



More-than-local, more-than-mobile: The smart city effect in South Africa

Ola Söderström^{a,*}, Evan Blake^a, Nancy Odendaal^b

^a University of Neuchâtel, Switzerland

^b University of Cape Town, South Africa

ARTICLE INFO

Keywords:

Smart cities
Policy mobility
Cosmopolitanisation
Globalisation
South Africa

ABSTRACT

This paper explores how the smart city phenomenon becomes nearly ubiquitous in countries and cities around the world. Drawing on policy mobility studies and cosmopolitanisation – defined as globalization from within – it focuses on the roll-out and take-up of smart city narratives and interventions in South Africa since 2005. Based on a media analysis on national and local scales, the paper shows that the smart city effect is an entangled phenomenon. Generally speaking, it consists of a lexical glue that holds together processes of data-driven neo-liberalisation of urban governance. However, at municipal level we observe more variegated effects of reverse-scale policymaking, labelling and territorialisation where the smart city appears as a more-than-mobile but also as a more-than-local urban policy.

1. Introduction

The notion of smart cities has recently become an influential urban governance and development narrative at an international level. Today one-third of UK cities and two-thirds of US cities are involved in smart city initiatives (Karvonen et al., 2019). The European Union's programme on Smart Cities and Communities launched in 2014 has, thus far, funded projects in 40 'lighthouse cities' and 50 'fellow cities'.¹ The list of indicators of this process of policy globalization is expanding year after year in scholarly studies. In this paper we examine how, and why, the smart city phenomenon – as discourse and intervention – has become nearly ubiquitous. Specifically, this paper examines the roll-out, take up and provincialisation of the smart city narrative in South Africa.²

Our aim is both theoretical and empirical. Theoretically, the paper contributes to an understanding of how the smart city becomes global. It draws on discussions and complementarities between literatures on policy mobilities (McCann, 2011b; McCann and Ward, 2011a; Peck and Theodore, 2015) and cosmopolitanisation (Beck, 2006; Blok, 2012, 2016, 2020). We argue that if a policy mobility approach focuses on relations of exteriority showing how a local or global policy is rolled out in specific places, a cosmopolitanisation approach focuses on the role of the actions of the 'global other' from within specific places (Beck, 2011). In other words, we argue that the smart city phenomenon is more than a

mobile policy. It is a mobile policy in the sense that a set of globally circulating smart city ideas and principles are rolled out in an increasing range of contexts worldwide. But it is also *more* than a mobile policy. Translocal relations do not explain the textures of smart cities discourses, policies and initiatives. The smart cities narrative is not related to a specific place, model or standard, but is rather constituted by a loose discourse which has multiple places of origin and is difficult to 'geolocalise'. Municipalities and local actors actively (and often strategically) negotiate, reshape, select and produce new versions of this globalizing narrative. They do so, as this paper shows, by using more-than-local resources.

The paper is structured in three parts. The first specifies our analytical contribution on the globalization of smart cities. The second investigates how the narrative has evolved in South Africa and the mechanisms at work. In our third section, we outline three municipal strategies in South Africa and the logics of smart city 'take up' from within. We conclude by reflecting on the dialectics and permeability between 'exterior' push mechanisms and 'interior' in logics of contemporary urban policymaking.

2. Smart Cities as a global phenomenon

Since the early 2000s, there has roughly been four strands of thought

* Corresponding author at: Institut de Géographie, Université de Neuchâtel, Espace Tilo-Frey, 2000 Neuchâtel, Switzerland.

E-mail address: ola.soderstrom@unine.ch (O. Söderström).

¹ See : <https://smartcities-infosystem.eu/scc-lighthouse-projects> (consulted 21.05.2019).

² This paper is one of the outputs of a research project funded by the Swiss National Science Foundation on the provincialisation of the smart city in India and South Africa led by the first author and Ayona Datta (Co-PI) at University College London.

with regard to the smart city phenomenon. A first strand interrogates the efficacy and availability of smart technologies for cities with specific applications such as energy efficiency or reduction in carbon emissions (Bakıcı et al., 2012; Fischedick, 2012; Paskaleva, 2011; Rat-Fischer et al., 2012; Streitz, 2011). The second sees the smart city as an assemblage of technologies aimed to increase competitiveness and administrative efficiency (Allwinkle and Cruickshank, 2011; Caragliu et al., 2011; Deakin, 2014; Kuk and Janssen, 2011). Departing from the largely critical approach of these two analytical approaches, a third body of scholarly work emerged after 2011 aiming to deconstruct the discourse and ideology of smart cities (Kitchin, 2014; Luque-Ayala and Marvin, 2015; Vanolo, 2014) and explore alternatives to corporate-led versions (Hemment and Townsend, 2014; Marvin et al., 2015; McFarlane and Söderström, 2017). The fourth empirically analyses policies, material interventions or collective action (Datta, 2015; Odendaal, 2016a; Wiig, 2015b), or ‘actually existing smart cities’ (Kitchin, 2015; Shelton et al., 2015). This fourth wave takes its distance from critical studies looking at smart cities primarily as a discursive and unitary phenomenon: a new guise of entrepreneurial urbanism (Hollands, 2008) or a form of corporate storytelling (Söderström et al., 2014).

There are discrepancies between narratives promoted by IT corporations or policy gurus and smart initiatives on the ground (Wiig, 2015b). A realist stance focusing on actual smart cities should undoubtedly be adopted. Despite the call to move beyond discourse, and accounts of the ‘real smart city’, discourse is central because: ‘it shapes concepts and programs, and is a key means by which ideas and practices are borrowed, transmitted, and reproduced within different geographical, cultural, and institutional settings’ (Joss et al., 2019, 3–4). Therefore, the smart city phenomenon cannot be understood without analyzing how narratives are articulated with initiatives on the ground (Picon, 2015).

These articulations can be studied at different scales. Globally, it raises the question of the mobility of smart cities as discourse, expressed in policies and practices. Developed by geographers since the early 2000s in response to the limitations of policy transfer studies in political science (McCann, 2011b; McCann and Ward, 2011b; Peck, 2011), policy mobility studies draw on mobility studies and actor-network theory. They focus on the geographical trajectories of policies: how they are selected and packaged, and how they are then modified in the ‘travel’ itself as well as in the place they are imported (McCann and Ward, 2011a). Hence the term policy mobility was suggested by McCann, instead of policy transfer, the more traditional term within political science, which pays less attention to the trajectories of urban policies (McCann, 2008). Other authors have questioned the concept of mobility, with its material connotations, as a limited means for grasping the variegated ways in which policies move (Allen and Cochrane, 2010; Robinson, 2013). These include “ephemeral spaces of interaction and communication, half-forgotten meetings, fleeting encounters, rumours, and long buried memories of policy terminology” (Robinson, 2013, 10).

Most of these studies focused on identifiable ‘places’ of origin: New York for the Business Improvement District policy in Johannesburg (Didier et al., 2012), Tony Blair’s creative industries concept in the UK and Richard Florida’s urban development theories for creative cities policies in Singapore and elsewhere (Kong, 2014), the Los Angeles 1984 Olympics for Manchester’s 1992 bid (Cook and Ward, 2011) or Frankfurt’s and Zürich’s harm reduction strategies for Vancouver’s urban drug policy (McCann, 2011a). The smart city has recently been analyzed as a mobile policy in cities such as: Austin, Boulder and Chicago in the US (Levenda, 2019), Nottingham, Stavanger, Stockholm (Wathne and Haarstad, 2020) and Torino (Crivello, 2015). A mobile policy frame provides a useful approach and concepts that trace policies across space from one site, through learning spaces such as conferences (Andersson and Cook, 2019; Cook and Ward, 2012) and study tours (González,

2011; Montero, 2017), to their territorialisation in another site. The underlying vision of globalization is one of a locally engineered phenomenon going global through an extension of socio-material networks (Latour, 2005).

However, some globalizing phenomena are difficult to trace, not only across space to a place of ‘arrival’, but also to a locus of origin. To account for the local emergence of policies found elsewhere, the use of a broader repertoire of perspectives and concepts has been proposed (Söderström and Geertman, 2013b). It includes worlding, provincialisation and cosmopolitisation. In the context of urban studies, ‘worlding’ refers to how cities are imagined as part of the world through, for instance, ‘inter-referencing’: ‘practices of citation, allusion, aspiration, comparison and competition’ (Ong, 2011, 17). As Burns et al. (2021, 464) observe: ‘Many smart city initiatives mobilise worlding strategies’. Provincialisation situates the analysis of urban policies in the geographies and histories of the (post-)colonial, envisaging cities in the Global South both as sites where models and narratives of the Global North are reinterpreted and as ‘new loci of enunciation’ (Sheppard et al., 2013, 895). A growing body of research on smart cities studies urban initiatives in the Global South as processes of provincialisation (Datta, 2019; Guma, 2019; Watson, 2014). Both worlding and provincialisation are conceptual frames that direct the analysis towards the sites where global or globalising urban policies ‘arrive’ or are reinvented. The same applies to cosmopolitisation. We argue that cosmopolitisation provides a particularly useful complement to policy mobility studies for making sense of the globalisation of the smart city narrative.

Cosmopolitisation, refers to the work of the sociologist Ulrich Beck (in particular: 2006), as an ongoing process of ‘globalization from within’. This signals a departure from a more traditional reading of the term: “whereas globalization presupposes, cosmopolitisation dissolves the ‘onion model’ of the world, where the local and the national form the core and the inner layer and the international and the global form the outer layers” (Beck and Sznaider, 2006, 9). Combined with what constitutes another feature of contemporary societies for Beck, ‘reflexive modernization’ (Beck et al., 1994), this produces a vision of cosmopolitisation as a “process of integration through reflexive globality” (Beck, 2004, 143).

Drawing on Beck, Anders Blok has argued that urban development strategies and outcomes are best understood as a combination of transnational policy mobilities and cosmopolitisation (Blok, 2012, 2016, 2020). The difference is that “whereas transnationalization connotes an *intensification* in the flow of people, ideas, goods, and money, cosmopolitisation also implies an element of *internally* reorganizing local social identities, in view of the reality of greater global connectedness” (Blok, 2012, 2331). The nuance between this transnationalisation/cosmopolitisation framework and the relationality/territoriality (McCann and Ward, 2010) approach of policy mobility studies is subtle and might appear negligible. But Blok uses it to underline two phenomena. First, the high density of city relations stemming from the important development of the phenomenon he studied: urban sustainability networks. Hence, cities developing low-carbon policies tend to borrow from a vast and diffuse array of principles, databases and experiences in many different places. Second, cosmopolitisation sheds light on how ‘vernacular attachments’ play an important role in how professionals renegotiate “the identity of one’s city within the ‘worldly’ geography of climate change” (Blok, 2012, 2336). Therefore, the subtle differences with policy mobility studies lie in the fact that cosmopolitisation highlights that – contrary to Latour – some policies are more-than-local in their origin, or space of elaboration, and are further reshaped and complexified in their local formulations. It allows movement beyond the ‘cosmopolitan-parochial binary’, ‘to embrace a more co-constitutive approach’ (DeVerteuil et al., 2019, 66).

Smart cities policies aptly illustrate this process. Like green urbanism, smart city policies are elaborated by a dense web of spatially distributed actors and have a series of historical antecedents (Angelo and Vormann, 2018; Townsend, 2013). Although corporations like IBM attempt to construe themselves as obligatory passage points (Söderström et al. 2014), the origin of smart city narratives cannot be easily associated with a place, a time and a limited set of actors.³ Moreover, empirical studies ‘inside smart cities’ (Karvonen et al., 2019) highlight the agency of municipalities. For instance, an analysis of three EU Lighthouse smart cities - Stavanger, Stockholm and Nottingham - shows how they strategically use the smart city narrative to reach their policy objectives. Local actors ‘smartly’ pick aspects of this narrative and align it with their needs (Haarstad and Wathne, 2019). To account for this entanglement of logics in the emergence of the smart city, it has even been suggested to abandon the Machiavellian strategies assumed by the sociology of translation with a ‘sociology of equivocation’ (Viveiros de Castro, 2004) “to describe complex ecologies of cooperation shaping urban governance in an around the smart city, as articulating incommensurable worlds” (Farfás and Mendes, 2019, 184).

This does not imply that powerful strategic actors cannot play a role in the globalization of the smart city, but we should not be blinded by the role of transnational corporations, the EU or governments in analysing the mobility of smart city policies. Analyses that reveal the creative, reflexive and collaborative actions from within cities speak to a more reflexive and iterative interpretation of the smart city idea. Therefore, our study in South Africa uses the vocabulary of policy mobility studies and theoretical insights of cosmopolitisation as globalization from within. But first we must return to the role of discourse in the globalization of smart cities and how we interpreted it and applied it to our research.

3. On discourse and methodology

Discourse analysis is insufficient to get an understanding of the contemporary smart city phenomenon. It is crucial to investigate investment flows, technologies, and material interventions. However, discourse is a central feature of the phenomenon for different reasons: it works as a vector of global policy mobility, it glues together heterogeneous local urban policies and interventions, it brands a city and its policies and may open the wallets of funding bodies. Thus, the interrogation of smart city discourses provides an important empirical entry point for understanding its global reach. By surfacing the discourses at work in a geographic setting, the many textures of its appropriations are revealed.

The discursive construction of urban policies has been abundantly analysed in policy mobility studies: as a framing device of problems and policy responses (Temenos and McCann, 2012), as mythical narratives of local policy initiatives and achievements (Montero, 2020), or as persuasive speeches, presentations and informal discussions in conferences (Andersson and Cook, 2019; Cook and Ward, 2012). In our study, we specifically look at discursive practices in national and local media. We look at discourse in two ways. First, as a trace of the geo-history of the smart city narrative in South Africa and, second, as an indicator of local appropriations and strategies in this discursive context. Our approach is close to the web-metric study conducted by Joss et al. (2019, 6) to understand ‘how the smart city is constructed as a discourse regime’ on a global scale. They show how this discourse is not monolithic but constituted by a series of storylines – regarding for instance environmental aspects – that are more or less present in different cities across the world.

The fact that ‘the smart city’ is not a model related to a specific city –

Barcelona or Amsterdam – or to a specific intervention – such as Business Improvement Districts or waterfront developments – but a ‘global discourse network’ (Joss et al., 2019, 5) is why and analytical approach, that uses both cosmopolitisation and a policy mobility approach, is useful. The first allows the smart city to be studied as a set of discursive components emerging at various sites and times, while the second allows interrogation of local strategies of appropriation in relation to different policy scales and their intersections (Wathne and Haarstad, 2020). Our particular interest was to examine the dominant narratives, and explore whose stories feature more prominently than others? Which version of the global smart city informs policy and practice?

Despite diverse interpretations, there are nevertheless dominant discourses that push a particular view of the power of technology. What Kitchin calls the ‘one-size fits all narratives’ (Kitchin, 2015, 134) dominate the literature, as critique or application of its ideas. We agree with Kitchin that empirical work is needed, specifically on how the smart city idea translates under similar idea frameworks in different locales. Thus, our work focuses on one country case: South Africa.

Classified as an upper middle-income country (UMIC) by the United Nations Population Fund (UNFPA ESARO, 2019) that shares many characteristics with countries in Eastern Europe and Latin America, South Africa provides an opportunity for a granular analysis of this phenomenon. Like many other countries in the global South, its backbone digital infrastructure is well developed, but it nevertheless has high rates of income inequality and service backlogs, that makes the aim of the ubiquitous smart city hard to achieve. Furthermore, notwithstanding recent political rhetoric, its national government has not embraced the smart city ideal as a national policy drive, unlike other southern countries, such as India or Rwanda for example. Yet, many smart city policies exist at city level, which points to the third feature of the country that is of interest: its highly autonomous and decentralised local government system. This makes it very different from other African countries where the smart city model has been driven in a very top-down fashion by central governments in partnership with private actors (Watson 2014). The developmental state is a central feature of the South African state, yet its economic policies rely heavily on foreign and local private capital (Sutherland, 2020). The digital city or smart city idea emerged in different forms and manifestations after the restructuring of local government in the early 2000s, as an extension of its developmental role (Odendaal 2003; 2011). As a result, we argue that there is enough variation across cities to support the notion that the application of this narrative reflects a number of nuances not yet adequately covered in the literature. The first is uncovering the play between local appropriation in relation to national policy frameworks; the second is how different discourses coalesce in particular urban contexts and the third is revealing the landscape of actors compliant in generating these discourses over time.

The language of smart has been present since the late 1990 s but has adapted to technological change, informed by dominant actors and influenced by historical and geographic contexts. Notions of the ‘digital city’, the ‘cyber city’ or ‘smart communities’ are as much a function of policy fashion as they are of academic inquiry. As Willis and Aurigi point out (2017: 17): “they represent certain interests and are not necessarily the reality of what is actually happening in the city”. The point is that the many languages of smart urbanism found resonances at different moments in relation to policy and historical circumstances. In the South African context, given the extent of local government decentralization and powers and functions of national state departments, it is therefore important to capture the various smart languages locally and nationally, over a reasonable time frame.

Using a webometric approach, we used the following tools: a Lexis Nexis⁴ database scrape, examination of relevant plans and policies and a

³ This variety of the really existing smart city is probably even wider in the Global South than in the Global North where attempts to establish standards through agencies such as ISO are more important (Joss 2019).

⁴ We accessed South Africa media sources using the academic-oriented Lexis Nexis service: www.lexisuni.com.

review of media reporting. Lexis Nexis contains archives from the majority of South Africa's national and provincial print publications in the English language. As Table 1 demonstrates, this research made use of the full scope of 'mainstream' media representation of national, regional and local coverage of 'smart' rollout and take-up. Mainstream sources include reporting from Independent Online (IOL) partners (covering a scope of local municipal, provincial and national print and online news providers) and industry-specific news portals such as ITWeb Online where topic-specific print and online news (again, ranging from national to hyper local reporting) were collated and catalogued.

Although the mediascape makes use of news sources covering different scales ranging from national to local news sources (e.g. The Sunday Times versus The Dispatch as demonstrated in Table 1), the use of scales within the database itself is not predicated on the news source. Scale is textually determined from the content of an article, determined from an analysis as to the scale at which programmes, interventions and policies address ICT-mediated governance and smart. For example, a national reporting source may focus on a localised municipal smart-related infrastructure intervention, giving the reporting a distinct spatial framing. In this instance while the news source itself operates at a national scale, the target of the reporting is distinctly local and would thus be coded as such in the media database. Instances in which reporting discussed the intersection of scales (e.g. the ramifications of national and regional policy direction on local programmes) are coded and noted in the collated media database as cross-scalar moments.

Key terms (see Table 2 below for a list of the terms used) were gleaned from Willis's and Aurigi's (2017, 6–7) overview of the lexical antecedents to the smart city. A media scan revealed that smart discourses emerged most prominently during 2005, with the term 'digital city' dominant at the time. Since our research concluded in October 2018, this resulted in a 13-year timeline that guided our enquiry. We used the key terms to conduct a media search on a year-by-year basis to produce a set of article results from Lexis Nexis, harvested to be manually parsed, to reveal textual nuance. Content parsing was guided by thematic categories including geohistorical aspects (year of reporting and place(s) at the central focus of the article), the key ICT development lexicon deployed, primary actors operating under this framing and the types of interventions engaged by these actors. Primary actors were parsed and coded to identify general groups, interests and institutions that shape or are shaped by smart-related activities. This approach to defining actors is intentionally broad in scope and does not attempt to identify individual actors and comment on their specific intentions and rationales. The approach we took focused upon context: specific configurations of actors that coalesce around different lexicons and types of intervention, in the South African smart space, as portrayed in the media.

Subsequent media searches were guided by emerging terminology or narratives associated with the smart city. Examples include the 'aerotropolis', in Ekurhuleni and the notion of the innovative city in many other cities. After excluding duplicate and unrelated reporting, four-hundred-and-fifty news reports were read and coded in this manner to produce a lexical database. Codes for each category were synthesised and merged according to similar meanings and functions. Table 2 demonstrates the final synthesis of these coded categories.

Frequency analyses of this database between locations produced a timeline in which general trends and patterns were observed. Three time periods were observed in which smart-related lexicon develops in a

Table 1
Sample of news sources scraped to compose the mediascape database.

NATIONAL SOURCES	REGIONAL SOURCES	LOCALE SPECIFIC
ITWeb Online	Cape Argus	Daily Dispatch
Mail & Guardian	The Star	Pretoria News
Business Day	The Herald	The Tatler
Sowetan	The Mercury	The Witness

Table 2
Lexical code volume spread across both time and discourse.

Top twelve lexical terms present in South Africa media database	2005 – 2008 article count	2009 – 2013 article count	2014 – 2018 article count	Total article count
Smart city	30	57	250	337
Digital city	45	18	19	82
Innovative city	2	3	14	19
Climate smart city/green city	0	5	12	17
Living lab	1	4	9	14
Wired & wireless city	5	4	2	11
Safe cities	0	2	8	10
IoT city	0	0	9	9
Intelligent city	3	0	5	8
Smart energy city	0	1	6	7
Aerotropolis	0	7	0	7
Connected city	1	0	6	7

distinctive manner and shifts the relationships of actors and accompanying interventions. These three periods are marked in the discussion to follow as 2005 to 2008, 2009 to 2013 and 2014 to 2019. Further cross-comparative analysis was conducted between places in the database framed by these period patterns. The results from these analyses informed the discussions to follow. A key limitation of the database is the use of press-only sources with distinct 'mainstream' media bias with an over-representation of State and private sector voices. Another limitation is the exclusive analysis of the English-language media in a country with 11 official languages. Furthermore, South African publications covering current grassroots and civil society issues from national to local scales are predominantly online based, not part of the Lexis Nexis archive. Views that dominate such publications were investigated in the next phase of the research, outside the scope of this paper.

4. Smart city discourses and policies in South Africa

The framing of the research was informed by literature on smart cities in South Africa (Odendaal, 2016; 2003), as well as more general work on African urbanism and South African cities (Pieterse and Parnell 2016; Harrison 2015). The smart city narrative is not new in South Africa (Odendaal, 2016). The original digital city surge in the early 2000s coincided with the restructuring of local government in South Africa. In the early 2000 s, not only did newly restructured city administrations focus their energies on service delivery, but the digital revolution was seen as a means to enable that more efficiently by an accountable and transparent city government (Odendaal 2003).

Early smart city discourses were imbued with developmentalist zeal. This relates to how the post-Apartheid state was, and is, constructed. The Constitution, promulgated two years after the first democratic elections in 1994, stipulates that the state comprises three distinctive, but inter-dependent spheres of governance, where the functioning of each is not to be interfered with by the other two spheres (Madumo, 2015). Nevertheless, South Africa is a unitary state where the three spheres are interrelated: national government establishes a policy framework through general and sectorial programmes, the nine provinces facilitate, monitor, and guide the implementation of sectorial programmes, and are responsible for municipal oversight and guidance. The 283 municipalities (consisting of three categories: districts, metropolitan and local councils) are responsible for service delivery and socio-economic development. The White Paper on Local Government (1998), that informed the restructuring of local government, defines 'developmental local government' as the sphere committed to working with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives" (White Paper on Local Government, 1998: 17). The developmental impulse is engrained in the post-Apartheid national project of

democratization and economic development, with the role of municipalities instrumental in enabling change.

Thus, our research uncovered the evolution of the smart city idea in relation to substantive themes informed by national discourses. They include sector-specific strategies as they relate to infrastructure rollout and economic targeting and innovation. A review of public documents and plans, such as national sector strategies, and national development policies, shows the framing of smart technology as infrastructure; examples include the need for smart infrastructure to enable human development and as an important economic driver in the National Development Plan (RSA, 2013) in some cases referred to as ‘economic infrastructure’ (pps. 63–64). Governance is an important theme that emerges in the Integrated Urban Development Framework (RSA, 2016), focusing on ICT as a connector and integrator across infrastructure platforms. Sector-specific strategies such as the ICT Roadmap, the National Transport Master Plan and the South African Smart Grid Initiative sees ICT as catalytic to innovation and service efficiency. What emerges is an indirect engagement with ICT that is pragmatic and generally functionalist, rather than seeing it as a development catalyst.

However, satellite cities and edge urban development is all too familiar in the South Africa cityscape, with passing references to smart surveillance infrastructure in marketing security estates. These are privately developed gated communities, established on vacant land outside urban centers. Examples include Waterfall City and LAC/Cradle City outside Johannesburg enabled by what Herbert and Murray refer to as “...a new kind of privatized urbanism, where entrepreneurial modes of urban governance have replaced public administration...” (2015: 490). Whilst the influence of local government appears to be limited in these examples, the agency of local government is apparent in the stalling of the Modderfontein megaproject, also in Johannesburg, where municipal planners’ concerns that the proposed development would not conform to spatial development principles embedded in city plans, contributed to it not going ahead (Ballard and Harrison, 2020).

Thus, up until 2018, the smart city idea has been largely implicit in national policies and plans, with the rhetoric not yet embraced fully by private property developers. In an online review of speeches and political media claims more recently (January 2018 to June 2019), the more indirect notion of the Fourth Industrial Revolution emerged more frequently in public documents. Perhaps its most overt and public reference is in the 2019 State of the Nation Address (SONA), with President Cyril Ramaphosa proclaiming:

“I dream of a South Africa where the first entirely new city built in the democratic era rises, with skyscrapers, schools, universities, hospitals and factories...”

We have not built a new city in 25 years of democracy. Seventy percent of South Africans are going to be living in the urban areas by 2030.

Has the time not arrived for us to be bold and reach beyond ourselves and do what may seem impossible?

Has the time not arrived to build a new smart city founded on the technologies of the 4th Industrial Revolution?”

(RSA, 2019)

The commitment to the construction of smart cities was further elaborated upon in the 2020 SONA. Given the unemployment rates in the country, the job creation potential of new technologies and associated industries are articulated in economic as well as human development terms. Whilst this would no doubt impact on the future of South African smart city discourses, this falls outside the scope this research, that focused on the period from 2005 to 2018. The lack of a coherent smart city strategy at national level is as much due to the constitutional framing of its role (where city development is seen as a local government mandate) as it is about its own preoccupation with more pressing socio-economic concerns in the face of increasing populism and pressure from the political left. Its 4IR plans are however predicated on partnerships with multinational corporations with an emphasis on foreign direct investment (Sutherland, 2020). Whilst national policy is no doubt

committed to its job-creation aims through technology deployment, implementation of the smart city idea as a spatial entity, would need to be, and has been, driven by local government.

Municipalities are autonomous and are largely responsible for generating their own budgets. This decentralized system is political (with separate local government elections), financial and ideological. Local government is mandated to be developmental as the state apparatus ‘closest to the people’ and responsible for service delivery as well as local economic development (RSA, 1996). Furthermore, municipal legislation includes stringent procedures for enabling a participatory democracy and collaborative plan-making (RSA, 2000). In addition to that, convoluted procurement procedures and stringent anti-corruption measures constrain top-down and/or corporate-led urban development and would need to be budgeted for and agreed to in municipal planning processes. This serves as an important contextual feature when surfacing how smart city discourses assemble locally.

5. Transnational connections and the national rollout of smart city logics in South Africa

Our analysis examined two scales: national and local. At national scale we focused on lexical change, asking the question: what are the terms used concerning ICT-mediated forms of urban development between 2005 and 2018, and how do they evolve? Then we studied the actors and interventions associated with these shifts, asking: are these changes in lexicon associated with different actors or actor constellations and with different types of interventions? In other words, is the smart city a pure label in South Africa, an ‘empty rhetoric’ (Wiig, 2015a), or does it relate to changes in urban development processes?

The analysis of our data shows how the logics of ICT-mediated governance and developmentalism is articulated in the South African mediascape. Nationally, the ‘digital city’ language was more dominant in earlier reporting (2005 to 2008) with the use of the term ‘smart city’ increasing in subsequent years (2009 to 2018). This is consistent with other studies on a global scale showing the use of ‘smart city’ is less prominent before 2009 (Joss et al., 2019, 9). The emphasis also reflects an emphasis on the functionality of ICT as a governance tool in enabling larger developmental goals (Odendaal, 2003).

5.1. Lexical shifts from the digital (2005 – 2008) to the smart city (2009 – 2018)

Fig. 1 indicates these shifts, with the ‘digital city’ narrative most prominent from 2005 to 2008 (50% of media reports) and a decline of the use of the term to 19% in the 2014–2018 period. The use of the term ‘smart city’ increased from 35% in the 2005–2008 period to 67% from 2014 to 2018. These lexical shifts correspond to policy trends at the national scale, reflecting the developmental aim of reducing the ‘digital divide’ through publicly accessible and affordable broadband internet: “ICT offer huge potential for overcoming poverty and facilitating economic growth and development” (Tubbs, 2015). It was during this first phase that the national government offered policy and regulatory support to municipalities, following the first local government elections in 2000. The emphasis on municipal broadband backbone infrastructure and ICT capacity to support these systems, was intended to enable ICT access, in keeping with the national emphasis on capacity building and skills development.

The national shift to the use of the term ‘smart city’ from 2009 to 2013 period is well encapsulated in a report from 2010 describing IBM’s intention for the South African smart city: “ensuring the efficient use of technology across areas such as water, traffic, security, telecommunications, banking and energy management” (Mochiko, 2010). It reflects a national emphasis on infrastructure deployment for economic growth, international trends towards corporate involvement in city governance and technology convergence (Odendaal, 2016b). Whereas the early emphasis on the ‘digital city’ was largely concerned with enabled socio-

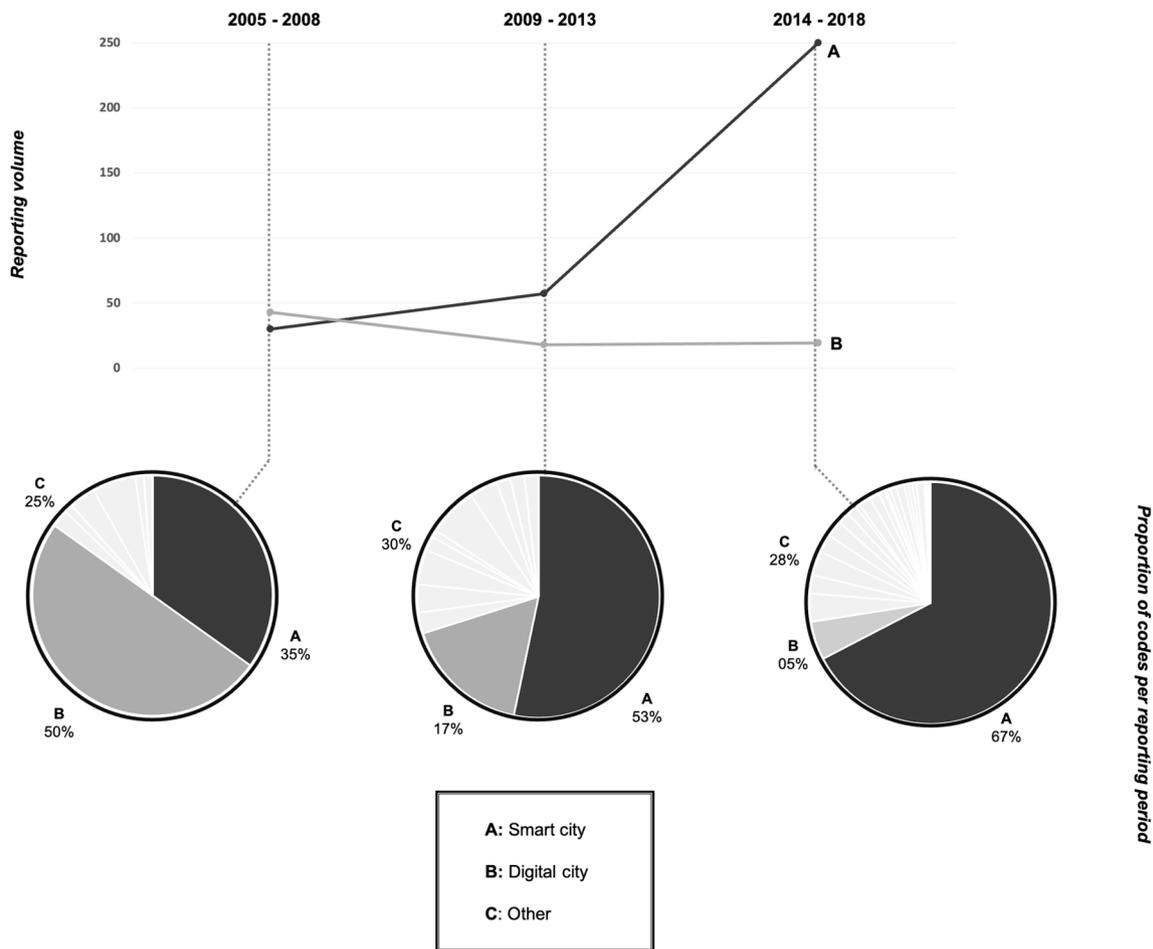


Fig. 1. Digital/smart city lexicon shifts at a national scale.

economic development through the deployment of backbone telecommunications infrastructure, the ‘smart city’ denotes a series of systems capable of being delineated and objectively understood: “data will give greater insight into what makes each city tick, what works and what doesn’t, and most importantly, it will enable us to determine what is possible in the future... the kind of information needed will be intricate and incorporate all sectors of the city - from water and energy to air quality, lighting, transport, unemployment, security and economic growth” (Dall’Omo, 2018). The lexical shift from digital to smart in South Africa is thus not anecdotal: it corresponds to a framing of urban development as a system of data-powered systems, characteristic of a corporate cybernetic vision of the smart city (Townsend 2013).

An international gaze is discernable as reflected in the literature (Heese and Allan, 2018); as is the foregrounding of private sector solutions for service delivery (Moyo, 2012; Tubbs, 2015). This gradual embrace of smart city corporate storytelling (Söderström et al., 2014) taking place in South Africa at the end of the 2000 s also corresponds to a shift from the local government-driven infrastructure projects such as broadband in informal settlements, to public–private partnerships using ICT to radically transform urban governance. As Oracle Corporation puts it, it is the ‘evolution’ from ‘e-governance’ towards ‘t-governance’, or transformational governance: creating the environment for “not only the automation of existing processes, but also the transformation of business processes and the organization... encourage[ing] the adoption of new radical ways of deploying ICT in the pursuit of policy objectives” (Francis, 2009).

Progressively ‘bridging the digital divide’ becomes entangled with a toolbox of a wider range of integrated ICT solutions, made possible through the collaboration of both the public and private spheres (Tubbs,

2015), including the “adoption of cloud computing, social media, mobile technology, television, the Internet of Things and telecommunications” (James, 2016). In the following sections, we will see how this reframing of urban development narratives go hand in hand with changes in the types of actors and interventions involved.

5.2. Public-private actor enmeshment through the logics of the smart city

The most prevalent actor across all reporting periods is local government. Fig. 2 demonstrates that local government remains the key actor, as service provider and as the developmental arm of the state. National government is not as significant throughout the 2005 to 2018 period. In their discursive analysis from 27 cities worldwide, Joss et al. (2019, 13) also find a strong and sustained presence of local government where municipalities are necessary regulatory gate keepers and executing agents of smart city agendas. South African cities are similarly compelled to negotiate the tension between deregulatory smart city logics and public service delivery.

The role of the private sector is sustained from 2005 to 2018, with spikes in reporting concerning the role of international corporates during the 2009 to 2013 period, where deregulated public–private partnerships and international corporate interest in South Africa increase. Corporate actors include: Cisco (Naidoo, 2018), Oracle (Francis, 2009), SAP (Staff reporter Sunday World, 2014; SAP, 2013) and IBM (Mochiko, 2010). Largely the media emphasis is on ICT backbone infrastructure deployment and internal database management systems development for municipalities. Failed public–private partnerships were subsequently reported, such as that between the City of Johannesburg and Ericsson to rollout an integrated, telecommunications infrastructures network in

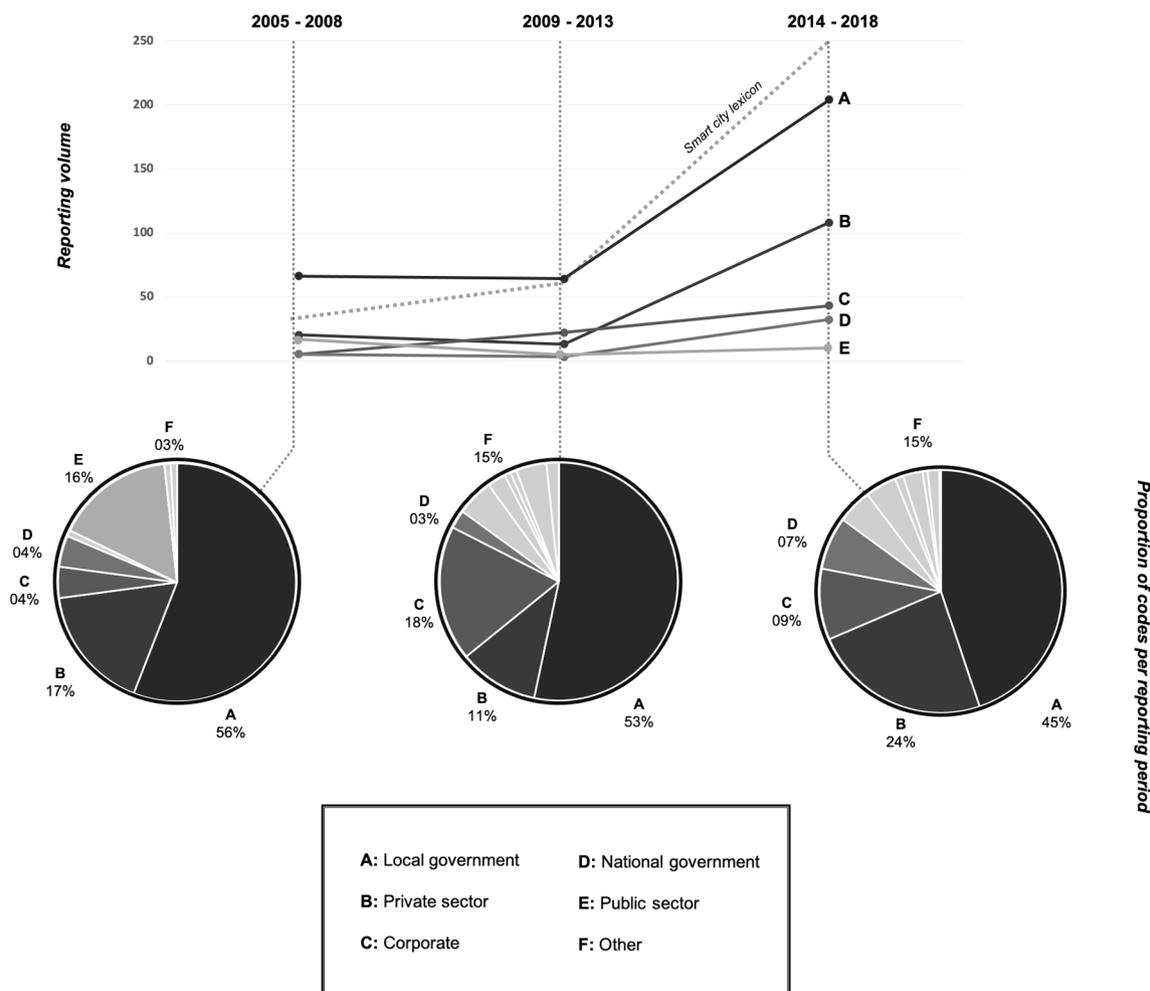


Fig. 2. Actor presences and the smart city at a national scale.

2010 that ultimately resulted in the City having to buy the contract out for upwards of 75 million USD after multiple project stalls (Serumula, 2015). This spike in international interest reflects trends towards use of best practice models and associated policy mobilities in South African cities (Harrison, 2015; Robinson, 2015).

Narratives regarding public–private arrangements around smartification are largely presented as positive, suggesting that the public–private arena is critical for generating spaces through which global currents of smart are to be translated and executed as developmental priorities of the State. Private sector actors - operating under both the digital city and smart city lexicon umbrellas - discursively emerge as the envoys of international best practice for ICT-driven economic development. Private industry becomes the engine driving transnational connections, delivering the smart city as a mobile policy onto the shores of South Africa. State actors are cast in a translator role, evaluating and executing on smart-related private sector investment pressures, as filtered through policy lenses and governance mandates. However, the logics of the smart city differ from the digital city in how these relations are intensified through transnational influence and the persistent rhetoric of deregulation. The analysis of our data demonstrates that the increased volume of engagement around ‘smart’ correlates with discussions on public–private interactions and issues requiring urgent attention. In contrast, government regulation and public-funded operations are increasingly presented in media discourse as a persistent obstacle to racially inclusive transformation in the sector (Scott, 2018), offering weak policy frameworks that have not evolved in line with the current state of the industry (Mzekandaba, 2016) and establishing an

uncompetitive market environment (Scott, 2005a). In summary, transnational connections, established by private industry, is a dominant engine of the roll-out of the smart city narrative in South Africa at the end of the first decade of the century. In a context where ICT-driven urban development was initially a State-led policy aiming to close the digital divide, the smart city foregrounds private sector actors and, as we show below, the datafication of urban development.

5.3. Datafication of urban policy framing under the logics of smart

The diversification of actors involved in ICT related urban developments is paralleled by a diversification of the types of interventions between 2005 and 2018. ICT progressively permeates interventions regarding housing, water, electricity and sanitation. Fig. 3 shows that the proportion of infrastructure interventions begin to decrease as the smart city lexicon develops. These smart city interventions emerging since 2009 cover economic development and investment potential in municipal regions – and how this potential could be better mediated through government support for ICT and innovation related industries, strategic partnerships and sourcing funding between public and private actors, ‘ICT & data capacity building’ and ‘monitoring & evaluation and urban management’. The two latter interventions are interrelated and intended to improve internal municipal efficiencies. ICT capacity building is closely linked to the continuous development of eGovernance, evolving in scope and definition in the shift from digital city to smart city.

The emphasis on municipal indicator-based monitoring in South

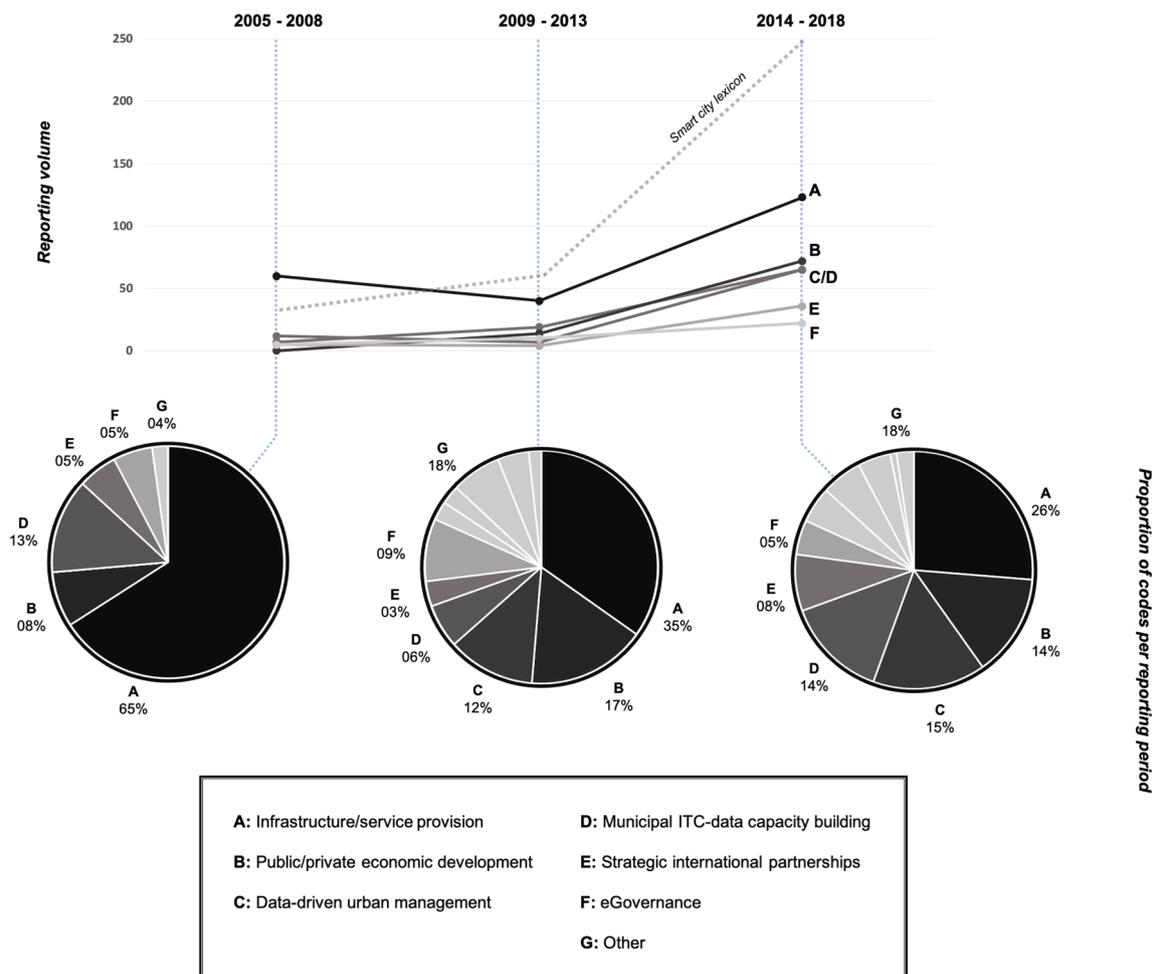


Fig. 3. Intervention diversification and the smart city at a national scale.

African municipal legislation fits well with international shifts towards data-driven urban management (Odendaal, 2019). ICT integrated decision-making systems become the means whereby public-private partnerships are realised. The integration of SAP into the operational execution of the city of Cape Town offers an example of such public-private partnerships. What began as an enterprise resource management platform (ERP) for database-driven decision-making systems has evolved into a live-feed urban management system, fully integrated with private-sector technologies and support mechanisms similar to control centers elsewhere (Prowse, 2016; SAP, 2013). Thus, if ICT infrastructures remain important as interventions navigating under the smart city flag, the central process with regards to former digital city policies is a diversification of interventions stitched or glued together by this now predominant smart city narrative. In other words, the lexical change, the turn to ‘smart’, works as a vehicle for the datafication of an expanding range of urban development questions: it frames them as a data question.

5.4. Interrelated drivers of the rollout of the smart city

This shift in interventions speaks to the smart city as a set of logics within ICT mediated governance. Whilst ‘Digital city’ framed interventions (in the domain of infrastructure, in particular) persist, what we observe is an enmeshment of different types of interventions and actors under the smart city umbrella. Despite the increased range of actors implicated in the smart city media ‘story’, the role of government actors has not become diluted by the rollout of the smart city. The persistence of government actors’ presence across interventions in the

mediascape speaks to the essential roles that national and local government play in the localised conveyance of smart city.

In particular, municipal agency has in South Africa become increasingly involved since 2005 with actors and interventions around surveillance-led ‘smart’ security, innovation incubation for small and micro entrepreneurial enterprises, and digital citizen development. Under the logics of the smart city, private and public actors become more closely intertwined; not just through negotiations concerning infrastructure but more so through the deregulated private sphere integration into the sourcing, deploying, servicing and training of technologies infused into a form of database-driven governance. In summary, our research shows at national level that the smart city effect is not purely lexical where the term smart city would be an empty signifier (Wiig, 2015a): it corresponds to a neoliberal digital shift where governance through data is operated by public-private partnerships. However, as the next section shows, this trend manifests unevenly geographically. It happens at different moments and takes different forms in the country’s major urban regions. What we find is that the smart city effect is shaped both by transnational connections and ‘cosmopolitanisation as “globalization internalized” in specific settings’ (Blok, 2020, 509).

6. When mobile policies meet globalization from within

The national scale seems to demonstrate a singular logic of smart that is rolled out across the country. However, our research shows key variances between South African cities, not only in terms of the time period in which cities adopt the lexicon of the smart city but also in how its

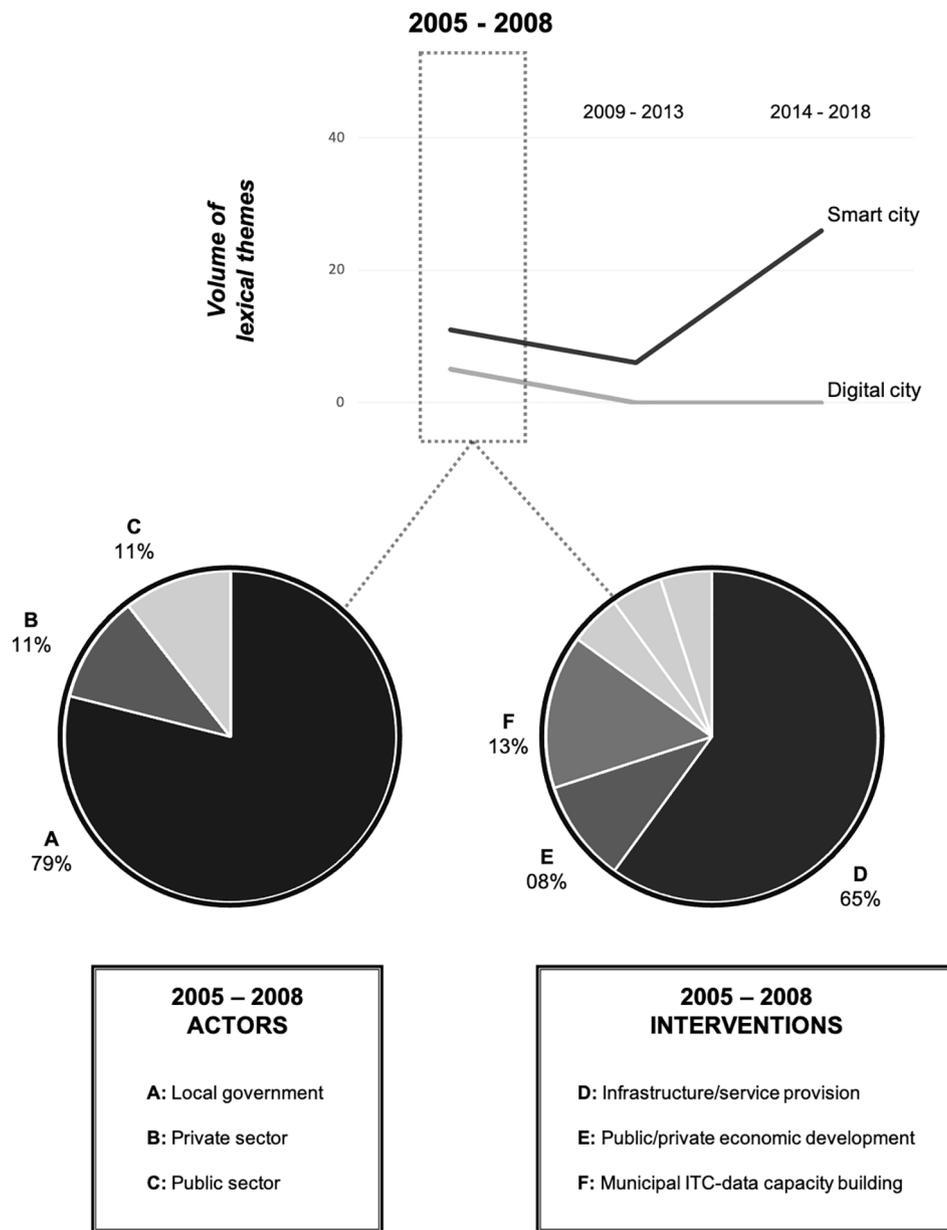


Fig. 4. Early smart city period actor and intervention composition in eThekweni.

logics are contextually shaped. Despite the unevenness in the take-up of the smart city, this contextual approach reveals a consistent logic of actor assemblages playing out across geographic scales. The interplay between private and public actors within South African cities offers a point of entry through which global inspirations and best practices enter local discourse, become contextualized through economic development and policy priorities of local government and subsequently become realised as place-specific agendas and interventions. This place-specificity of the smart city is explored by a more careful examination of eThekweni (Durban), Johannesburg and Ekurhuleni.⁵ Each city is characterised since 2005 by a distinct way of handling the deployment of the smart city narrative: reverse-scale policymaking, labelling and territorialization.

⁵ The analysis offered in this section is built from the cross comparison of codes specific to each locale. This analysis was further supported by investigations into national and local-scale smart-related policy related to specific periods of each selected city.

6.1. eThekweni: A testbed for the South African smart city

eThekweni (Durban) is the third largest metropolitan region in South Africa, after Johannesburg and Cape Town. It is an early adopter of the smart city lexicon (see Fig. 4). Rather than the shift in logics described at a national level, media reports on eThekweni describe an articulation between the digital city and the smart city logic. This articulation shapes the policy interface between equitable infrastructure and market forces, where local policy agendas are intertwined with the developmental power of ICT (Odendaal, 2003). This is also present in other cities (Cape Town, Johannesburg and Ekurhuleni for example), but eThekweni labelled these logics distinctively as ‘smart’ much earlier, emphasizing the need to “commercialise its extensive fibre optic cable network with a private sector partner and start the rollout of cheaper broadband and telecommunication services to local business and citizens as early as next year [i.e. 2007], barring any constitutional obstacles” (Naidoo, 2007).

The ‘digital divide’ narratives that are otherwise commonplace in national-level reporting and in other cities are not present in eThekweni.

This is significant as digital city and digital divide narratives were adapted by municipalities via nationally influenced policy discourse. Although citizens are thematised in eThekweni's mediascape during this period (Moolla, 2008), the benefit of smart city initiatives is to be delivered downstream through economic growth (Naidoo, 2007) or deregulatory measures to improve connectivity (Naidoo, 2008a) rather than through direct public investment. Such a distinction between eThekweni and other cities is further reinforced by comments from the eThekweni head of Geographic Information and Policy, stating that “the big bang will come when we get to commercialise this network with a private sector partner via a joint-venture” (Moolla, 2008). In other words, the ICT governance logics of eThekweni is defined not in terms of equitable access to infrastructures but through an overt narrative of market-led economic and investment growth driven through ICT.

This suggests that the smart city as a logic can be adopted at a local scale without a nationally influenced direction to shape this adoption, as is the case with the digital city and the digital divide narrative. Media reports show that this adoption was enabled not through the national government, but through public–private partnerships and local state-supported ICT-driven business incubators (Le Guern, 2014). These mechanisms seem to have served as vehicles through which the smart city narrative entered into governance in eThekweni. The state-supported SmartXchange business incubator, for example, defines itself as “the vehicle that is driving the vision of Durban becoming the ICT (information communication technology) hub of Africa... this industry forum has dedicated time and energy to making the city's dream of affordable broadband a reality” (Naidoo, 2008b). These public–private vehicles also pull the national government into the fray as they articulate early points of regulatory friction in establishing partnership-driven ICT-mediated development. Discussing eThekweni in terms of bottlenecks to serving public–private interests, the national deputy communications minister for instance stated in 2007 that “the high cost enabling citizens to gain access to fast, content-rich telecommunication services continues to be a major hindrance... there are some legal and regulatory implications for digitised cities that need to be addressed” (Naidoo, 2007).

Such acknowledgements from national government actors suggest that, during this period, the smart city was not directed by national mandates but shaped by municipal governments as they develop their own policy approaches. Localised policy becomes necessary to negotiate bureaucratic hurdles that surface when local government objectives run counter to regulations implemented by higher scales of government. eThekweni, in this instance, serves as a case study for the national government through which the operationalisation of the private–public logics of the South African smart city are tested first at the local scale, bringing to the fore particular regulatory tensions that would necessitate intervention through national policy shifts to move local development agendas forward. This form of globalization from within thus works as a reverse-scale policymaking where municipal initiatives push the transformation of national regulations rather than adapt them to local circumstances.

6.2. Smart city as labelling in Johannesburg

Johannesburg is the largest metropolitan area of South Africa, forming the centre of the Gauteng City Region. Media reports on the city represents the most significant volume increase in the deployment of the smart city lexicon in the South African mediascape (See Fig. 5). Reporting during the 2014 to 2018 period has clear antecedents in the digital city discourse that preceded it. For example, the Joburg Broadband Network Project has existed in some form since 2007 where the municipal government entered a process of establishing a suitable regulatory environment to allow public–private partnerships to successfully manifest (Scott, 2005b; Senne and Czernowalow, 2007). The project defined itself as a digital city initiative, aiming to “increase the penetration of broadband ICT access in under-served areas... and reduce

the digital divide” and that such a network would “solidify Johannesburg's image as an investment-friendly city with a world-class ICT infrastructure that is bound to stimulate job growth and therefore boost the economy” (Ericsson, 2009). Delivery of this vision was seen to necessitate the partnering with the private sector due to issues of the anticipated scale of delivery and municipal capacity. Such partnerships with the private sector under the logics of the digital city were thus not necessarily focused on the broader deregulation of the governance space but were initiated with a specific purpose towards the delivery of a distinctly State-driven project.

The volume of reporting around ICT-mediated governance and development spiked significantly in Johannesburg during 2014 and 2015, framed under the smart city lexicon instead of the digital city. Despite this change, the focus on a State-driven infrastructure was retained throughout reporting with a clearly defined role for local government. This uptake of the smart city in Johannesburg between 2014 and 2018 is related to a consistent directive from Parks Tau, the mayor of Johannesburg from 2011 to 2016, to propel a smart city vision at a rapid pace. This coincides with two phenomena: the mayoral drive towards international networks and initiatives including Johannesburg's hosting of the C40 Mayor's Summit (Staff reporter Targeted News Service, 2013) and collaboration with the Zero Emissions Research and Initiative to produce smart, blue economic interventions for the city (Tau, 2018) as well as increased partnerships with international companies including IBM (Malinga, 2016) and Microsoft (Microsoft, 2015). However, media reports on the Johannesburg smart city still demonstrate a primary focus on infrastructure and ICT-mediated urban management led by municipal government.

The local appropriation and remaking of international discourses are evident when considering the *Joburg Broadband Network Project*. Whilst initially aimed at publicly accessible Wi-Fi, it later was rebranded as a keystone project under Johannesburg's new smart city vision. Further, the Johannesburg case study offers insight into the considerable influence political leadership hold as passage points. In the case of Johannesburg, the influence of a senior politician with a vision for ICT in developmental governance such as Tau demonstrates how the term smart city is enrolled to rebrand policies that were already in place. Tau's attitude to the smart city demonstrates an approach that, although technology-centered, is underpinned by an acknowledgement of local context: “My view about the Smart Cities concept is that it is a smart city to meet your own objectives and that we shouldn't replicate the work that has been done in European or American cities. They need to be smart for our own objective. They need to deal with our own issues. It is about adapting technology to help us meet our own needs and that's how we have to approach Smart Cities... Smart Cities are about smart governance in your own environment” (UCLGAfrica, 2016). The evolving smart city narrative in Johannesburg thus does not necessarily represent a shift in the fundamental logics of Johannesburg's ICT-mediated governance. It functions as a label, strategically deployed when confronted with the operational realities of urban development in the city, and matched with the vision-making of an internationally connected, smart-savvy mayor.

6.3. The territorialisation of the smart city in Ekurhuleni

The policy context for smart cities, discussed above, and evident in the discussion of eThekweni, reveals growing recognition of the convergence of ICT and other utilities. Inevitably this leads to a confluence of policy discourses, such as the aerotropolis narrative in Ekurhuleni, where O.R. Tambo International, the country's (and the Southern African Development Community region's) main airport is located, in the eastern Gauteng City Region. Coined by Kasarda (Kasarda, 2013, 2015), the term ‘aerotropolis’ resonates in South Africa with its promise of local economic development through the harnessing of international air travel and local network connectivity (Rogerson, 2018). Ekurhuleni's aerotropolis is described as containing “First World

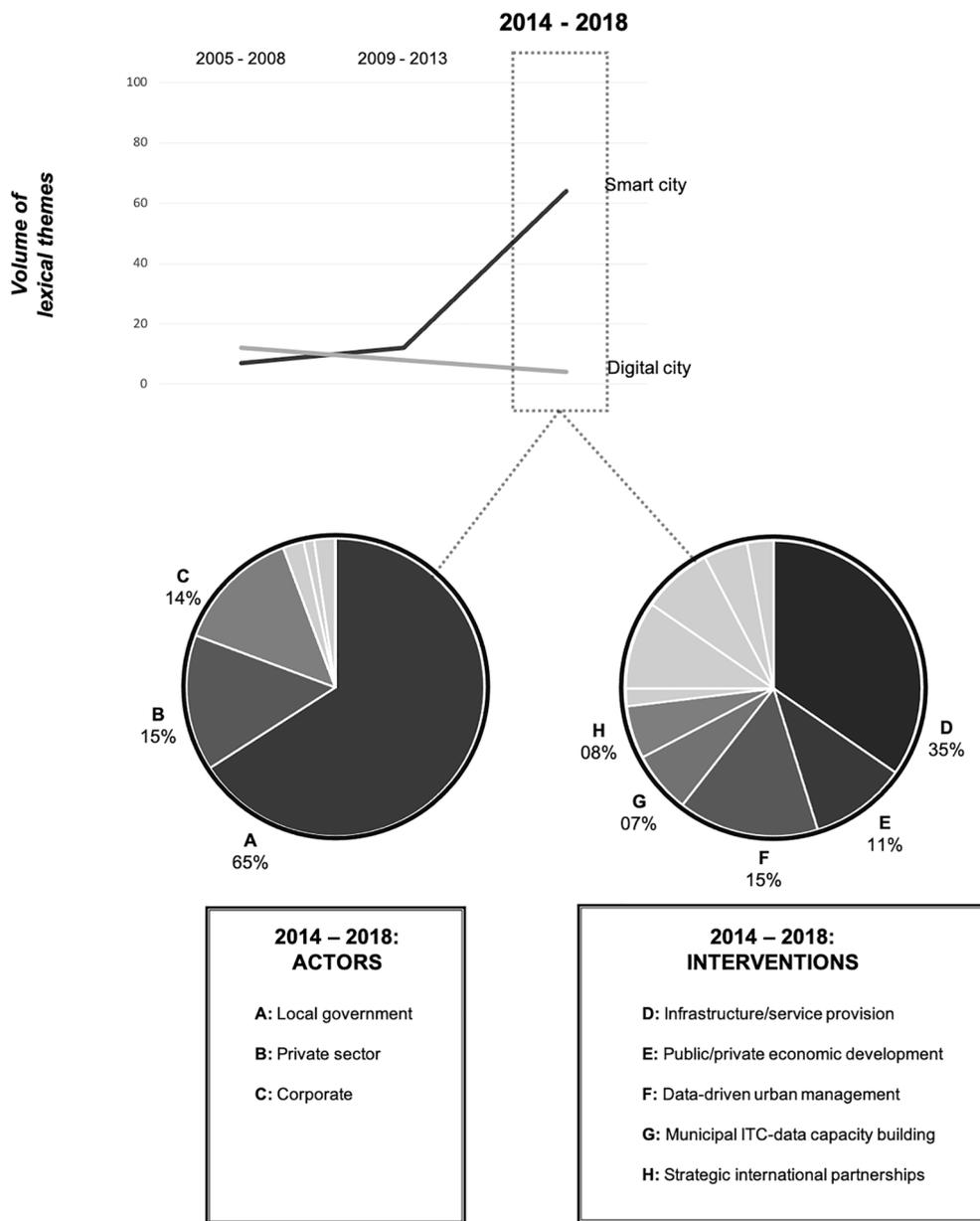


Fig. 5. Late period smart city spike and associated interventions and actor composition in Johannesburg.

features... bound to rival the best in the world: a rail, road and air infrastructure that makes mobility agile, quick, reliable and accessible; a digital city that attracts the best companies in the world; accommodation, office and related real estate infrastructure that makes the most discerning executives feel at home” (Staff reporter Mail & Guardian, 2011). The emergence of the aerotropolis narrative between 2009 and 2013 shows how smart city logics adapt to a territorial context, characterised by the presence of a major international airport and a logistics hub (see Fig. 6). The aerotropolis is positioned as a decidedly State-driven catalyst for a particular urban form that spatialises distinct nodes for economic development, including “aviation-intensive transport, telecommunication, accommodation, commercial, logistics, industry and related enterprises... entail[ing] investment on new economic infrastructure to support logistics, distribution and related green industries” (Staff reporter Mail & Guardian, 2011). Utilising the position of the airport and downstream industries, the aerotropolis establishes a logic through which ICT-based airport-focused strategies can generate economic growth. ICT backbone infrastructure traces the flows of just-in-time logistics streaming in and out the airport and its

surrounding transport hubs, and generates spatial and investment ‘hooks’ for ICT-oriented industries to take root and receive benefit from proximity to the airport.

The city’s digital city vision continued with some prominence into the 2009 to 2013 period alongside the aerotropolis idea. The digital city vision for Ekurhuleni was conceived as eGovernance-focused: a means to better develop internal government ICT capacities and to create a digital front to expedite service delivery to constituents (Staff reporter ITWeb Informatica, 2009). It was primarily a public-focused operation concerned with the mundane logistics of governance. As in eThekweni the logics of the smart city merged into this previously established digital city logic through public-private partnership focused interventions. In this context the local government is to “continue to maintain [a] high standard of service delivery in not only the previously advantaged areas but also the cities... services need to be developed that are reliable to the clientele of the municipality. From these profits, the funds can be redirected to uplift less privileged areas” (Staff reporter Mail & Guardian, 2011).

The vision of the aerotropolis is stated by the Ekurhuleni municipal

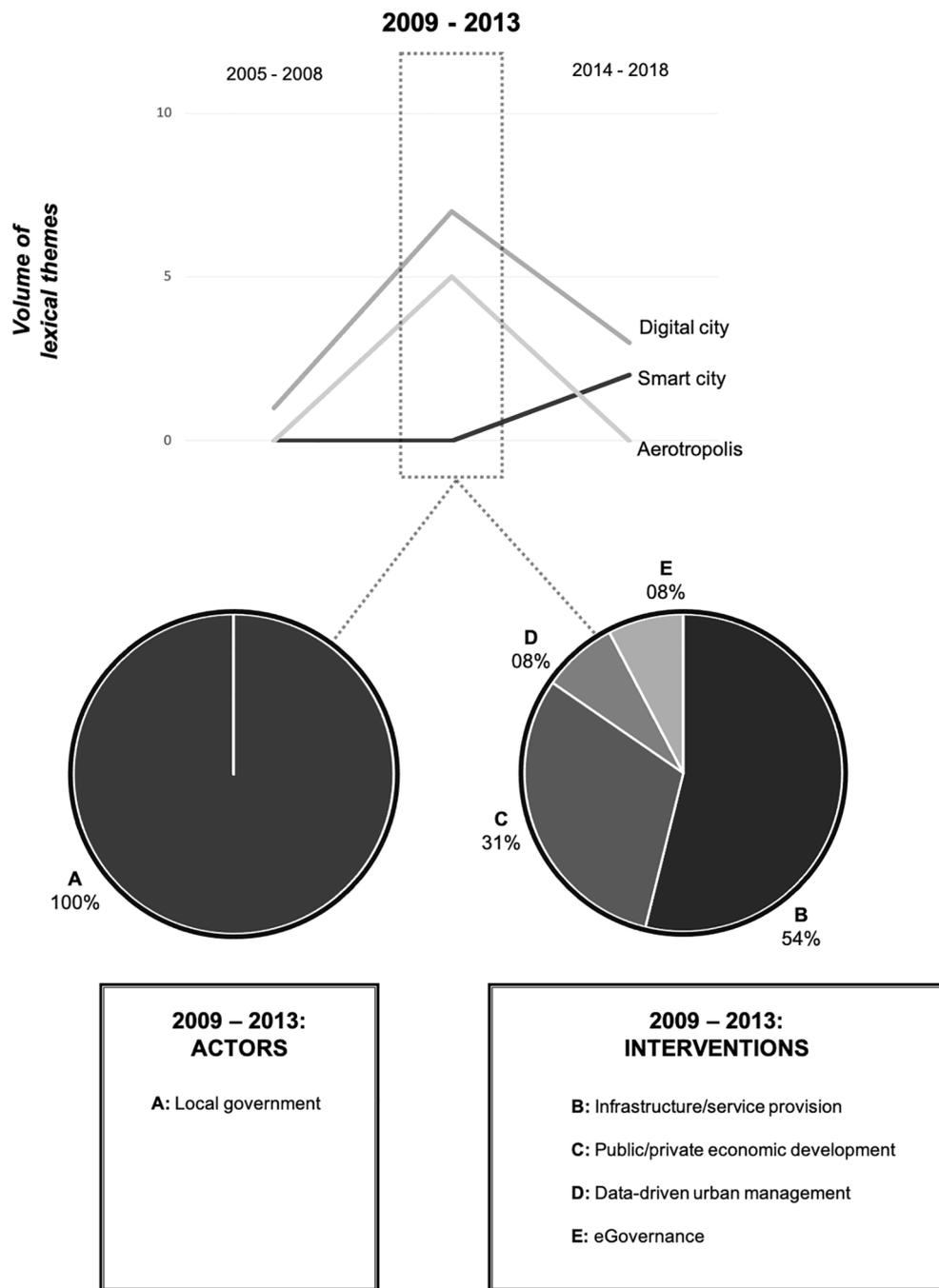


Fig. 6. Actor-intervention composition around the Aerotropolis and digital city in Ekurhuleni.

government as “using inter-modal connectivity as the basis for generating economic development... This would require an innovative use of land, logistics, human resources, investment capital, innovation and entrepreneurship to create connections with new markets and sources of revenue” (Ekurhuleni, 2019). The airport thus becomes a focal point through which different discourses coalesce around a regional, economic development priority. The smart city via the aerotropolis serves as a lexical umbrella for the Ekurhuleni municipal government, bringing into its fold previous attempts at ICT-mediated governance and revitalizing them with market-oriented language. The deployment of smart city discourses does not necessarily shift the mandate of local government away from post-apartheid socio-economic developmental priorities. However, in the face of resource and capacity constraints, the concept offers an alluring neoliberal remedy for beleaguered local

governments to address regional social and economic development via ‘redirected’ downstream benefits.

The three cities - eThekweni, Johannesburg and Ekurhuleni - display an array of discourse constellations that speak to particular geographic features informing smart city appropriations. Yet, the narrative evolution from digital city to smart city, reflects national policy emphases such as sectoral specialization (reflecting broader trends towards infrastructure convergence) and the continued balancing act between business interventions and state-led development. A solid legislative framework places the municipality at the forefront of socio-economic development and protects citizens from over-zealous corporate meddling. Yet, resource constraints and capacity limitations do not make them immune to the economic promises of the smart city, where political agendas and international narratives align (Johannesburg) and

discourses coalesce (Ekurhuleni). Based on our national scale analysis and a focus on three major municipalities, our analysis shows that the smart city effect in South Africa consists both of the roll-out of neoliberal logics of private–public partnerships and place-specific ways of appropriating the smart city narrative.

7. Conclusion

It is tempting to simply relegate the smart city narrative to the list of policy mobility experiences exported to the global South. However, as we argue in the early part of this paper, these relations of exteriority preclude an analysis of regional policy circulations and contextual appropriation. A cosmopolitanisation approach enables analysis from within specific places (Beck, 2011), where cities “are never reducible to either place-based or *trans*-boundary forces and factors” (Blok, 2020, 509). Thus, this paper suggests, through its examination of the South African, that the globalization of the smart city results from the dialectic relations between transnational policy connections and municipal strategies which are themselves, as we have seen, more-than-local. Due to its political system that gives, in international comparison, local government a wide autonomy, South Africa constitutes a relevant context to observe the combination of these logics of urban policy globalization.

Applied to a media-analysis, the analytical framework we have suggested allows us to show that there has been since 2005 not one but a variety of smart city effects in South Africa. The clear reframing of data-driven urban policies as ‘smart’ during the past twenty years corresponds to a shift from State-driven infrastructure projects to public–private partnerships to transform urban governance through the intensive mobilisation of data. Thus, when we look at national trends and the role of transnational corporate connections, the South African smart city phenomenon appears as more than a labeling game: it works as a vehicle for – and a lexical glue to hold together processes of – digital neoliberalisation. Digital companies are the drivers of the roll-out of a smart city narrative promoting the datafication of all sectors of urban development and where State actors are cast in a role of translator or enabler. This is not surprising and corresponds to early critical analyses of the smart city (Hollands, 2008). However, when we tilt the perspective and look at the same process from inside the municipalities, a more uneven geography and other smart city effects appear. These differences are related to a political system in South Africa, rather unusual in the Global South, where municipalities have a large autonomy. eThekweni has worked as a testbed for public–private partnerships in ICT-driven urban strategies independently of national policies, ‘smart city’ has been used as a convenient label to continue urban-policy-as-usual in Johannesburg and the municipality of Ekurhuleni has moored the smart city narrative in the specificity of its territory, hybridizing it with the model of the aerotropolis. Thus, these municipal strategies are not simply territorialising a global narrative that would somehow land in a locale. They strategically use the global trope of the smart city to justify or support the continuation or transformation of their strategies.

More broadly, our analysis speaks to the forms of relations that shape global urban policymaking today. Since their early days, policy mobility studies have argued that ‘policies move as they move’ (Clarke, 2012): they result from a combination of relation-makings and territorialisations (McCann and Ward, 2010). This approach has helped to trace the agents, actions, places, material intermediaries, movements of the relational and territorial geographies shaping contemporary urban policymaking. With time, the repertoire of approaches and perspectives has been widened to include less traceable processes or ‘loose threads’ (Söderström and Geertman, 2013a) involved in shaping urban policies. Gradually the idea, already undermined by McCann and Ward (2010), of a boundary between an interior and an exterior has been dissolving. This is not only an effect of the use of alternative approaches in urban studies, such as worlding, but also an index of an intensification of the globalization of policymaking. The smart city, the most ubiquitous urban development narrative today, is particularly telling in this context.

When it is not framed and controlled by a centralized government like the Indian Smart City Mission, it is neither ‘out there’ or ‘in here’, but at hand everywhere. This is related to the fact, as we have argued in this paper, that, like other global urban policies such as ‘the green city’ or ‘the resilient city’, it remains very much a discourse, malleable but not empty, as it always refers to the intensive use of technologies and data in urban development (Kitchin, 2015).

Declaration of Competing Interest

The authors declared that there is no conflict of interest.

Acknowledgements

This work was supported by the Swiss National Science Foundation under Grant 10001AM_173332.

The authors would like to thank two anonymous referees and the Editor, Geoffrey DeVerteuil, for their very helpful comments on a first version of this paper.

References

- Allen, J., Cochrane, A., 2010. Assemblages of state power: topological shifts in the organization of government and politics. *Antipode* 42 (5), 1071–1089.
- Allwinkle, S., Cruickshank, P., 2011. Creating smart-er cities: An overview. *Journal of Urban Technology* 18 (2), 1–16.
- Andersson, I., Cook, I.R., 2019. Conferences, award ceremonies and the showcasing of ‘best practice’: A case study of the annual European Week of Regions and Cities in Brussels. *Environment and Planning C: Politics and Space* 37 (8), 1361–1379.
- Angelo, H., Vormann, B., 2018. Long waves of urban reform: Putting the smart city in its place. *City* 22 (5–6), 782–800.
- Bakici, T., Almirall, E., Wareham, J., 2012. A smart city initiative: the case of Barcelona. *J. Knowledge Economy* 1–14.
- Ballard, R., Harrison, P., 2020. Transnational urbanism interrupted: a Chinese developer’s attempts to secure approval to build the ‘New York of Africa’ at Modderfontein, Johannesburg. *Environ. Plann. A: Econ. Space* 52 (2), 383–402. <https://doi.org/10.1177/0308518X19853277>.
- Beck, U., 2004. Cosmopolitan realism: On the distinction between cosmopolitanism in philosophy and the social sciences. *Global Networks* 4 (2), 131–156.
- Beck, U., 2006. *Cosmopolitan vision*. Polity Press, London.
- Beck, U., 2011. We do not live in an age of cosmopolitanism but in an age of cosmopolitanisation: The ‘global other’ is in our midst. *Irish J. Sociology* 19 (1), 16–34.
- Beck, U., Giddens, A., Lash, S., 1994. *Reflexive modernization: Politics, tradition and aesthetics in the modern social order*. Stanford University Press, Stanford.
- Beck, U., Sznajder, N., 2006. Unpacking cosmopolitanism for the social sciences: a research agenda. *British J. Sociology* 57 (1), 1–23.
- Blok, A., 2012. Greening cosmopolitan urbanism? On the transnational mobility of low-carbon formats in Northern European and East Asian cities. *Environment and Planning A* 44 (10), 2327–2343.
- Blok, A., 2016. Urban climate risk communities: East Asian world cities as cosmopolitan spaces of collective action? *Theory. Culture & Society* 33 (7–8), 271–279.
- Blok, A., 2020. Climate riskscape in world port cities: situating urban-cosmopolitan risk communities via Ulrich Beck’s comparative tactics. *Global Networks* 20 (3), 500–521.
- Burns, R., Fast, V., Levenda, A., Miller, B., 2021. Smart cities: Between worlding and provincialising. *Urban studies* 58 (3), 461–470.
- Caragliu, A., Del Bo, C., Nijkamp, P., 2011. Smart cities in Europe. *J. Urban Technology* 18 (2), 65–82.
- Clarke, N., 2012. Urban policy mobility, anti-politics, and histories of the transnational municipal movement. *Prog. Hum. Geogr.* 36 (1), 25–43.
- Cook, I.R., Ward, K., 2011. Trans-urban networks of learning, mega events and policy tourism: The case of Manchester’s Commonwealth and Olympic Games projects. *Urban Studies* 48 (12), 2519–2535.
- Cook, I.R., Ward, K., 2012. Conferences, informational infrastructures and mobile policies: the process of getting Sweden ‘BID ready’. *Eur. Urban Reg. Stud.* 19 (2), 137–152.
- Crivello, S., 2015. Urban policy mobilities: the case of Turin as a smart city. *European Planning Studies* 23 (5), 909–921.
- Dall’Omo, S., 2018. *Africa leaps into the future*. Cape Argus.
- Datta, A., 2015. New urban utopias of postcolonial India ‘Entrepreneurial urbanization’ in Dholera smart city Gujarat. *Dialogues in Human Geography* 5 (1), 3–22.
- Datta, A., 2019. Postcolonial urban futures: Imagining and governing India’s smart urban age. *Environment and Planning D: Society and Space* 37 (3), 393–410.
- Deakin, M., 2014. *Smart cities: governing, modelling and analysing the transition*. Routledge, London.
- DeVerteuil, G., Yun, O., Choi, C., 2019. Between the cosmopolitan and the parochial: the immigrant gentrifier in Koreatown. *Los Angeles. Social & Cultural Geography* 20 (1), 64–86.

- Didier, S., Peyroux, E., Morange, M., 2012. The spreading of the city improvement district model in Johannesburg and Cape Town: urban regeneration and the neoliberal agenda in South Africa. *International Journal of Urban and Regional Research Article first published online: 22 MAR 2012*.
- Ekurhuleni, C.O., 2019. *Ekurhuleni Aerotropolis*. City of Ekurhuleni.
- Ericsson, 2009. Joburg kicks off digital project, ITWeb Online.
- Farias, I., Mendes, C., 2019. A smart equivocation. Co-laboration and subsidiarity in a smart city consortium. In: Karvonen, A., Cugurullo, F., Caprotti, F. (Eds.), *Inside Smart Cities*. Routledge, London, pp. 182–196.
- Fischedick, I.M., 2012. Smart City-Schritte auf dem Weg zu einer CO2-armen Stadt. *Smart Energy*. Springer 395–414.
- Francis, L., 2009. From e-govt to t-govt, ITWeb Online.
- González, S., 2011. Bilbao and Barcelona 'in motion'. How urban regeneration 'models' travel and mutate in the global flows of policy tourism. *Urban studies* 48 (7), 1397–1418.
- Guma, P.K., 2019. Smart urbanism? ICTs for water and electricity supply in Nairobi. *Urban studies* 56 (11), 2333–2352.
- Haarstad, H., Wathne, M.W., 2019. Smart cities as strategic actors: insights from EU Lighthouse projects in Stavanger, Stockholm, and Nottingham. In: Karvonen, A., Cugurullo, F., Caprotti, F. (Eds.), *Inside Smart Cities: Place, Politics and Urban Innovation*. Routledge, London.
- Harrison, P., 2015. South-south relationships and the transfer of 'best practice': the case of Johannesburg South Africa. *International Development Planning Review* 37 (2), 205–223.
- Heese, K., Allan, K., 2018. Technology can herald bright future for cities. *Business Day*.
- Hemment, D., Townsend, A., 2014. *Smart Citizens*. FutureEverything, Manchester.
- Herbert, C.W., Murray, M.J., 2015. Building from scratch: new cities, privatized urbanism and the spatial restructuring of Johannesburg after apartheid. *Int. J. Urban Reg. Res.* 39 (3), 471–494.
- Hollands, R.G., 2008. Will the real smart city please stand up? Intelligent, progressive or entrepreneurial? *City* 12 (3), 303–320.
- James, A., 2016. Technology solutions help to boost citizen empowerment. *Business Day*.
- Joss, S., Sengers, F., Schraven, D., Caprotti, F., Dayot, Y., 2019. The smart city as global discourse: Storylines and critical junctures across 27 cities. *J. Urban Technology* 26 (1), 3–34.
- Karvonen, A., Cugurullo, F., Caprotti, F., 2019. *Inside Smart Cities: Place, Politics and Urban Innovation*. Routledge, London.
- Kasarda, J.D., 2013. Aerotropolis: Business mobility and urban competitiveness in the 21st century. *Urban Insight* 2 (7).
- Kasarda, J.D., 2015. Welcome to Aerotropolis, the City of the Future. *New Perspectives Quarterly* 32 (3), 43–45.
- Kitchin, R., 2014. The Real-Time City? Big Data and Smart Urbanism. *GeoJournal* 79, 1–14.
- Kitchin, R., 2015. Making sense of smart cities: addressing present shortcomings. *Cambridge J. Regions, Economy and Society* 8 (1), 131–136.
- Kong, L., 2014. Transnational mobilities and the making of creative cities. *Theory, Culture & Society* 31 (7–8), 273–289.
- Kuk, G., Janssen, M., 2011. The Business Models and Information Architectures of Smart Cities. *J. Urban Technology* 18 (2), 39–52.
- Latour, B., 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford University Press, Oxford.
- Le Guern, S., 2014. City ICT exchange still smart 10 years later, *Sunday Tribune*.
- Levenda, A.M., 2019. Mobilizing smart grid experiments: Policy mobilities and urban energy governance. *Environment and Planning C: Politics Space* 37 (4), 634–651.
- Luque-Ayala, A., Marvin, S., 2015. Developing a critical understanding of smart urbanism? *Urban Studies* 52 (12), 2105–2116.
- Malinga, S., 2016. Tshimologong Precinct project finally comes together, ITWeb.
- Madumo, O.S., 2015. Developmental local government challenges and progress in South Africa. *Administratio Publica* 23 (2).
- Marvin, S., Luque-Ayala, A., McFarlane, C., 2015. *Smart Urbanism: Utopian Vision Or False Dawn?* Routledge.
- McCann, E., 2011a. Points of reference: Knowledge of elsewhere in the politics of urban drug policy. In: McCann, E., Ward, K. (Eds.), *Mobile Urbanism: Cities and Policymaking in the Global Age*. University of Minnesota Press, Minneapolis, pp. 97–122.
- McCann, E., 2011b. Urban policy mobilities and global circuits of knowledge: toward a research agenda. *Ann. Assoc. Am. Geogr.* 101 (1), 107–130.
- McCann, E., Ward, K., 2010. Relationality/territoriality: Toward a conceptualization of cities in the world. *Geoforum* 41 (2), 175–184.
- McCann, E., Ward, K., 2011a. *Mobile Urbanism: cities and policymaking in the global age*. University of Minnesota Press, Minneapolis.
- McCann, E., Ward, K., 2011b. Urban assemblages: territories, relations, practices, power. In: McCann, E., Ward, K. (Eds.), *Mobile Urbanism: cities and policymaking in the global age*. University of Minnesota Press, Minneapolis, pp. xiii–xxv.
- McCann, E.J., 2008. Expertise, truth, and urban policy mobilities: global circuits of knowledge in the development of Vancouver, Canada's four pillar' drug strategy. *Environment Planning A* 40 (4), 885–904.
- McFarlane, C., Söderström, O., 2017. On alternative smart cities: from a technology-intensive to a knowledge-intensive smart urbanism. *City* 21, 312–328.
- Microsoft, 2015. *City and Microsoft collaborate in smart move*, The Star.
- Mochiko, T., 2010. Smart cities shaped by hi-tech solutions. *Business Day*.
- Montero, S., 2017. Study tours and inter-city policy learning: Mobilizing Bogotá's transportation policies in Guadalajara. *Environment and Planning A: Economy and Space* 49 (2), 332–350.
- Montero, S., 2020. Leveraging Bogotá: Sustainable development, global philanthropy and the rise of urban solutionism. *Urban studies* 57 (11), 2263–2281.
- Moolla, Y., 2008. Taking some time to become a 'smart city'. *The Mercury*.
- Moyo, A., 2012. Conflicting interests hinder SA's smart city growth, ITWeb Online.
- Mzekandaba, S., 2016. SA's IOT market set to explode, ITWeb Online.
- Naidoo, S., 2008b. Durban to be SA's first smart city, Independent Online.
- Naidoo, S., 2007. Faster, cheaper net access on the cards for eThekweni, The Mercury.
- Naidoo, S., 2008a. Durban's broadband offer piques widespread interest, The Mercury.
- Naidoo, S., 2008b. Durban to be SA's first smart city, Independent Online.
- Odendaal, N., 2003. Information and Communication Technologies (ICT's) and local governance: Understanding the differences between cities in developed and emerging economies. *Comput. Environ. Urban Syst.* 27 (27), 585–607.
- Odendaal, N., 2016a. Smart City: Neoliberal Discourse or Urban Development Tool?, *The Palgrave Handbook of International Development*. Springer 615–633.
- Odendaal, N., 2016b. Getting Smart about Smart Cities in Cape Town: Beyond the Rhetoric. In: Marvin, S., Luque-Ayala, A., McFarlane, C. (Eds.), *Smart Urbanism: Utopian Vision or False Dawn?* Routledge, London.
- Odendaal, N., 2019. Appropriating "Big Data": Exploring the Emancipatory Potential of the Data Strategies of Civil Society Organizations in Cape Town, South Africa. Emerald Publishing Limited, The Right to the Smart City.
- Ong, A., 2011. Introduction: Worlding Cities, or the Art of being Global. In: Roy, A., Ong, A. (Eds.), *Worlding Cities. Asian experiments and the art of being global*. Wiley-Blackwell, Oxford, pp. 1–26.
- Paskaleva, K.A., 2011. The smart city: A nexus for open innovation? *Intelligent Buildings International* 3 (3), 153–171.
- Peck, J., 2011. Geographies of policy: From transfer-diffusion to mobility-mutation. *Prog. Hum. Geogr.* 35 (6), 773–797.
- Peck, J., Theodore, N., 2015. *Fast policy: Experimental Statecraft at the Thresholds of Neoliberalism*. University of Minnesota Press, Minneapolis.
- Picon, A., 2015. *Smart cities: a spatialised intelligence*. John Wiley & Sons, Chichester.
- Prowse, J., 2016. *Smart Cape Town: using technology to deliver value*. Bizcommunity.com.
- Rat-Fischer, C., Rapp, F., Meidl, P., Lewald, N., 2012. *Smart City: Energy Efficiency in a New Scope, Resilient Cities 2*. Springer 119–124.
- Republic of South Africa (RSA), 1996. *Constitution of the Republic of South Africa*. Government Printers, Pretoria.
- Republic of South Africa (RSA), 1998. *White Paper on Local Government*. Government Printers, Pretoria.
- Republic of South Africa (RSA), 2000. *Municipal Systems Act*. Government Printers, Pretoria.
- Republic of South Africa (RSA), 2013. *National Development Plan*. Government Printers, South Africa.
- Republic of South Africa (RSA), 2016. *Integrated Urban Development Framework*. Government Printers, Pretoria.
- Republic of South Africa (RSA), 2019. *State of the Nation Address 2019*. www.gov.za (Accessed 20 September 2020).
- Robinson, J., 2013. 'Arriving at' urban policies/the urban: traces of elsewhere in making city futures. In: Söderström, O., Randeria, S., Ruedin, D., D'Amato, G., Panese, F. (Eds.), *Critical Mobilities*. Routledge, London, pp. 1–28.
- Robinson, J., 2015. 'Arriving at' urban policies: the topological spaces of urban policy mobility. *Int. J. Urban Reg. Res.* 39 (4), 831–834.
- Rogerson, C.M., 2018. Urban tourism, aerotropolis and local economic development planning: Ekurhuleni and OR Tambo International Airport. *South Africa. Miscellanea Geographica* 22 (3), 123–129.
- SAP, 2013. *Holistic Approach of SAP Urban Matters Program Delivers Sustainability Results for Cape Town*. 3BL Media.
- Scott, I., 2005a. *Broadband strategies 'critical'*, ITWeb Online.
- Scott, I., 2005b. *Digital city partnerships 'key'*, ITWeb Online.
- Scott, I., 2018. Transformation hit by policy problems. *The Sunday Independent*.
- Senne, D., Czernowalow, M., 2007. *Joburg advances towards 'digital city'*. ITWeb Online.
- Serumula, S., 2015. *Fibre-optic deal opens new chapter for Joburg*. The Star.
- Shelton, T., Zook, M., Wiig, A., 2015. The 'actually existing smart city'. *Cambridge J. Regions, Economy Society* 8 (1), 13–25.
- Sheppard, E., Leitner, H., Maringanti, A., 2013. Provincializing global urbanism: a manifesto. *Urban Geography* 34 (7), 893–900.
- Söderström, O., Geertman, S., 2013a. *Loose Threads: the Making of Public Space Policy in Hanoi*. Singap. J. Trop. Geogr. 34, 244–260.
- Söderström, O., Geertman, S., 2013b. *Loose Threads: the translocal making of public space policy in Hanoi*. Singap. J. Trop. Geogr. 34, 244–260.
- Söderström, O., Klausner, F., Paasche, T., 2014. *Smart Cities Corporate Storytelling City* 18 (3), 307–320.
- Staff reporter ITWeb Informatica, 2009. *Local Government*. ITWeb Informatica.
- Staff reporter Mail & Guardian, 2011. *Aerotropolis to boost economy*. Mail & Guardian.
- Staff reporter Sunday World, 2014. *Future lies in smart cities*. Sunday World.
- Staff reporter Targeted News Service, 2013. *Johannesburg to Host the 2014 C40 Mayors Summit*. Targeted News Service.
- Streitz, N.A., 2011. *Smart cities, ambient intelligence and universal access*. *Universal Access in Human-Computer Interaction. Context Diversity*. Springer, Berlin, pp. 425–432.
- Sutherland, E., 2020. *The fourth industrial revolution – the case of South Africa*. *Politikon* 47 (2), 233–252. <https://doi.org/10.1080/02589346.2019.1696003>.
- Tau, P., 2018. *Towards inclusive urbanism*. The Daily Maverick.

- Temenos, C., McCann, E., 2012. The local politics of policy mobility: learning, persuasion, and the production of a municipal sustainability fix. *Environment and Planning A* 44 (6), 1389–1406.
- Townsend, A.M., 2013. *Smart cities: Big data, civic hackers, and the quest for a new utopia*. WW Norton & Company, New York.
- Tubbs, B., 2015. SA's long road to smart cities, ITWeb.
- UCLGAfrica, 2016. Parks Tau, Mayor of Johannesburg: "Africa is ready to assume leadership of UCLG". UCLG Africa.
- United Nations Population Fund East and Southern Africa (UNFPA ESARO), 2019. United Nations Population Fund East and Southern Africa (Accessed 10 March 2021). FPA ESARO web site.
- Vanolo, A., 2014. Smartmentality: The Smart City as Disciplinary Strategy. *Urban Studies* 51 (5), 883–898.
- Viveiros de Castro, E., 2004. Perspectival anthropology and the method of controlled equivocation. *Tipiti: Journal of the Society for the Anthropology of Lowland South America* 2 (1), 3–22.
- Wathne, M.W., Haarstad, H., 2020. The smart city as mobile policy: Insights on contemporary urbanism. *Geoforum* 108, 130–138.
- Watson, V., 2014. African urban fantasies: dreams or nightmares? *Environment Urbanization* 6 (1), 215–231.
- Wiig, A., 2015a. The empty rhetoric of the smart city: from digital inclusion to economic promotion in Philadelphia. *Urban Geography* early view 1–19.
- Wiig, A., 2015b. IBM's smart city as techno-utopian policy mobility. *City: analysis of urban trends, culture, theory, policy action* 19 (2–3).
- Willis, K.S., Aurigi, A., 2017. *Digital and smart cities*. Routledge, London.