
RESEARCH ARTICLE

Digital Cartography Enterprise: Neoliberalism, Governmentality and Digital Infrastructure

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The Gigatown competition (2013–2015) was a joint initiative between the telecommunications company Chorus and the New Zealand government to award a New Zealand town ‘the fastest internet in the Southern Hemisphere’ through a social media competition. In this paper, I argue the competition stimulated a range of activities that cohere with creative and smart city policies, the growth of information and communications technology (ICT) and immaterial labour, and the participatory turn in urban governance and planning. In its attempt to remake city-space as receptive for an imagined ICT future, the competition exemplifies what I call a Digital Cartography Enterprise. This term captures both the neoliberal and post-industrial spatial rationalities of urban planning and policy with respect to securing ICT-readiness as well as the governmentalised disciplining of the population to creatively subsidise such a venture through appeals to their entrepreneurialism in a social media competition.

Keywords: digital infrastructure; governmentality; neoliberalism; competition; urban planning; social media

Introduction

The Gigatown competition (2013–2015) was a joint initiative between the telecommunications company Chorus and the New Zealand government to award a New Zealand town ‘the fastest internet in the Southern Hemisphere’ through a social media competition. I argue that the actuarial logic of the competition aims to stimulate a range of activities that cohere with corporate and government policies on creative and smart cities, the growth of information and communications technology (ICT) and immaterial labour as it effects both business and public sectors such as education and health, the regulation of social media consumption, and the participatory turn in urban governance and planning. In its attempt to remake city-space as receptive for an imagined ICT future, the competition exemplifies what I call a Digital Cartography Enterprise. This term captures both the neoliberal and post-industrial spatial rationalities of urban planning and policy with respect to securing ICT-readiness as

well as the governmentalised disciplining of the population to creatively subsidise such a venture through appeals to their entrepreneurialism in a social media competition.

The research presented in this paper is drawn from a University of Otago Research Grant: *Competing Futures: Community Building and the Gigatown Competition in the South Island*. This project collated policy documents, media reporting, promotional material, Gigatown website and social media content, and through interviews, community and participant views of the Gigatown competition (2013–2016). South Island towns and in particular, Dunedin, formed the focus of the Gigatown materials collected. Fifteen interviews were conducted in total from the end of 2015 to the middle of 2016. Two interviewees were involved in Invercargill's Gigatown bid, three were from Chorus' marketing team, and the remainder were from Dunedin. The latter included personnel who managed the competition as part of the Digital Community Trust (known as the Digital Office), on behalf of the Dunedin City Council (DCC), as well as volunteers. Mahdis Azarmandi, Sarah Gallagher, and Lewis Rarm provided research assistance in the collation, coding, and summarisation of the project data. The project was driven by the following questions:

- (a) What are citizens' views regarding a competition as the policy mechanism through which telecommunications infrastructure might be implemented in their town?
- (b) What is the relationship between ideas of community and broadband futures in regional New Zealand towns?
- (c) What role do social media and digital infrastructure play in the cultural and creative development of cities and towns?

This paper primarily provides an answer to the latter question in the development of a theoretical framework, Digital Cartography Enterprise, to understand the spatial and governing rationalities of urban planning with respect to ICT.

There are many avenues through which to explore the competition in terms of communication infrastructure and power relations. I want to focus on three in relation to infrastructural security: (1) explaining why the competition was desirable from the perspective of the former National government and ICT companies; (2) explaining the tenacious South Island participation as exemplifying post-industrial spatial rationalities for urban planning, and (3) conceptualising the materialisation of Dunedin's win in the competition and its plans for digital infrastructure in terms of a Digital Cartography Enterprise.

To address (1), I provide an overview of the competition before explaining the contextual factors that led the New Zealand government and the telecommunications company Chorus to create a year-long marketing scheme to promote ultra-fast broadband (UFB). In doing so, I explain how telecommunications policy in New Zealand exemplifies a localised response to global neoliberal market economies. The sections addressing (2), explicate Gigatown as a governmentalising endeavour that stimulated smart and creative urban planning. These urban planning solutions for industrial decline are particularly acute for South Island urban centres, who face competition for post-industrial professionals and digital infrastructure from the larger cities in the North. Finally, for 3), the paper considers how Dunedin's win in the competition was used by the Dunedin City Council (the DCC) to prioritise strategic areas of spatial importance marked for revitalisation and investment in the city. Because ICT's deterritorialising capacities carry the risk that work and consumption can take place anywhere, ICT infrastructural security paradoxically requires the importance of physically space-based industries. In a manner similar to settler colonial cartography, a Digital Cartography Enterprise partitions parts of the city as more valuable than others for economic growth but in a neoliberal spatial twist, devolves development risk onto consumer and resident uptake of ICT. I now provide an outline of the competition responsible for inciting these digital spatial projects.

The Gigatown competition

Gigatown was a joint initiative between the telecommunications company Chorus and the New Zealand government to award a New Zealand town Gigabit connectivity at wholesale prices (prior to other cities) and a \$200,000 development fund through a social media competition (see Chorus, n.d.[e]). It was run through social and online media where participants were invited to create content that would demonstrate the benefits of UFB for their town. Participating towns accrued points in various ways throughout the competition and could view their score on a live leader board, which indicated each town's position relative to others (see **Figure 1**). The winning town won the branding rights to the title 'Gig City', which promised significant national and international distinction for having infrastructure that could deliver fast internet speeds.

The competition was officially launched on 28 October, 2013 and concluded on 17 September 2014. At a gala function in Wellington, the former Communications Minister Amy Adams announced Dunedin as the winner of the competition on 26 November 2014. When it was launched, towns had to pre-register with Gigatown to compete and receive hashtags to indicate the production of official Gigatown content, for example, #gigatownqueenstown and #gigatownqtn for Queenstown. Content produced in the competition was displayed on both the main Gigatown website as well as the customised pages of participating towns (See **Figure 2**).

Towns accrued points based on the volume of social media content and traffic related to the competition and the ability to 'generate good discussions about how ultra-fast broadband and gigabit fibre can provide benefits for your town' (Chorus, n.d.[d]). Acceptable platforms for this content included: Facebook, Twitter, Instagram, YouTube, Flickr and blogs. Social media content comprised 25% of the total score determining the winner. The remainder comprised 6% for an Instagram selfie video, 6% for a finals quiz, 13% for supporter sign ups and 50% for producing a 'Plan for Gig Success'. The latter was required from the five

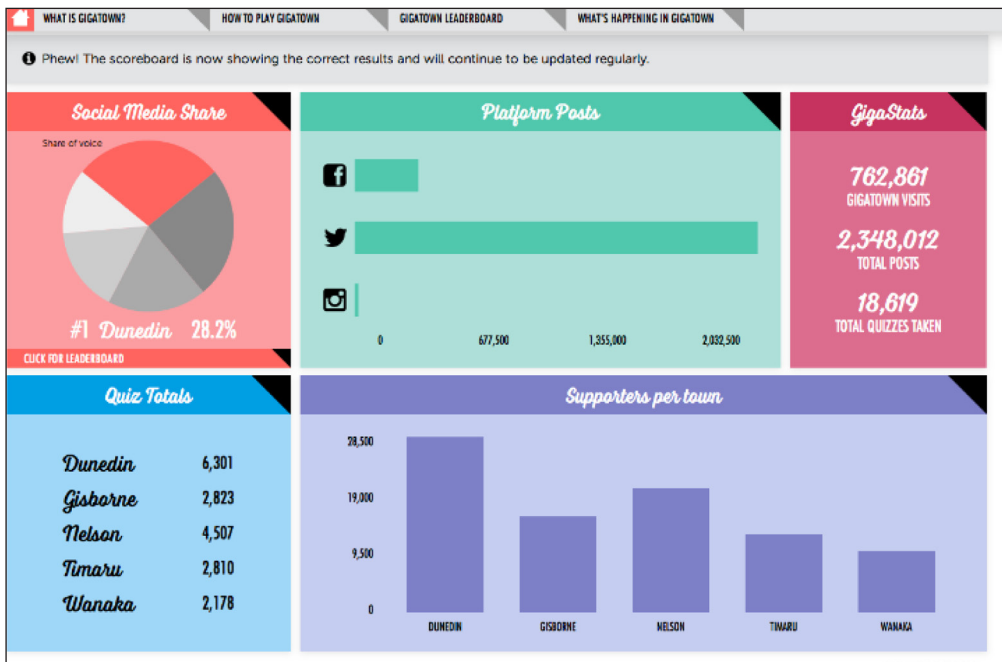


Figure 1: Screenshot of live Gigatown competition in process (7 November 2014) (<http://gigatown.co.nz/>).

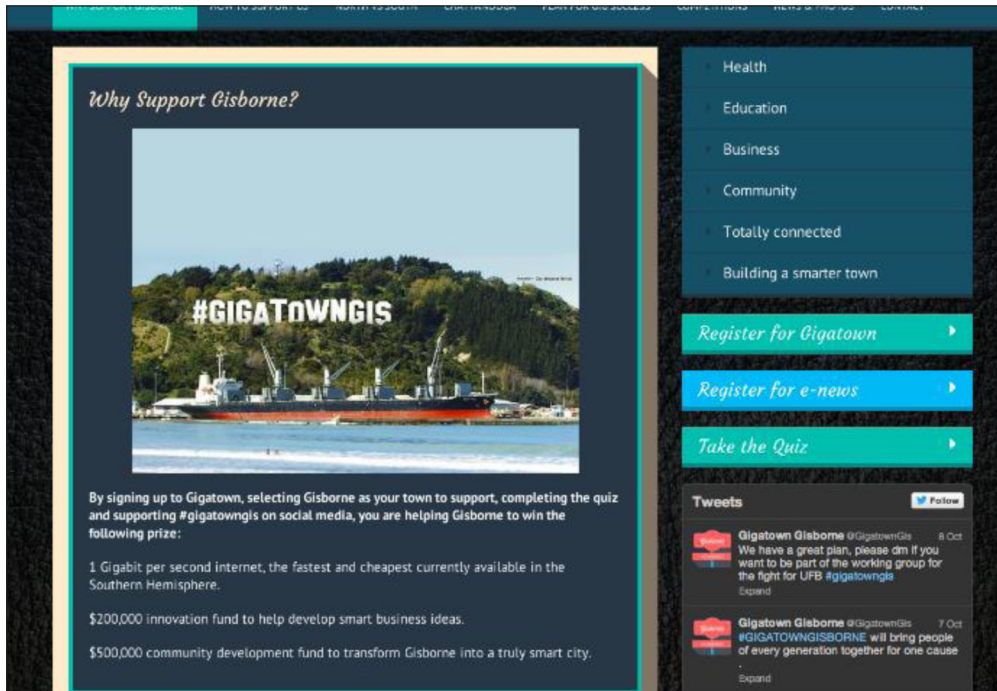


Figure 2: Screenshot of Gisbourne's Gigatown page with live tweets #gigatowngis (9 October 2014) (<http://gigatowngis.co.nz/>).

finalists: Gisborne, Dunedin, Wanaka, Timaru, and Nelson. The Plans were judged by 'a panel of influential Kiwis including Andy Hamilton, Cecilia Robinson, Rod Oram, Sam Johnson, Lillian Grace and Lorraine Menta' (StopPress, 2015) as well as the public (35% and 15% were proportionately accorded to these judging constituencies).

In order to incentivise continued participation and interest in the nearly year-long competition, Chorus introduced one-off competitions and special prizes, for instance the Gigaschools and Gigabusinesses contests where schools and businesses created videos outlining the benefits of ultra-fast broadband (UFB) to their respective fields. Two representatives from each of five finalists were also partially sponsored by Chorus to visit Chattanooga in Tennessee, United States. This city was promoted as benefiting from the early installation of fibre infrastructure and has one of the fastest internet speeds in the world (see Lanaria, 2015). The competition had significant local purchase for the smaller participating towns and their continued participation for over a year as well as sustained media interest, attests to the ingenuity of the competition's creators. Chorus won a prestigious advertising award and business and consumer adoption of UFB has generally proliferated (see StopPress, 2015; Ministry of Business, Innovation and Employment, 2016).

Because the competition awarded gigabit connectivity to 'the town with the loudest voice on social media' (Chorus, n.d.[c]), its ostensible aim to stimulate UFB growth across the country seemed simultaneously undermined by the competition's design to reward an already well-connected and socially media literate population. I will discuss how demography and size gave towns structural advantages in more detail in sections 2) and 3) in analysing Dunedin's win. It's worth noting here that the competition was not without criticism during its run. Public and media criticism suggested the competition encouraged wasteful spending (from the government, Chorus, and local municipalities) and there were accusations of

cheating and spamming, and technical misinformation. With respect to the latter, other locations had broadband access via fibre before the competition and internet service providers [ISPs] didn't sign on to deliver it until late in the competition. In other words, the winning Gigatown wasn't the 'first' to receive UFB in New Zealand (see *Otago Daily Times*, 2013; 3 News, 2014; Telfer, 2014). Regardless of marketing spin, the competition's main achievement was its ability to governmentalise digital infrastructural readiness, which I discuss next.

Governmentality and digital infrastructure

In this section, (1) I provide an economic and policy context to explain why the competition was initiated. Gigatown was the result of a promotional drive to both legitimate government subsidisation of fibre infrastructure as well as ensure its successful uptake by citizens/consumers.

Telecommunications in New Zealand

According to Dave Heatley and Bronwyn Howell (2010), New Zealand had been a world leader in broadband investment and innovation. They cite the country's early adoption of asymmetric digital subscriber line (ADSL) alongside a wide geographical coverage. Recently, the former National New Zealand government launched two schemes designed to improve digital infrastructure: the Ultra-Fast Broadband Initiative (UFBI) and the Rural Broadband Initiative (as of writing these schemes have been continued by the new Labour government). The former is achieved through the installation of fibre optic cables which dramatically increase internet speeds, up to 100Mbps (megabits per second) (Ministry of Business, Innovation, and Employment, 2017). Because it is not viewed as feasible to install fibre in rural areas, wireless broadband has instead been implemented to achieve 'peak speeds of at least 5Mbps' (Ministry of Business, Innovation, and Employment, 2015). The UFBI is clearly positioned as the spatial (and speedy) priority for the New Zealand economy reflective of the urban lens through which technological efficiency is conceived. In describing the UFBI, the New Zealand Ministry of Business, Innovation and Employment stated, 'The Internet has become part of the way New Zealanders live, learn and do business' (2017). Broadband capabilities have been positioned as central to the delivery of a range of community services, including health and education, in addition to their economic value for business and growth.

Chorus won the major contract for delivering the fibre that enables ISPs to provide UFB. The contract is worth \$929 million and they will deliver 70% of the network (McBeth, 2013). The company is a telecommunications and fibre optic infrastructure service that cannot sell directly to consumers, rather it provides services to other retailers. This means the winning city of Gigatown is effectively positioned as a 'wholesale' retailer in receipt of the prize, illustrative of the ways neoliberal urban planning rationalities encourage the transformation of public services and infrastructure according to market logics. Wendy Larner argues that the New Zealand version of neoliberalism is 'characterised by a 'partnering' ethos in both economic and social policy' where the early forms of deregulation, privatisation and marketisation of state services in the 1980s were also expressed through 'the welfarist and social justice aspirations associated with social democracy' (2003: 510). That is, the 'supranational project' of neoliberal globalisation, where the state's role is to direct its economic activities towards global market forces, also involves 'nation-state and local (particularly urban) political projects' (509). Gigatown can be understood then as exemplifying New Zealand neoliberalism insomuch as it incites and invites a participatory and localised response to global ICT economic demands as a civic and collective priority.

I will elaborate on this incitement to localisation in more detail below, but here I further contextualise the Gigatown competition within the shifting policy frameworks that enable

private-public digital infrastructures. Chorus was disaggregated from Telecom New Zealand after it was privatised and telecommunications became deregulated under the introduction of neoliberal economic policies in the late 1980s and early 1990s. Telecom New Zealand Limited was established to privatise telecommunications infrastructure through stimulating consumer demand, though because of its previous public ownership, the company had a near monopoly during its early operation. It was eventually bought by overseas companies. Chorus operated as a separate business to Telecom and then as its own company in the late zeros. It is now reported to be 45 percent overseas-owned (Pullar-Strecker, 2013) indicating how national public infrastructure policies create economic and information flows connected to a global market. Such multinational enterprises are not new in a national policy landscape but the ownership configuration of Chorus and the conditions under which it was contracted to deliver the fibre network can explain the impetus for a national marketing scheme premised on the localisation of UFB and its potential benefits to New Zealand towns and cities.

When Chorus won the contract to deliver fibre-to-the-home broadband, the government introduced a 'copper tax' which aligned 'price for [the existing] copper broadband connections with the cost of new fibre broadband connections' (Coalition for Fair Internet Pricing, n.d.). This inflated the costs of copper broadband connections in order to encourage consumers to take up fibre connected broadband. The Coalition for Fair Internet Pricing protested the move on behalf of consumers, stating 'more than 70% of New Zealand households will not be using the new fibre network in 2020, and 25% of households will never have access to it' (Coalition for Fair Internet Pricing, n.d.). The deregulation of fixed copper broadband pricing was reported to have made Chorus' acceptance of the fibre contract more economically feasible for them (see Bennett, 2016). The government's negotiation of the Chorus contract indicates how crucial consumer uptake of UFB was for the latter's economic viability, which generated some negative publicity regarding public policy being used to subsidise Chorus' operations in New Zealand (see Barton, 2013).

Gigatown competition as governmentalising urban infrastructure

The Gigatown competition was then a strategically useful publicity tool to both promote the benefits of UFB while also simultaneously devolving such promotion onto municipal authorities themselves, through the volunteered social media content created in the competition. Infrastructural interest in UFB is then seen to derive from local communities rather than external corporate and governmental pressures. I analyse the competition's effects, indeed its signal achievement, as constituting a form of governmentality. I use this term in the Foucauldian sense to mean the establishment of 'a continuity, in both an upwards and a downwards direction' (Foucault, 1991a: 91) of governing rationalities (such as directing economic activities towards global ICT-readiness) where tactics are employed 'to arrange things in such a way that, through a certain number of means, such and such ends may be achieved' (95). In providing a social media campaign through which municipal councils and civic-minded residents were stimulated (via the promise of eventual rewards) to volunteer information about the benefits of UFB, Gigatown was able to discursively mobilise business, city planning, modes of citizenship and digital consumption, and urban infrastructure as receptive to the adoption of UFB without 'direct' intervention from the National government or Chorus (see **Figure 3**). These governmentalised activities are necessary for both rationalising and securing the viability of broadband infrastructure.

In a report by the McKinsey Global Institute, available on the Chorus website, the authors note that 'Internet-related consumption and expenditure is now bigger than agriculture or energy' (Pélessi du Rausas et al., 2011: 2). The internet's economic benefits are attributable to a 'consumer surplus' where making use of an infrastructure supported by ICT industries

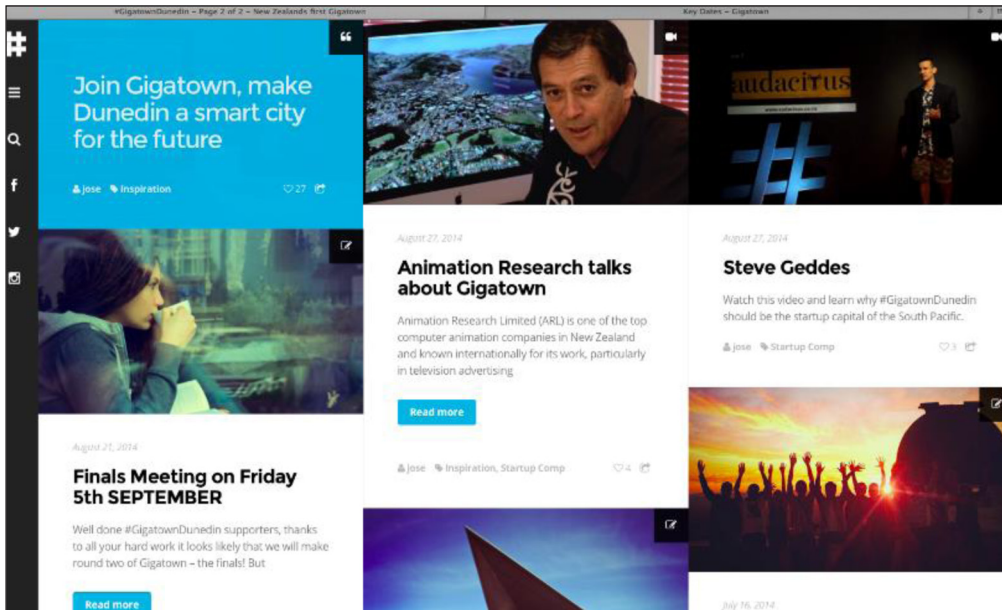


Figure 3: Screenshot of #GigatownDunedin page extolling the benefits of UFB (9 October, 2014) (<http://gigatowndunedin.co.nz/>).

can create advantages for businesses unrelated to ICT. Simply having access to email or search engines stimulates consumption (Pélissié du Rausas et al., 2011: 23). Surplus from the multimodal utility of the internet is also complemented by efficiency gains based on time-space compression. In a report by Alcatel-Lucent, one of the sponsors of the Gigatown competition, they suggest the redundancy of in-person visits to businesses, hospitals, and education enabled by ICT ‘frees’ up time for other efficiencies and that the digitisation and storing of information and data reduces the production of ‘hard’ materials (2012: 2, 5). As other scholars have noted (see Hondros, 2015) the notion of an online surplus is premised on disappearing digital time, materials, and space into an immaterial form of labour. That is, the notion of surplus time assumes that digitisation saves time by removing from view the labour involved in digitising services as well as their delivery and the ongoing maintenance of digital infrastructure. While digitisation may increase efficiency, when measured according to certain metrics, it replaces, rather than straightforwardly reduces, labour time and costs with other activities.

Alcatel-Lucent argue that in order to realise the projected gains from this surplus of time and utility, ‘an early “bow wave” of migration to UFB and RBI [Rural Broadband Initiative]’ is required to ‘accelerate application adoption, and ultimately drive the total level of application uptake as high as possible’ (Alcatel-Lucent, 2012: 7). Private companies have a stake in public and governmental support for broadband infrastructure because it requires significant subsidisation. For example, the McKinsey report suggests: ‘Governments could leverage Internet public spending as a catalyst for innovation. Indeed, countries with the highest public investment in the Internet are also those with the largest non-public Internet contribution to GDP’ (Pélissié du Rausas et al., 2011: 5). Governmentalising infrastructure implementation involves a discursive shaping and disciplining of its uses. For this reason, telecommunications policy also represents and instantiates particular ideals about a national polity and the characteristics of its inhabitants. Where once, the implementation of telecommunications

infrastructure would have been situated within policy concerns around universal access (see Compaine & Weinraub, 1997; Navas-Sabater, Dymond & Juntunen, 2002), under Gigatown, local and regional councils must now compete 'to show their worthiness' (The Digital Office, n.d.) to secure broadband resource allocation.

The competitive dimension to Gigatown was premised on the notion that the winner had to actively and creatively demonstrate that they deserved UFB. As the Chorus promotional materials urge, 'We're looking for the town that wants it the most ... by listening out for the town with the loudest voice on social media' (Chorus, n.d.[c]). Social media proficiency is underwritten by a biopolitical framing that constructs this capacity as an economic resource to be valued and fostered by local municipalities. Drawing again from Michel Foucault, biopower refers to a mode of power centred on the management of life and the population. Biopower operates through strategies of management such as census data 'to qualify, measure, appraise, and hierarchize' (1991b: 266) the value and utility of different segments of the population in order to maximise their economic (or otherwise) productivity. The reproduction of a competitive rationality for digital infrastructure allocation through Gigatown relates to the second aspect of this paper: (2) What were the conditions that enabled Gigatown to governmentalise municipalities and citizens to competitively promote the benefits of UFB for Chorus and the government?

Digital infrastructure and place-making in the post-industrial economy

Aotearoa New Zealand was separated into two islands by settler colonial geographies, the South or Te Waipounamu and the North or Te Ika-a-Māui. The North Island is geographically smaller but is more populous owing to the country's major economic and political institutions being located in either Wellington (Te Whanga-nui-a-Tara) or Auckland (Tāmaki-makaurau). South Island towns and urban centres have contended with Northern population drift and the loss of human capital and manufacturing, as well as degrading infrastructure, create impediments to global competitiveness. The ability to maximise early installation of UFB and win branding rights to the title, 'Gig City', therefore offered significant economic and technological benefits to the winning town. In this section, I outline how the competition stimulated an ICT enabled form of place-making in urban planning tied to creative and smart city policy priorities.

Creative and smart city planning in New Zealand

Cities and towns are increasingly located within a global economic, social and technological environment. With the shift to a post-industrial knowledge economy, where information and technological innovation replace traditional manufacturing, municipal councils and urban planners are encouraged by infrastructure schemes such as Gigatown to creatively leverage existing resources to compete with other regional, national and global urban centres. A key method of adding distinction to place, and thereby differentiating it from others in a global market, is through the adoption of 'smart' and 'creative' city policies where technological, creative and cultural innovation are positioned as the solution for economic revitalisation (see Caragliu, Del Bo & Nijkamp, 2011). In order to facilitate the industries for smart and creative industries, social and human capital also become strategically important. Social and human capital indicate the creative and cultural diversity of a population and can be developed through related forms of social and civic inclusion made available by urban governments. Smart and creative policy research correlate high concentrations of social and human capital with economic growth (see Florida, 2005).

The Gigatown competition exemplifies smart and creative urban planning through the use of social media to facilitate participatory urban planning that is tied to creative technological

innovation. Dunedin's Gig Plan for Success, which was a strategic plan for digital infrastructure required by the Gigatown competition finalists, mentions smart city planning through the implementation of an 'Internet of Things' to improve public infrastructure and services (Digital Community Trust, n.d.: 2). The Internet of Things 'describes the many uses and processes that result from giving a *network address* to a *thing* and fitting it with *sensors*' (Bunz & Meikle, 2018: 1). In this case, the Gig Plan is aligning the Internet of Things with city infrastructure so that a central network can accumulate data from sensors placed around the city. **Figure 3** shows content produced for #GigatownDunedin which outlined how UFB could make Dunedin 'a smart city for the future.'

Dunedin's Gig Plan also envisages UFB as enhancing Dunedin's capacity to attract creative workers and entrepreneurial tech ventures (see also **Figure 3**). For instance, the Plan describes a StartUp Space, which will stimulate 'a start-up incubator community' where 'An ambitious individual in medical school might meet an IT student, a developer, and a designer all in the same space. Together, they could create powerful tools for the health industry' (Digital Community Trust, n.d.: 7). This capacity to utilise (and brand) place as the site for social and professional networking is referred to as localised knowledge spillover (Caragliu, Del Bo & Nijkamp, 2011: 67) or creative milieus (Landry, 2008) in creative and smart city literature. Here growth is not measured simply in fiscal economic terms but as capacity for capital building through an environment that stimulates human and social capital. It's worth noting that universities, as key sites of population and knowledge growth, are integral to creative city planning (see Landry, 2008; Lorenzen & Frederiksen, 2008). Currently the University of Otago, situated in the centre of Dunedin, is downsizing staff in the Division of Humanities and has shut down the design studies programme in the Department of Applied Sciences (Green, 2015). The misalignment between the DCC's future planning and the management of the University of Otago indicates tensions in the economic valuing of creativity, where the perception or brand of creativity can take precedence over labour protections for creative workers. Perhaps the ambitious medical student in the Gig Plan could still meet the design students who have left Dunedin but online?

While promotional planning items such as the Gig Plan for Success stimulate a governmentised approach to valuing space in terms of its capacity for human capital, the competition itself also mimicked this kind of relationship-building through social media's networking apparatus, where higher numbers of people enfolded into a Gigatown account led to more points and a higher competitive advantage than others. As one interviewee noted, 'I pretty much leveraged any friendship and family member and, you know, business connection that I had' (Interview, 11 October, 2015). This logic of calculation was encouraged both by the social media platforms being used to create content about UFB and its benefits to participating cities as well as the competition's rules of play. The Kāpiti Coast District council, which governs a small coastal region in the North Island, considered the benefits of participating in terms of the competition metrics, 'If 40% of the Kapiti population registered this alone would kick start the Kapiti campaign by approx 200,000 points' (2013: 3). Similarly, at an Invercargill City Council (ICC) meeting of the Finance and Policy Committee, Venture Southland (tasked with managing town's participation in the competition) reported: 'Invercargill is sitting 14th out of the 50 towns and cities competing in the Chorus-run competition in which one centre will win \$200,000 and discounted 1 gigabit (100 times normal broadband) speed internet. We need to be in the top 5 by September to make the finals' (Invercargill City Council, 2014: 47). Both at the micro-level of participants who volunteered their time to create content, repost and like it, and at the macro-level of municipal governance, the competition was incredibly successful in mobilising the kind of relationship-building and resource leveraging required of creative and smart city planning. As noted above though, towns and cities with a larger

demographic size and infrastructure to facilitate crowd-sourced content had a structural advantage. **Figure 4** shows how #GigatownDunedin were able to utilise large public venues such as museums to house Twitter and Instagram marathon sessions where a high volume of content was produced.

Neoliberal competitive rationales for urban planning

Gigatown's influence goes beyond the specific prizes awarded and extends to its governmentalising capacity to discursively and infrastructurally imagine city planning through a competitive lens. The competition itself pits urban centres and towns in New Zealand against one another for their future viability. Its promotional materials introduce a global dimension to this competitive future planning. The highly publicised visit to Chattanooga for instance promotes the deterritorialisation of cities and towns, where the latter's 'interlocutor is not the surrounding *context* but the fact of the global' (Sassen, 2003: 24) in their relationship to economic and infrastructural futures. In a 'Gig FAQs' pamphlet distributed by Gig City Dunedin (set up after the city had won the competition), it explains that 'Dunedin's gig connection is a first for the Southern Hemisphere. However, you will find gig technology in a few other cities around the world such as; Singapore and Chattanooga' (GigCityDunedin, NZ, n.d.). Thus winning the competition enables Dunedin to be branded and represented on a global stage of technological innovation, where its geographical mediator is no longer the South of New Zealand but the South(ern Hemisphere) of the world.

The competition's incitement to UFB discourse is indicative of a governmentalised rationality that both promotes and legitimises 'the role of soft communication infrastructure in determining economic performance' (Caragliu et al., 2011: 67). Indeed, the Gig Plan for Dunedin notes the competition attracted 'in excess of \$500,000 in cash and in-kind contributions' (Digital Community Trust, n.d.: 10) and cites these figures as evidence of the DCC's capacity to leverage crowdsourced funding and entrepreneurialism towards a strategic infrastructural

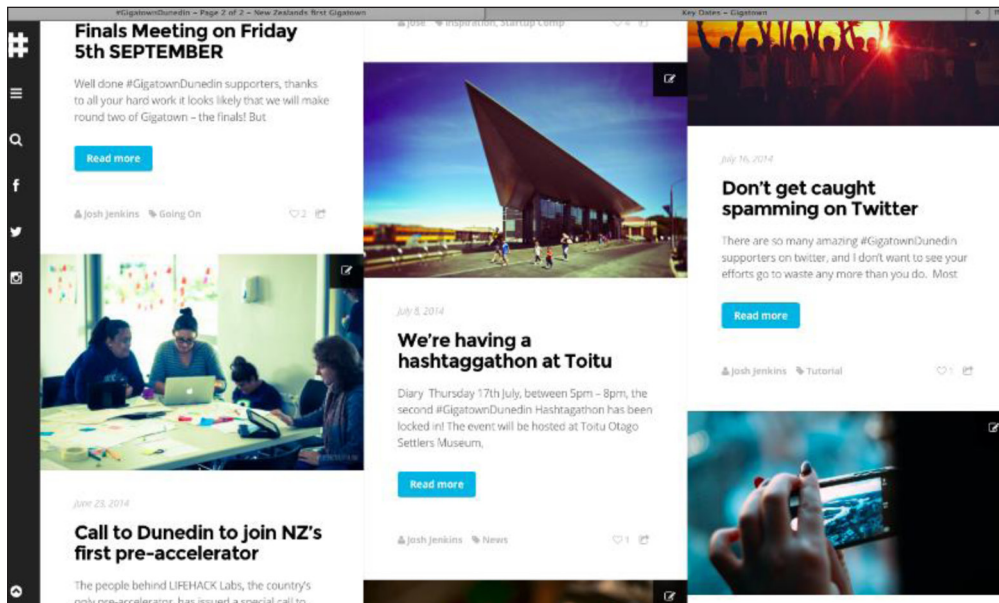


Figure 4: Screenshot of #GigatownDunedin soliciting volunteers for hashtagathon (9 October, 2014) (<http://gigatowndunedin.co.nz/>).

end (11). Such activity justifies their competitive readiness and deservedness to be 'first' in line for UFB installation. As noted above, the competition's tenuous claims to award a town the 'fastest internet', or that the gig connection is a 'first' for the Southern Hemisphere, drove much of the public criticism of the competition as encouraging wasteful spending and resources. However it is the competition's governmentalising role that mitigates such criticism.

For instance, the 2015–2016 Annual Report from Porirua City Council justifies Porirua's participation as worthwhile from a strategic planning perspective despite not winning: 'Dunedin won the contest, but the community sent a clear message that they valued this technology. As a result of this feedback, in December 2015 the Council launched the implementation of gigabit-speed Wi-Fi in the city centre' (9). The correlation between social media use and community participation (which is read as affirmation for digital infrastructure such as UFB) was also reiterated in Dunedin's Gig Plan: 'the entire city responded – 235,000 Facebook comments, 135,000 Tweets. The community had taken ownership. It confirmed a community-wide shift in the vision of what our City could be, and the role the Gig will play in that future' (Digital Community Trust, n.d.: 1). I have written elsewhere that this conflation of social media proficiency with participatory city planning creates digital forms of exclusion for citizens in geographical areas or age groups that lack ICT access (see Randell-Moon, 2018). What I want to emphasise here is that this participation was viewed as desirable by municipal councils because there were surplus planning and economic gains derived from Gigatown that went beyond the prizes.

The competition not only promoted UFB but a range of spillover and surplus ICT technologies and applications. Many of our interviewees commented that using social media for the competition revealed the applicability of this media for their businesses, which they implemented after the competition ended (though many also took an instrumentalist approach and commented that they ceased or significantly reduced their social media use after the competition had ended [see Randell-Moon, 2018]). Aside from business applications and the enhancement of public services such as education and health, promotional materials for the competition emphasised an active consumer of certain kinds of media. For instance the 'Gig FAQs' pamphlet states: 'accessing broadband over fibre ... means a great experience for all users of online shared applications such as cloud computing, video conferencing or online gaming' (GigCityDunedin, NZ, n.d.). At the level of municipal governance, this kind of media consumption was highlighted too in the Invercargill City Council meeting cited in the previous section: 'Benefits of winning could include: Our schools will give students better opportunities for learning; Hospitals can better access international information and specialists; whole households can be online at once watching movies, playing games or doing homework' (Invercargill City Council, 2014: 47). In a promotional item, Chorus use the analogy of luxury cars to illustrate the internet speeds of UFB as indicative of a high quality lifestyle: 'Imagine your gig connection is a Ferrari' that 'wants to go as fast as you do' (Chorus, n.d.[f]). In another press release, the capacity for smart homes and internal forms of surveillance enable residents to turn on remote heating (essential for a South Island climate!) as well as 'watch your baby safely sleeping from your mobile or even have the house check its inhabitants are healthy' (Chorus, n.d.[a]).

So far I have explained, (1) the neoliberal economic and telecommunications policy context for the initiation of the Gigatown competition and 2) the urban planning rationalities and post-industrial economic exigencies that stimulated participation, which was viewed as desirable by municipal authorities even if winning wasn't feasible. Although premised on UFB promotion at an infrastructural level, this section explicated how the Gigatown competition intersects with a range of both governmental and corporate digital strategies that also

discipline media consumption in particular ways and as being desirable for quality of urban and civic life. In the next section, I explore the implications of this integration of ICT into particular places to address the third aspect of the paper. The capacity for smart technologies to enable teleworking and an enhanced homelife suggests creative and ICT workers can labour from any place. As a result (3), place-based distinctiveness, attracting workers to particular places, paradoxically becomes more crucial to city branding.

Digital Cartography Enterprise

In the final section of the paper, 3) I consider governmentalised forms of place-making as tied to ICT readiness through the notion of a Digital Cartography Enterprise. This term encapsulates the ways particular spaces of a city are prioritised in planning and how the tensions between ICT's deterritorialising capacities and the need for physically space-based industries is resolved by devolving development risk onto consumer and resident uptake of ICT. That is, city residents must be willing to consume and innovate with ICT in order to turn the deterritorialising potential of global ICT into material rewards for their town. The Digital Cartography Enterprise stimulated by the competition is homologous to the way participation in the competition through social media approximates the kinds of social and human capital building and networking generative of creative cities. Planning for ICT infrastructure imitates the digital mapping used to create the territorial participatory framework of Gigatown by attempting to harness digitised spatial economies to material resources and place-based attractions in Dunedin. I will first explain how the digital mapping capabilities of the competition and ICT partitioned city-spaces in terms of UFB readiness before contextualising how Dunedin's participation and win in the competition is mapped onto and materialised in particular parts of the city.

Place-making and demography in the Gigatown competition

As explained above, the competition stimulated a governmentalised approach to town planning according to a logic of calculation based on population size and a city's capacity for social media relationship building. In the early phases of the competition, Gigatown recognised the economic and demographic disparities between towns by weighting smaller urban centres with higher points for their social media campaigns. A press release from Chorus (2013) explained, 'In the first of the two rounds of the Gigatown competition social media and supporters network points will be counted for each town and then multiplied by a correction factor to become "Gigapoints". The correction factor is based on the town's size, to ensure that each eligible town has the same opportunity to be the Gigatown'. How population size figured into these multiplications, i.e. what was the precise figure for the 'correction factor', were not released by Chorus (Venture Southland, 2013). South Island towns such as Queenstown, Dunedin, Invercargill and Wanaka took strategic advantage of this differential weighting to pursue successful Gigatown entries, placing them consistently atop the competition ladder. In the last stage of the competition, when the five finalists were announced, Chorus removed the population weighting and reset the scores to zero. This was, arguably, significant to Dunedin's win since it could leverage a greater population size compared to the other finalists, as well as a student population with a high level of social media proficiency, to create a larger volume of social media traffic (see also **Figure 4**). Thus despite the competition's rhetoric about the 'deserving-ness' of a particular town's win according to the quality of their participation, and the suggestion any 'town' big or small could be a Gigatown, sheer population numbers played a considerable role in securing the UFB for Dunedin. The latter works to reaffirm the infrastructural prioritising of larger cities and urban centres in the South Island.

In the North Island, larger cities such as Auckland and Wellington were divided into smaller areas based on electoral maps. The central and downtown parts of the cities were further

sub-divided into 'mini-towns' (Chorus, n.d.[b]). By using electoral maps and census data, the competition's cartography in mapping Gigatown participants was closely aligned with governmental forms of place-making. While this does seem like the most obvious and efficient way of dividing up participating areas in New Zealand, in replicating the electoral districts and dominant ways of understanding the city centres of Auckland and Wellington, Gigatown is also replicating the socio-economic inequalities within these cities by encouraging residents to view the human and infrastructural capital within these spaces in insular rather than cross-coalitional ways. That is, residents in an area with high social media literacy are rewarded by the structure of the competition to remain committed to this area rather than extend their advantages across different community sectors. The digital mapping of Gigatown then facilitates the partitioning and prioritising of city sections by residents and municipal authorities in terms of where UFB is best placed for maximum benefit.

Returning to the South Island and the role of digital mapping of infrastructural readiness for UFB, the competition's discourse about the global applications and planning imaginaries of ICT produced tensions in the justification for a place-based installation of the UFB. For instance, at the ceremony announcing Dunedin's win, Mayor Dave Cull stressed the opportunities enabled by 'weightless product in all its forms', suggesting that citizens are 'either in the digital space or nowhere' (Paredes, 2014). Drawing from the work of Joseph Pugliese (2010), I have suggested elsewhere that this dematerialisation of online activity constitutes a form of 'space-off' where the fiscal resources, digital labour and training as well as the space and time required to execute online activities, are consigned to an ontological and epistemological 'elsewhere' in order to shore up the legitimacy and centrality of ICT to the contemporary neoliberal knowledge economy (Randell-Moon, 2018). Space-off is present in Cull's statement because digital space is figured in opposition to *nowhere* – it is *somewhere* – but this somewhere is not specified or doesn't need to be specified as the spatial possibilities of ICT can ostensibly locate product *anywhere*. The labour to put this product anywhere reveals tensions in the deterritorialising capacities imagined for ICT.

Settler colonial territorial continuities in global digital reach

Cull expanded on this vision for digital space and the production of weightless product later at a Sustainable Cities forum (held 18 May), noting that Dunedin's population has been static since 1913 making 'Dunedin's livability' crucial to attracting 'a highly skilled workforce'. He asked: 'what kind of city do we need to be to attract the kind of people we want?' The answer was a city that could support an economy that generates 'light' and 'niche' products that can be 'easily transported down a fibre optic cable' (Author Notes, 2016). There is a paradox here in this vision of a deterritorialised economy that must also be place-based to yield benefits for Dunedin. Gigatown exemplifies these contradictions in the way that participants needed to demonstrate specific place-based reasons for securing the UFB installation at the same time as promoting the globalising capabilities of UFB. For instance, Dunedin's Gig Plan has to both acknowledge the benefits of immaterial labour and digital space (where people can work and learn anywhere) while also simultaneously convincing the judges that Dunedin has place-based attractions for entrepreneurs (i.e. people should work and learn here). A parochial sense of homeliness is infused into the document's imagining of an ICT enhanced Dunedin – perhaps encouraged by the competition's emphasis on 'towns' rather than 'cities' noted above. The Plan suggests, 'Highly skilled ex-pats will be attracted home' (Digital Community Trust, n.d.: 8) now that home is equipped with UFB. The Ngāi Tahu heritage of Ōtepoti is also touted in the Gig Plan as key attraction of the city (2) and used to provide a glocalised understanding of how Dunedin maintains its distinctiveness whilst participating in a global economy.

There is a Maori saying, Ka Tangi te Titi, that describes a humble muttonbird (a true Southern NZ icon) that travels the world seeking opportunities but always staying firmly focused on its home. The Gigatown competition has brought new meaning to this story, and has helped us bring together the plans and visions that will see us travel new highways to the world, seeking opportunities but always staying firmly focused on our home: GigatownDunedin. (17)

Such invocations of indigeneity are interesting in light of digital conceptions of the future where technology will ostensibly render place, and therefore Indigenous communities with place-based responsibilities, redundant (see Byrd, 2009). It should be noted that the discursive framing of Dunedin as a 'frontier' opening up a new global economy through digital infrastructure relies on settler colonial notions of the area as being 'closed' and 'under-developed' prior to the introduction of technologies of mobility. This is explicated in an advertisement for Dunedin's participation in Gigatown which opens with the ship *Dunedin* sailing into the harbour in 1882 and enabling 'a refrigerated highway to Britain that supercharged the economy of a small country' (OtagoDailyTimes, 2017). The portrayal of Dunedin's history, and indeed its naming as conflated with a settler colonial mode of transport, in this way is telling. The ship's technological continuation into UFB networks overwrites Māori occupation and settlement of the area, as well as Indigenous geographies, even as the new spatialised economies of ICT imagine a glocalised place for Ngāi Tahu in city branding.

Digital Cartography Enterprise

In materialising GigatownDunedin, city planning engages in a Digital Cartography Enterprise by mapping ICT infrastructure over existing city-spaces of economic importance. The DCC has utilised competition participation to strategically link UFB to its spatialised reimagining of Dunedin. The Gig Plan mentions how the 'Revamped Gold Rush-era warehouses are being reclaimed by an expanding technology sector' (Digital Community Trust, n.d.: 1), which aligns with its Warehouse Precinct Revitalisation Plan (2013) and Dunedin Central City Plan (n.d.). Briefly, the 'Warehouse Precinct' is an area to the south of the city centre that had previously housed industrial and manufacturing businesses in large modernist style buildings that have fallen into disuse with deindustrialisation. The buildings and large interior spaces were then occupied by artists and students, the only customers willing to rent the spaces, giving the area creative capital. The DCC's recent interest in improving the public facilities surrounding the buildings have attracted professional businesses and high-end rental investments to the area, resulting in what some argue is gentrification and the displacement of the original creative workers (Porteous, 2013). Concentrating the Giga branding in this area furthers the DCC's intention to generate interest from a high-earning professional class and tech economy as a means of refurbishing the area.

The Central City Plan, developed by Urbanism+ urban design consultants, is an attempt to maximise a centrally designated area of Dunedin for higher levels of consumption, tourism and office real estate. The Gig Plan outlines how a digital hub, Our Living City, will be 'in the heart of Dunedin' and combined with a Digital Dunedin Dashboard that presents 'real-time information for the general public about how Dunedin breathes' (Digital Community Trust, n.d.: 5). In addition to the 'giga-hotspots' offering free Wi-Fi, and located near the Octagon (13) in the centre of the city, the Gig Plan is tailoring UFB capacity to strategic spatial planning. Of course it makes sense that the Gig Plan would not discard already existing planning and attempt to enhance and reinforce these areas designated for revitalisation. However for all the rhetoric of creative risk-taking, the competition's enterprising logic is governmentally conservative in the digital cartographies envisioned for the city. It seems it was too

risky to locate digital infrastructure outside the city centre and in places where a lower socio-economic and aged demography (for instance South Dunedin) would have benefited from capital investment, increased ICT literacy and place branding.

I have argued that the Gigatown competition stimulates a governmentalised spatial planning that can be understood as a Digital Cartography Enterprise. Drawing on creative and smart city discourses, both the competition and DCC strategic planning attempt to harness the creative risk-taking and enterprising values attributed to post-industrial creative and ICT labour. Such labour is directed into specific parts of Dunedin based on the partitioning of city space into areas of maximum utility and investment encouraged by the digital cartographies of the Gigatown competition. Where previously, the settler colonial technologies of mobility instantiated Dunedin as a place on the map and to be mapped through mercantile trade, the deterritorialising capacities of ICT promise entry to a global market that simultaneously threatens to negate a placed connection to Dunedin.

Perhaps as a way of making sense of these contradictory demands, Dunedin is imagined in the Gig Plan as enterprising and creative enough to overcome them. The Digital Community Trust is framed as 'agile and nimble' (2), the city will be 'a sandpit of creativity' (14) 'promoting open access for universal benefit' (13). Owning 'the brand that is Gigatown' (8) is crucial to this process with social media users exemplifying the city's capacity to secure infrastructural dividends through volunteered labour. The Gig Plan notes they have '33,000 passionate brand advocates' (16) based on the number of participants in the competition. Speed is a crucial spatial-temporal marker of success in a post-industrial economy indicating both geographical and demographic reach. In the governmentalising context of the Gigatown competition, demographic reach also evidences participatory civic affirmation of the benefits of digital infrastructure. Like the Ferrari, discussed previously, being used as the analogy for the life-enhancing experience of UFB, a Digital Cartography Enterprise seeks to overlay existing urban space and public resources with digital capacities and tech economies that promise a faster and better lifestyle in Dunedin. The term Digital Cartography Enterprise attempts to capture the ways planning futures and choice about such futures are made intelligible and mapped out by urban post-industrial spatial rationalities and policy in terms of ICT exigencies as a matter of infrastructural and economic security. Within the parameters of such an enterprise, the option of refusing a luxury UFB connection (or Ferrari) seems absurd and the momentum of a Digital Cartography Enterprise is seemingly unassailable. As our Mayor says, you're 'either in the digital space or nowhere.'

Conclusion

In this paper I have argued that the Gigatown competition represents a significant governmentalising achievement for South Island as well as smaller urban centres and towns in their planning policies with respect to securing ICT infrastructural readiness. The novelty of the competition and its marketing rationale for Chorus should not distract from Gigatown's role in shaping communication infrastructure and power relations in New Zealand according to public-private enterprises that enclose participatory planning within the entrepreneurial logics of the global tech economy. The actuarial logic of the Gigatown competition stimulated a range of activities that cohere with corporate and government policies on creative and smart cities and the growth of ICT and immaterial labour as it effects both business and public sectors. In its attempt to remake city-space as receptive for an imagined ICT future, the competition exemplifies what I call a Digital Cartography Enterprise. This term attempts to capture both the neoliberal and post-industrial spatial rationalities of urban planning and policy with respect to securing ICT-readiness as well as the governmentalised disciplining of the population to creatively subsidise such a venture through appeals to their entrepreneurialism as civic

participation. An enterprise necessarily involves risk. The competition devolves this risk onto citizens as consumers by encouraging them to view their own economic security as being realised and made possible through ICT use that is mapped onto city-spaces already aligned with the strategic priorities of business, tourism, and consumption. In an economic climate where scarcity of resources must be creatively mobilised, South Island cities and urban centres prioritised the Gigatown initiative as central to their viability in a global market. Embarking on a Digital Cartography Enterprise is a gamble cities undertake to cultivate a future amidst a competition where not everyone can win.

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The author has no competing interests to declare.

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