities Plan*. The plan seeks to maximise new and emerging technologies in order to improve sustainability and to drive innovation.

Increased technology distribution and use within urban environments will provide a variety of benefits. It will enable the more effective and seamless delivery of essential services; as well as providing an increased level of connection and participation by persons with disabilities. However, the ability to use this technology will require the establishment of appropriate infrastructure; as well as policies and laws to address access to that infrastructure and to protect against risks to individuals. In particular, as the use of interoperable technological devices grows, so does the capacity for these devices to enable the capturing and sharing of personal data.

How effective current planning and land laws, and existing governance arrangements, will be in enabling the creation of *smart cities* and in supporting their residents in the future require further review. It also will require coordination across three levels of government as, currently, access to the internet and the technologies required to enable *smart cities* primarily is regulated under the federal telecommunications power; while land (generally) is regulated by the States/territories under similar but not identical legislation; and communities by local government laws. In this context, this paper considers the federal government's proposed *Smart Cities Plan*. In so doing it identifies matters required to be included in any future policy framework in order to support Australian cities as they transition to their *smart* future.

Keywords: Digital inclusion, NBN, digital economy, smart city, telecommunications

INTRODUCTION

In the nine years since Australia's commitment, as one of many signatories, to "*promote ubiquitous access to ICT networks and services enabling widespread participation in the Internet Economy*" (OECD, 2008, p.6), international investment by governments in enabling participation is increasing. In the urban environment, this is seen in the increasing support and involvement by government; industry and business in establishing what are referred to as *smart cities* (Cocchia, 2014). A variety of technology-driven solutions is enabling the cost-effective provision of essential services by governments and businesses to individuals (Cradduck, 2015). These and similar solutions also are fundamental to the successful implementation of *smart city* frameworks. In order to support its urban areas, and in response to the ongoing challenges arising from the expansion of the global digital economy, the Australian federal government is in the process of implementing its *Smart Cities Plan*, which seeks to maximise new and emerging technologies in order to improve sustainability and to drive innovation (DPMC, 2016).

This support is timely as Australia's growing population will lead to increased urbanisation, both by migration to existing cities and increased urban sprawl. Improved telecommunications provision, facilitated by the ongoing roll-out of the NBN (and other high speed broadband networks) and mobile infrastructures, will see rural and regional population bases become more significant as their citizens, no longer needing to commute for work or education; will remain more engaged within their local communities (Cradduck, 2015). These expanding communities will need appropriate frameworks to be established, in new areas and retrofitted in existing areas, to support their residents in the digital economy.

However, how effective current policies, laws, and existing governance arrangements, will be in enabling the creation of *smart cities* and in supporting their residents into the future requires review. Establishing effective *smart city* frameworks will require coordination across three levels of government as, currently, access to the internet and the technologies required to enable *smart cities* primarily is regulated under the federal telecommunications power; while land use (generally) is regulated by the States/territories under similar but not identical legislation; and communities by local government laws. Land planning also primarily is the reserve of State and territory governments.

This paper commences that further review. It begins by providing an oversight of the digital context for *smart cities*. It then identifies and considers relevant governance issues before overviewing the federal government's proposed (and very newly introduced) *Smart Cities Plan*. In doing so it identifies matters that the federal government should include in its future policy framework in order to support Australian cities as they transition to their *smart* future.

THE DIGITAL CONTEXT

The *smart city* discourse has moved beyond mere characterisation (Giffinger et al., 2007), to what is necessary to create a *smart city*. While not uniformly defined (Edwards, 2016; Cocchia, 2014; Cavada et al., 2014), a smart city commonly is one created by adopting an integrated information and communications technology ('ICT') framework, which enables residents to be engaged with the internet and each other and that supports the effective delivery of essential services to individuals and businesses by government and business (Caragliu et al., 2009). The term also is used as a "*branding and marketing concept*", although this is done more often without consideration of the need to ensure the actual interoperability of a city's residents with the ICT available for their use (Vestergaard, 2016, p.39).

An effective *smart city* framework provides a range of financial, environmental, (Cavada et al., 2015) and health (Cocchia, 2014) benefits and addresses complex transportation issues. Core to this is the use of integrated ICT networks enabled by means of access to internet technologies. Internet access provides a unique gateway to services and information (Chin, 2000), and a seamless way of living via the physical and social networks it enables (Kariyawasm, 2007) and by integrating ICT networks (Caragliu et al., 2015; Lee et al., 2014). Simply - a smart city is one in which your use of technologies and services is integrated in such a manner that both enables and supports your existence in it. Establishing a *smart city* framework will require a cohesive approach, which includes input from all stakeholders in order for the city to "*function as a smart collaborative ecosystem, empowered by the highest level of technology development*" (Popescu, 2015, p.80).

The internet and related technologies brings with them the potential for extraordinary efficiencies and cost-savings in the provision of a city's essential services through a *smart city* framework. However, it also introduces a range of new threats and risks caused by the ability of technology to be used for surveillance and control (Shaw, 2015). This means there is an ongoing need to ensure personal data and privacy is protected (Maras, 2015). Members of expanding city communities will increasingly expect local government authorities ('LGAs') to ensure appropriate governance frameworks are put in place to support and protect residents from the risks associated with their technology uses. However, within Australia the ability of existing public policies and laws to allow LGAs to properly protect individual privacy and security is questionable – internet access is regulated under the federal telecommunications power; land (generally) by the States under similar but not identical legislation; and communities by local laws. While it may be practical to seek industry input and participation for technology driven solutions, commentators and scholars are becoming increasingly critical of any purely industry-lead vision of governance for our *smart cities*.

Most importantly, in order to be effective, any *smart city* policy framework must work in practice (Angelidou, 2014; Howkins, 2009; Edwards, 2001). Any framework must be sufficiently flexible and yet sufficiently prescriptive in order to support established *smart cities* as well as enabling other cities to aspire to, and to achieve, their own *smartness*. What will be the appropriate solution will depend to a large extent upon the city itself. As Macomber (2016) observes, "[t]he messy truth is that cities are not the same, and even the most innovative approach can never achieve universal impact" (Macomber, 2016, p.1).

Ultimately, determining the effectiveness of any *smart city* framework is only something that can be done over time. In the meantime the need to ensure the ongoing liveability of these cities raises a number of governance issues that must be identified and addressed separately from any consideration of what is necessary to create a smart framework in the first place. This is required both in order to grow more *smart cities* and to ensure their effective governance in their digital future.

GOVERNANCE ISSUES

As Australia moves closer to ubiquitous high-speed broadband and as the use of mobile electronic devices increases, the desire, need and opportunities for seamless integration of ICT and service delivery grows (Kariyawasm, 2007). Globally, there is increasing support for the adoption of *smart city* frameworks (Edwards, 2016; Zubizarreta et al., 2016; Bakier et al., 2013). Concurrently the ever evolving nature of the ‘internet of things’ brings with it new social, economic and regulatory challenges (Schulz & Dankert, 2016). It is submitted that within Australia the ability of existing public policies and to effectively operate in this environment is questionable.

Implementation of an Australia-wide framework will require an integrated approach. Hierarchically, it will require coordination over three levels of government. Horizontally, it will require input from the various stakeholders, including government officials, within each community. Data creation, use and sharing, plays a vital role in digital engagements. However, while industry has a clear role in policy development (Howkins, 2009; Bridgman & Davis, 2003); the propensity for technology to be used for surveillance and control (Richards, 2013), privacy concerns (Edwards, 2016) and personal safety issues (Vestergaard, 2016); means development of an Australia-wide framework should not be left to market forces.

Public policy making has become an increasingly complex and complicated process, exacerbated by the impact of the internet and technology on business and social life (Pohle, Hösl, & Kniep, 2016). Matters requiring specific and ongoing attention include privacy and data security for individuals, businesses and government (Almeida et al., 2015); digital inclusion (including literacy); data ownership; and effective market functioning. There is a need also to ensure integration with existing infrastructure and to address issues of governance of the framework once completed (Althaus, 2013). Other challenges arise regarding individuals who, although with capacity, elect not to engage (Calzada & Cobo, 2015). Matters are complicated by the differing perspectives and responsibilities from one country to the next and exacerbated further by the ever growing digital divide that threatens to leave many behind (Cradduck, 2015) as well as threatening personal and public security.

The appropriate governance of the digital economy and its component parts, including *smart cities*, therefore is the role of government (Cradduck, 2015). A reconsideration of the role of public policy and the States, territories, LGAs and federal government thus is vital, noting, however, there is not one solution as to what is an appropriate policy framework (Zubizarreta et al., 2016). Most importantly, any policy framework must work in practice (Angelidou, 2014; Howkins, 2009; Edwards, 2001). As the Victorian State Government recently identified (2016) the first step towards any new planning regime is education of those tasked with the obligation of oversight and enforcement. Concurrently this will require upskilling those in industry, and it is suggested the consumer’s they service. Regretfully, Victoria places consumer education as the last step not the first in their draft apartment design standards (Victoria, 2016, 9)¹.

Successful implementation of any *smart city* framework will be achieved more easily in greenfield areas, without the constraints of dealing with existing infrastructure and systems (Angelidou, 2014). Nonetheless, by necessity, this framework will need to be retrofitted into existing cities (Edwards, 2016). Also while ICT infrastructure is more effectively established within a considered urban planning environment (Bakier et al., 2013) and within locations close to established urban areas (Macomber, 2016), it also will be necessary to manage and establish infrastructure in non-urban areas (Cradduck, 2015). Noting that appropriate land planning will be of particular importance for new developments (Hawkins, 2014), a variety of matters will need to be incorporated in any future framework for both established and new *smart cities*.

From a planning perspective, appropriate frameworks are those that will support and enable the social, economic and environmental sustainability of Australia as a whole; and of each city and region individually. As “*legislation is now the principal expression of policy in legal form*” (Farrar, 2010, p. 134) the challenge for policy makers and legislative draftsmen is to work together is to develop “*a proposed rule ... general enough to cover all foreseeable instances ... [but with] sufficient detail to ensure ... its meaning is clear*” (Farrar 2010, p.137). That is policies, laws and practice must be implemented bearing in mind that what is necessary is to a large extent dependent upon as yet unknown technologies.

¹ Public consultation on the draft standards closed on 19th September 2016. The current timeframe has the final standards being introduced in December 2016, however, to date these appear unavailable.

THE SMART CITIES PLAN

Most recently the federal government presented its *Smart Cities Plan*, which in part identifies that the federal government will seek to engage with all levels of government to achieve its implementation (DPMC, 2016). In that plan, the federal government proposes both to establish *smart cities* and to support their citizens into the future (DPMC, 2016). The *Smart Cities Plan* proposes a three pillared approach consisting of *smart investment*, *smart policy* and *smart technology*. The first pillar – *smart investment* – includes a commitment to project planning with a \$50 million committed to “major transformation infrastructure projects”. (DPMC, 2016, p.18) Subsequently, the federal government announced it is “*establishing a competitive Smart Cities and Suburbs Program worth \$50 million ... to fast-track innovative technology solutions that improve long-standing urban problems*” (DPMC, 2016a)². Round tables, facilitated by the Cities Division, Department of the Prime Minister and Cabinet, sought feedback on projects to support LGAs to overcome their problems

Implementation the *Smart Cities Plan*, however, will not guarantee digital improvements throughout Australia. This is because the plan, unfortunately, commences by defining the areas it will benefit by means of exclusion. This is done by clearly stating “[s]o when we talk about Australians cities, we mean both metropolitan and regional” (DPMC, 2016, p.6). It is submitted that this position is inappropriately limiting as it focuses attention away from those areas in greatest need of government support in order to ensure that appropriate physical and technological infrastructures are constructed/provided for their residents (Craddock, 2015). As highlighted by the *Macquarie Park Case Study* (DPMC, 2016, p.10) the need for at least a minimum level of access to the essential infrastructure found more commonly in urban areas, is vital for Australia’s future economic growth. It also is vital for its social development (Gregory, 2015).

The second pillar – *smart policy* – includes a commitment to “*leading regulatory reform*” (DPMC, 2016, p. 23). This identifies a variety of potential areas for reform, including reducing “*development assessment processing time and inconsistencies*”. It fails to identify, however, ensuring consistency of the various State, territory and LGA laws and bylaws will be progressed. While focussing on the third pillar – *smart technology* – is perhaps a more interesting option (DPMC, 2016, p.26), as noted above unthinking use of technology and or an unskilled population will only exacerbate current problems for privacy and security.

Interest in participating in the *Smart Cities and Suburbs Program* round tables was strong resulting in further sessions scheduled to accommodate all desiring to participate³. Regretfully, the draft Program Guidelines have technological solutions as a clear focus, albeit with the objective of making cities more liveable (DPMC, 2016b). Separately, the government’s preliminary response to submission to the *Smart Cities Plan* identifies several initiatives, including establishing a reference group to assist in strengthening “engagement in cities policy” (DPMC, 2016c, p.2), however, these are only to commence during 2017. Progressing the *Smart Cities Plan* therefore is very much a *work in progress* and measuring its affect therefore needs to be left to the future.

CONCLUSION

As Zubizarreta et al., (2016) note there is not *one* solution to what is an appropriate smart framework. The governance of *smart cities* and their essential service necessarily will involve balancing a range of political, technological, societal and economic drivers. Transitioning to an appropriate governance framework will require support from LGAs; community and industry stakeholders; regulatory bodies and individuals as consumers. Against this is balanced the increasing criticism of purely industry- created governance models. The federal government therefore will need to keep its finger on Australia’s pulse well into our future.

As Australia has progressed beyond the minimum level of infrastructure to enable internet access, it now must look to adopt “*policies and strategies ... which make the Internet widely available, accessible and affordable for all*” (Tully, 2014, p.185). Importantly, any strategies also must work in practice (Angelidou, 2014). However, the effectiveness of the *Smart Cities Plan* will only be measured after testing over time (Althaus et al., 2013). The success of the *Smart Cities and Suburbs Program* round tables in shaping the current policy debate also will not be known for some while. Meanwhile we wait, and wait, and ...

² This is consistent with the Coalition’s Policy for Smart Cities released in June 2016, in which the (now re-elected) government committed to “*work to ensure our cities are more liveable, more productive, and more prosperous.*” (p.5)

³ These were held in Melbourne on 14 September; Adelaide on 15 September; Perth on 16 September; Sydney on 19 September; Rockhampton on 22 September and Brisbane on 23 September.

REFERENCES

- Almeida, V., Doneda, D. & Monteiro, M. (2015). Governance Challenges for the Internet of Things. *IEEE Internet Computing*, 10(2), 56–59.
- Althaus C., Bridgman, P. & Davis, G. (2013). *Australian Policy Handbook*, 5th ed. Crows Nest: Allen & Unwin.
- Angelidou, M. (2014). Smart city policies: A spatial approach, *Cities*, 41, S3–S11.
- Bakier, T., Almirall, E., & Wareham, J. (2013). A Smart City Initiative: The Case of Barcelona, *J Know Economy*. 4(2), 135–148.
- Bridgman, P. & Davis, G. (2003). What Use is a Policy Cycle? Plenty, if the Aim is Clear', *Aust J Public Administration*, 62 (3), 98.
- Calzada, I., & Cobo, C. (2015). Unplugging: Deconstructing the Smart City. *Journal of Urban Technology*, 22(1), 23–43.
- Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart Cities in Europe, *Journal of Urban Technology*, 18(2), 65–82.
- Cavada, M., Hunt, D., & Rogers, C. (2014). Smart Cities: Contradicting Definitions and Unclear Measures. In *4th World Sustainability Forum*, 1–30 November 2014 (DOI: 10.13140/2.1.1756.5120)
- Cavada, M., Hunt, D., & Rogers, C., (2015). Do smart cities realise their potential for lower carbon dioxide emissions? In *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* (DOI: <http://dx.doi.org/10.1680/jensu.15.00032>)
- Chin, G. (2000). Technological Change and the Australian Constitution, *Melbourne University Law Review* 25, 7.
- Cocchia, A. (2014). “Smart and Digital City: A Systematic Literature Review”. In R. Dameri & C. Rosenthal-Sabroux (Eds) *Smart City, Progress in IS*, Switzerland: Springer International Publishing.
- Craddock, L. (2015). *Individuals, Innovation and the Internet: Why access is essential*, Champaign, IL: Common Ground Publishing.
- Craddock, L. (2016). Rolling out the future: The current status of the Australian NBN and its impact for property. In *22nd Annual Pacific Rim Real Estate Society Conference*, 17-20 January 2016, Sunshine Coast.
- Craddock, L. (2011). The future of the internet economy: Addressing challenges facing the implementation of the Australian National Broadband Network. *Professional Doctorate thesis*. QUT.
- Department of Prime Minister and Cabinet (‘DPMC’). (2016). *Smart Cities Plan*. 29 April 2016 <https://cities.dPMC.gov.au/smart-cities-plan> (accessed 27/07/2016)
- Department of Prime Minister and Cabinet (‘DPMC’). (2016a). *Smart Cities and Suburbs Program*. <https://cities.dPMC.gov.au/smart-cities-program> (accessed 14/09/2016)
- Department of Prime Minister and Cabinet (‘DPMC’). (2016b). *Smart Cities and Suburbs Program – Round 1, Draft Guidelines*, 13 December 2016 <https://cities.dPMC.gov.au/smart-cities-program/documents> (accessed 06/01/2017)
- Department of Prime Minister and Cabinet (‘DPMC’). (2016c). *Smart Cities Plan: Submission Report*, December 2016 <https://cities.dPMC.gov.au/smart-cities-plan/documents/48094/download> (accessed 06/02/2017)
- Edwards, L. (2016). Privacy, Security and Data Protection in Smart Cities: A Critical EU Law Perspective. *European Data Protection Law Review* (Lexion) Forthcoming. <http://dx.doi.org/10.2139/ssrn.2711290>
- Edwards, M. (2001). *Social Policy, Public Policy: From problem to practice*, Crows Nest: Allen & Unwin.
- Farrar J. (2010) *Legal Reasoning*, Sydney, Thomson Reuters.
- Giffinger, R., Fertner, C., Kramar, H., Pichler-Milanovic, N., & Meijers, E. (2007). *Smart cities: Ranking of European medium-sized cities*, Report Centre of Regional Science, Vienna UT, October 2007, http://www.smart-cities.eu/download/smart_cities_final_report.pdf.
- Gregory, M. (2015) The Rationale for Universal Access to Digital Services, *Aust J Telecom and the Digital Economy*, 3(4), 166–184.
- Hawkins, C. (2014). Planning and competing interests: testing the mediating influence of planning capacity on smart growth population adoption, *Journal of Environmental Planning and Management*, 57(11), 1683–1703.
- Howkins, J. (2009). *Creative Ecologies: Where Thinking is a Proper Job*, St Lucia: University of Queensland Press.
- Kariyawasm, R. (2007). *International Economic Law and the Digital Divide: A New Silk Road*, Cheltenham: Edward Elgar.
- Lee, J., Hancock, M., & Hu, M. (2014). Towards an effective framework for building smart cities: Lessons from Seoul and San Francisco, *Technological Forecasting & Social Change*, 89, 80–99.
- Macomber, J. (2016) The 4 Types of Cities and How to Prepare Them for the Future, *Harvard Business Review*, Digital Article, January 18, 2016. <https://hbr.org/2016/01/the-4-types-of-cities-and-how-to-prepare-them-for-the-future> (accessed 19/05/2016)
- Maras, M. (2015). Internet of Things: security and privacy implications, *International Data Privacy Law*, 5(2), 99–104.
- OECD, ‘The Seoul Declaration for the Future of the internet Economy’ OECD Ministerial Meeting on the Future of the internet Economy, Seoul, Korea, 17-18 June 2008, <http://www.oecd.org/dataoecd/49/28/40839436.pdf> (viewed 16/01/2010)
- Pohle, J., Hösl, M. & Kniep, R. (2016). Analysing internet policy as a field of struggle. *Internet Policy Review*, 5(3). DOI: 10.14763/2016.3.412
- Popescu, G. (2015). The economic value of smart city technology. *Economics, Management, and Financial Markets*, 10(4), 76–82.
- Richards, N. (2013). The Dangers of Surveillance, *Harvard Law Review*. 126(7), 1934–1964.
- Schulz, W. & Dankert, K. (2016). ‘Governance by things’ as a challenge to regulation by law. *Internet Policy Review*. (5)2. DOI: 10.14763/2016.2.409.
- Shaw, J. (2015). From *homo economicus* to *homo roboticus*: an exploration of the transformative impact of the technological imaginary. *International Journal of Law in Context*, 11(3), 245–264.
- Tully, S. (2014). A Human Right to Access the Internet? Problems and Prospects. *Human Rights Law Review* 14, 175–195.
- Vestergaard, L., Fernandes, J., & Presser, M. (2016). Towards smart city democracy. *Geoforum Perspektiv*, 14(25), 38–43. doi:<http://dx.doi.org/10.5278/ojs.perspektiv.v14i25.1294>.
- Victorian State Government (2016) *Better Apartments Draft Design Standards*, Department of Environment, Land, Water and Planning, August 2016.
- Watson, A. (1974). *Legal Transplants: An Approach to Comparative Law*. 2nd ed. The University of Georgia Press.
- Zubizarreta, I., Seravalli, Al. & Arizabalaga, S. (2016). Smart City Concept: What It Is and What It Should Be, *Journal of Urban Planning Development*, 142(1), [http://dx.doi.org/10.1061/\(ASCE\)UP.1943-5444.0000282](http://dx.doi.org/10.1061/(ASCE)UP.1943-5444.0000282).

Email contact: l.craddock@qut.edu.au