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# The 'actually existing smart city'

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**This paper grounds the critique of the 'smart city' in its historical and geographical context. Adapting Brenner and Theodore's notion of 'actually existing neoliberalism', we suggest a greater attention be paid to the 'actually existing smart city', rather than the exceptional or paradigmatic smart cities of Songdo, Masdar and Living PlanIT Valley. Through a closer analysis of cases in Louisville and Philadelphia, we demonstrate the utility of understanding the material effects of these policies in actual cities around the world, with a particular focus on how and from where these policies have arisen, and how they have unevenly impacted the places that have adopted them.**

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## Smart cities and urban governance in the 21st century

With the majority of the world's population residing in urban areas for the first time in human history, cities are emerging as key sites of social experimentation and problem solving in the 21st century (Glaeser, 2011; Grabar, 2013; Lehrer, 2010; Katz and Bradley, 2013). This demographic pressure, coupled with the twin crises of a rapidly warming global climate and lingering economic instability has led to a range of new conceptualisations of the city and concomitant policy prescriptions that place cities at the centre of solutions to these problems.

One of the more significant examples is that of the 'smart city', a somewhat nebulous idea which seeks to apply the massive amounts of digital data collected about society as a means to rationalise the planning and management of cities (cf. Townsend, 2013). According to IBM, one of the major corporate players promoting this particular vision of the future city, policymakers should approach cities as a "complex network of interconnected systems" (IBM, 2010), constantly creating new data that can be used to "monitor, measure and manage" urban life by "leveraging information to make better decisions…anticipating and resolving problems proactively… [and] coordinating resources to operate more efficiently" (IBM, 2012). This relatively simplistic imaginary of the smart city has been roundly critiqued on a number of fronts, especially around the entangling of neoliberal ideologies with technocratic governance and the dystopian potential for mass surveillance (Greenfield, 2013; Halpern et al., 2013; Hollands, 2008; Kitchin, 2014; Sennett, 2012; Vanolo, 2014). There is, however, a tendency within these critical accounts to see the smart city as a kind of universal, rational and depoliticised project that largely plays out according to the terms of profit-maximising, multinational technology companies. Ironically, this account has a good deal in common with the celebratory marketing literature produced by the likes of IBM, Cisco and Siemens, among others, which in effect reifies the vision of the smart city they wish to promote (Greenfield, 2013).

In contrast, we argue that the assemblage of actors, ideologies and technologies associated with smart city interventions bears little resemblance to the marketing rhetoric and planning documents of emblematic, greenfield smart cities, such as Masdar in the United Arab Emirates, Songdo in South Korea and Living PlanIT Valley in Portugal. Therefore, rather than focusing on new cities built from scratch in such peripheral locales, many of which have as-of-yet failed to materialise, we find it more productive to examine how the smart city paradigm is becoming grounded in particular places, especially in the more mature cities and economies of the global north. Rather than constructed on *tabula rasa* according to the centralised plans of multinational technology corporations, smart city interventions are always the outcomes of, and awkwardly integrated into, existing social and spatial constellations of urban governance and the built environment. Far from paradigmatic, greenfield smart cities are the exception rather than the rule, and provide little insight into the ways that an increasing attention to data is affecting the tangible outcomes of urban governance in existing cities.

This paper represents an attempt to ground the critique of smart cities in the historical and geographical context from which these ideas have arisen, connecting the ways these problems are conceived to the material effects of data-driven policy initiatives in actual cities around the world. Adapting Brenner and Theodore's (2002) notion of 'actually existing neoliberalism', we seek to understand the '*actually existing smart city*', rather than the idealised but unrealised vision that often dominates the social imaginary and critique of what a technologically-mediated city might look like in the 21st century. Rather than valorising or demonising the smart city, we demonstrate the complexity of this idea and the ways it is implemented in particular places, in order to counter the notion that the large technology companies are inherently 'bad' actors who have despoiled the 'good', righteous cities adopting these policies. We instead point towards a more nuanced, situated understanding of how and from where these policies have arisen, and how they are taking root in particular places around the world.

## Situating smart cities in time and space

Smart cities are not, by practically any stretch of the imagination, new. While proponents of the smart city, and its more academic cousin 'urban science' (cf. Lehrer, 2010), believe their interventions to be guided by the rational, rigorous and more 'scientific' methods of quantitative and computational data analysis, very little is novel about this approach. Indeed, planners and engineers have sought to make the study and management of cities more scientific for over a century (Fairfield, 1994; Ford, 1913; Schultz and McShane, 1978), not to mention the near-universal impulse of planners to propose grand solutions to social problems and economic growth (cf. Howard, 1965; or Hall, 2002 for an overview of planning history). That many expect smart city approaches to inevitably yield demonstrably superior results demonstrates, at best, their failure to understand the historical precursors to the smart city model.

Both geographers and planners have been using increasingly sophisticated quantitative and computational methods to understand cities since at least the 1950s. For geography, this took the form of the so-called ‘quantitative revolution’, in which the then-dominant idiographic, descriptive approach was overthrown in favour of a more scientific approach oriented towards uncovering the fundamental laws of geography (cf. Barnes, 2013; Barnes and Wilson, 2014). For urban planning, the post-war period brought new kinds of expertise from institutions like the RAND Corporation, which sought to apply their knowledge of defence planning to the problems of the American city. Computer models previously used to model the outcomes of nuclear warfare were understood as tools for more sophisticated, future-oriented ways of understanding urban economic processes, and thus allowing more targeted solutions to such problems (Light, 2003). LeGates et al. (2009) argue, however, that these attempts to make cities more scientific were often short-lived, as the expected successes were rarely, if ever, delivered. Thus, the fact that similar discourses are uncritically recycled by contemporary proponents of the smart city is troubling, albeit unsurprising given the cyclical history of urban planning (Hall, 2002).

Even if one were to accept the smart city as a more rational, scientific and depoliticised way of understanding and intervening in the city, it is important to note that the smart city as it has largely been envisioned and critiqued bares little resemblance to the reality of how urban planning and governance is changing in the era of big data (Batty, 2012; Boyd and Crawford, 2012; Kitchin, 2013). Rather than the construction of new cities from scratch or the wholesale importation of universal ideals into existing cities, the smart city is assembled piecemeal, integrated awkwardly into existing configurations of urban governance and the built environment. Rather than being paradigmatic, the examples of Masdar, Songdo and Living PlanIT Valley are the exceptions. As such, it is more productive to focus on the implementation of smart city policies in particular places, and how the differences between these places affect the outcomes of these interventions. So rather than studying unrepresentative exemplars and smart city imaginaries, the goal is to understand how smart city policies and ideologies play out in more ‘ordinary’ cities (Amin and Graham, 1997; Robinson, 2006). Ideas developed and tested in Songdo or Masdar will not translate perfectly to the particular socio-economic and spatial context of quintessential American cities like New York City, Chicago or Los Angeles, just as the data-driven policies being imagined in these cities will not translate perfectly to small or mid-size cities such as Louisville, or to places like Detroit, which face innumerable political and economic challenges. Furthermore, it is important to recognise that smart cities are also *internally* differentiated. That is, like any other phenomena, they are geographically uneven at a variety of scales. Whatever it means for a city to be ‘smart’, it is also readily apparent that not all spaces of the city will be *equally* smart, meaning that smart cities will privilege some places, people and activities over others.

Ultimately, a key element of the smart city is its ability to promote economic growth, a point IBM makes repeatedly in their marketing literature:

> …in the 21st century, cities compete globally to attract both citizens and businesses. A city’s attractiveness is directly related to its ability to offer the basic services that support growth opportunities, build economic value and create competitive differentiation. Potential inhabitants, of both the commercial and residential variety, are a discriminating lot, and they are looking for cities that operate efficiently and purposefully. They are looking for smarter cities. (IBM Smarter Cities, 2012)

While data is both the driving force behind smart city initiatives, as well as the means by which these initiatives are implemented, the ultimate goal of the policies is fostering economic development, with success judged accordingly. Thus, echoing earlier work on entrepreneurial urbanism by Molotch (1976), Cox and Mair (1988) and Harvey (1989), the smart city idea largely coalesces around strategies for economic growth in an era of austerity. While the mobilisation of data can make the operation of municipal governments more cost-efficient, allowing them to 'do more with less' (IBM Smarter Cities Director, 2012), the existence of these initiatives is largely seen as a means of territorial competitiveness, a way of attracting both capital and labour to cities. Just as it represents the latest resurgence of hyper-rational, technoscientific planning, so too does the smart city represent the latest in a long line of policy models that see science and technology as panaceas for economic malaise. From the growth of research parks attempting to mimic the success of Silicon Valley and North Carolina's Research Triangle Park (O'Mara, 2005), to Richard Florida's idea of the creative class (Peck, 2005), these policy models cast the role of municipal governments as competing, in whatever way possible, for the scant economic resources available to them.

## Understanding the 'actually existing smart city'

The proliferation of new forms of data—whether collected from sensors embedded in the built environment or gathered from social media platforms—has offered up new opportunities for understanding urban processes which, in according to the rhetoric of smart cities, will differentiate places and make them more competitive. In short, these new sources of data and new ways of analysing, visualising and understanding data have reconfigured the social and spatial processes of urban governance and economic development. Data now occupies a central place in urban governance, acting as a kind of master signifier or obligatory passage point through which *all* other functions must position themselves (Callon, 1986). Data is now both the modus operandi and raison d'etre of this latest form of urban governance. This new mode of data-driven urban governance is comprised of both relational and territorial elements, reflecting that contemporary urban governance is both connected to global flows of people, ideas and money (that is, relationality) as well as grounded in particular places in both their genesis and effect (that is, territoriality) (McCann, 2011; McCann and Ward, 2010). By reviewing both the relational and territorial dimensions of the actually existing smart city, we highlight the means by which this new urban policy model has diffused, while also understanding how these ideas have affected material changes in existing places.

## Reconfigured relationalities

One of the key changes associated with the rise of the smart city model is the emergence of new inter-organisational partnerships and alliances, built around the development and implementation of data-driven governance projects. Often these initiatives have little to do with the cities themselves, and instead reflect extra-territorial networks of key actors and institutions at the centre of much of the substantive efforts to realise smart city projects, often funding or executing specific plans in cities.

While some technical assistance programmes, like IBM's Smarter Cities Challenge, originate in the private sector and serve as a kind of marketing campaign for these corporations' products and services (IBM, 2012; Schwartz, 2010), others, such as the Code for America fellowship programme and its 'web geeks' and 'city experts' (Bilton, 2010; Kamenetz, 2010), ostensibly provide the perspective of civil society, albeit largely from individuals with roots in the technology industry. In addition, there are philanthropic organisations like the Knight Foundation and

Bloomberg Philanthropies, which provide large grants to municipal governments and technology start-ups alike in order to promote data-driven governance initiatives as small as the development of a new smartphone or web-based application, or as large as a restructuring of municipal government priorities and operations (Bloomberg Philanthropies, 2011; Bracken, 2013). Similar initiatives exist elsewhere, such as the quasi-governmental organisation, the European Innovation Partnership on Smart Cities and Communities, whose funding helps EU cities seeking to apply smart city technologies to issues of energy and transportation (EIP-SCC, 2014).

The flow of ideas and money through these organisational gatekeepers is not the only way that smart city ideas are propagated, as a number of cities have themselves become key actors in mobilising particular policy interventions and exporting them to other localities. Just as Detroit's many efforts to quantify and map vacant properties throughout the city have made it a kind of 'centre of calculation' for those interested in measuring and managing blight (Byrnes, 2014; Klinefelter, 2014), so too has Baltimore become an important site for city officials interested in learning about so-called 'Stat' programmes for government performance improvement (Behn, 2006; Perez and Rushing, 2007). Elsewhere, the City of Boston's New Urban Mechanics programme, which seeks to use digital tools for civic engagement (such as the much-heralded smartphone app StreetBump, which helps to detect and report potholes on city streets) has been directly replicated in Philadelphia, with potential expansion to other cities as well (GovTech, 2012; Judd, 2012). Likewise, the data-driven approach promoted by former New York City mayor Michael Bloomberg has been introduced to other cities through the aforementioned Bloomberg Philanthropies and its so-called 'Mayors Challenge' and 'Ideas Camp', in which cities compete for funding and fine tune selected projects. In 2013, over 300 US cities applied for this funding, while the 2014 contest resulted in submissions from over 150 European cities (Bloomberg Philanthropies, 2014).

Ultimately, these new relationships between municipal governments and extra-local organisations have resulted in the valuation of new kinds of technical expertise within government. Rather than the kinds of deep knowledge of regulations or of place-based specificities embodied in municipal bureaucrats, cities are increasingly coming to value skills more commonly found in technology start-ups, such as computer programming and data analytics. To cite but one example, the mayor of Lexington, Kentucky recently hired as a senior advisor a deputy analytics officer from the outgoing Bloomberg administration—further demonstrating the importance of the handful of cities that were at the forefront of these developments—whose previous experience was in online commerce (Chipman, 2014). This example attests to the fact that this new kind of expertise tends to be embodied in far off places and organisations which must be brought in from outside in order to help, in turn devaluing the local knowledge of citizens whose participation in the political system becomes relegated to collecting or volunteering the data which will be analysed by the experts.

## New territorial imaginaries

The reconfiguration of these socio-spatial relationships is not, however, just about going *beyond* the borders of the city, but also about how relationships within the city are changing, especially with respect to ways of imagining the different spaces of the city and the 'urban problems' posed by and within such spaces, and what kinds of interventions might be designed to ameliorate these problems. In order to better understand the geographically-differentiated spaces of the smart city, it is important that we ask how visions of the data-driven, smart city are actually playing out in specific cities and neighbourhoods. Using the cases of two US cities, Louisville and Philadelphia, we demonstrate how smart city projects help produce new ways of thinking about different urban spaces, as well as how these spaces are transformed as a result of such practices.

### *Conflicting data-driven understandings in Louisville's West End*

In Louisville, Kentucky, the conglomeration of predominantly poor and African–American neighbourhoods known as the West End has been pushed to the forefront of recent policy debates about how best to plan for and solve the problems facing the city. While these debates continue to be influenced by conventional media representations of crime and poverty in this area, data is becoming increasingly important in constructing representations of the West End. For instance, a Louisville Magazine cover story from March 2013 explored the so-called '9th Street Divide' by comparing basic demographic statistics such as median income, educational attainment, median home values and car ownerships between West End neighbourhoods and their predominantly wealthy and white counterparts in the East End (Crutcher, 2013).

While data-driven analyses tend to emphasise their objectivity, accuracy and neutrality, it is important to keep in mind that data are socially constructed, and different forms of data allow for competing representations of place. Because the production of data is always a situated process—that is, it is always influenced by the particular spatial and temporal context in which it is collected or produced, and carries the biases of its creators (Wilson, 2011)—data is open to political contestation, directly challenging the smart city's reliance upon data as a politically neutral tool for decision-making. This is readily evident in competing representations of Louisville's problem with vacant properties, an issue disproportionately affecting the West End (Metropolitan Housing Coalition, 2012). The Metro government, under the leadership of Mayor Greg Fischer has been "determined [to] use data to improve the lives of all Louisvillians" (Carroll, 2013; Fischer, 2012), including releasing numerous datasets on vacant and abandoned properties to the public. In practice, however, data are often displayed in a Google Maps mashup-style 'heat-map' display providing little insight beyond confirming the already well-known concentration in the West End (Figure 1).

In contrast to this dominant narrative is the alternative data-driven work of the Network Center for Community Change, a now-defunct West End neighbourhood organisation, and its community mapping project. Using data derived from an on-the-ground, pen-and-paper neighbourhood survey, this effort disputes the city's official statistics on vacant properties, showing the scope of the problem to be much larger and longer-standing than the city might care to admit. It also uses a much richer data typology, situating each vacant property within its immediate spatial context, as well as providing data on back taxes, third party liens and ownership (Ritter, 2012; Schiller, 2012). Given that smart city policies are predicated on assumptions that data allows for better decision-making, the competing representations of vacant properties creates a rift in the smooth façade of the smart city imaginary (Carter, 2013). While the city may prefer to make policies based on its own datasets, however flawed and limited they may be, the existence of countervailing data belie the expectations of more efficient and proactive problem solving associated with smart cities (Figure 2).

In short, the exercise of mapping vacancies in Louisville's West End highlights that data is never simply an objective representation of the world and always a possible forum for political contestation. Moreover, it is clear that the use of data, by both local political actors and the marginalised population of the West End, has focused new attention to long-standing problems facing these neighbourhoods. The policy outcomes brought by this mobilisation of data in urban governance, however, is fundamentally

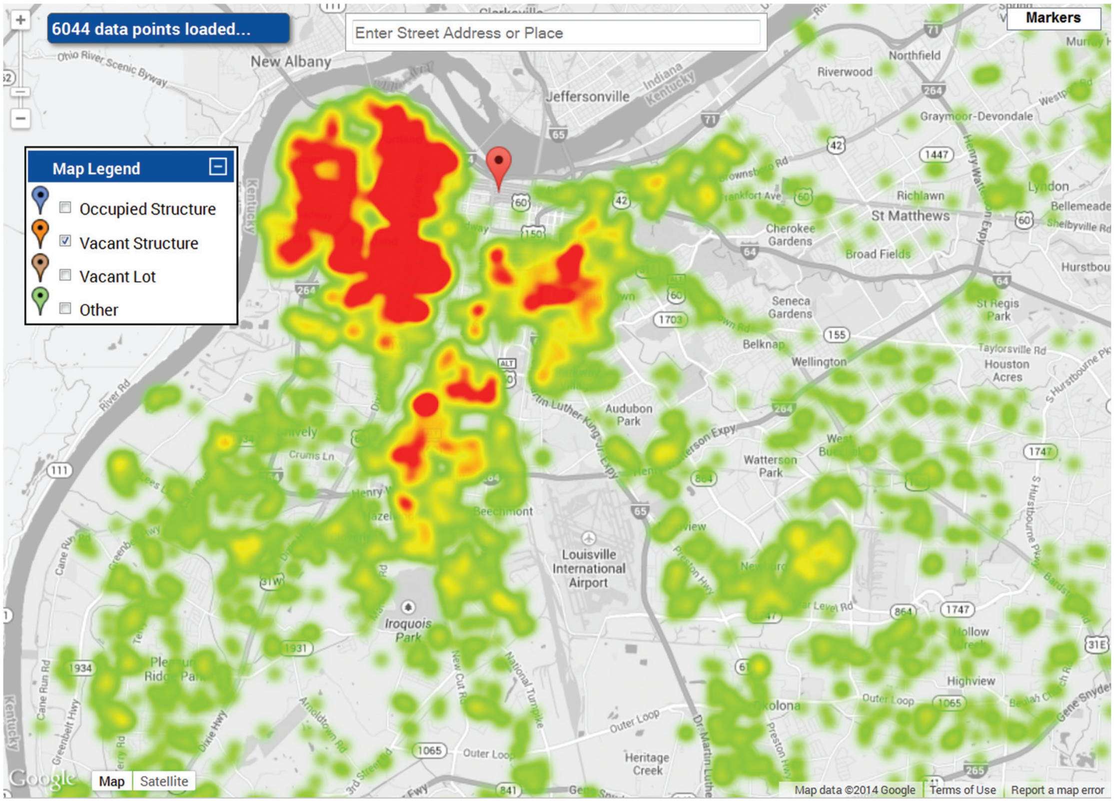


**Figure 1.** *Heatmap of vacant properties from Louisville Metro Government Website.*
*Source:* Author screenshot of http://www.louisvilleky.gov/ipl/PropertyMaintenance/map.htm.

shaped by the particular forms of data used—whether in the form of narrative descriptions, comparative graphics or digital maps—and the processes and actors behind its production.

### *Imagining a global Philadelphia through the smart city as a promotional vision*

In Philadelphia, a smart city initiative called 'Digital On-Ramps' emerged out of the city's participation in IBM's Smarter Cities Challenge in 2011 (IBM, 2011). This digital inclusion effort sought to provide a mobile, Internet-based application for workforce education that would train marginalised, low-literacy residents with the skills to be competitive for jobs in the 21st century information economy (Nutter, 2012a). The ubiquity of smartphones and pervasive access to the mobile Internet was seen by both IBM and city's policymakers as an entry point to providing new pathways to relevant skill sets for entry-level jobs that would ultimately bridge longstanding socio-economic divides in the city (Figure 3).

In practice, however, it is evident that these divides persist. While the residents targeted by the initiative primarily lived in marginalised, de-industrialised inner city neighbourhoods (Drexel University Program Manager and Drexel University Senior Web Architect, 2013), the emerging information economy has clustered in three other areas of the city: (i) the central business district surrounding City Hall, (ii) just west of downtown between the University of Pennsylvania and Drexel University and (iii)

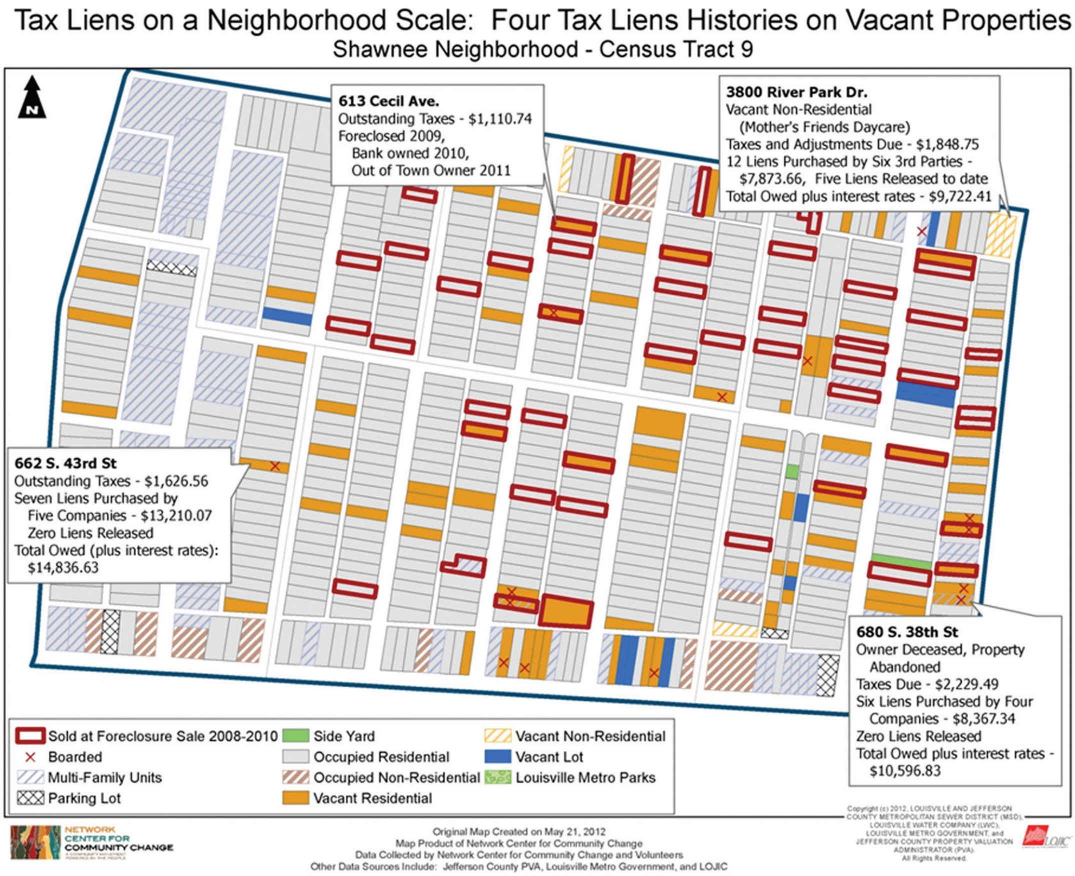


**Figure 2.** *Neighbourhood survey of vacant properties in Louisville's West End.*
*Source:* Network Center for Community Change. Available from: http://bencarterlaw.com/s/130712-NC3-Data-and-Research.pptx.

in the Philadelphia Navy Yard, an innovation zone at the city's southern periphery (Gyourko et al., 2005; Hodos, 2002; Simon and Alnutt, 2007). The latter is a new place for public and private investment to flow, far removed both socially and spatially from the poorer neighbourhoods that the city's smart city project was meant to help. The target industry of the Digital On-Ramps' initial pilot was advanced manufacturing (Drexel University Program Manager and Drexel University Senior Web Architect, 2013), which in Philadelphia includes a wide-ranging cluster of pharmaceutical, aerospace and petroleum refining industries (Select Greater Philadelphia, 2014), for the most part proximate to or within the Navy Yard (Ben Franklin Technology Partners, 2014). That an advanced manufacturing enterprise seen as central to the city's smart city effort was not located in closer proximity to the neighbourhoods and people supposedly targeted by the city's new policies only further highlights the incongruences between the smart city discourse and the actually existing smart city as it has materialised in Philadelphia (Drexel University Program Manager and Drexel University Senior Web Architect, 2013).

Even if education and workforce training provided the means for marginalised residents to obtain well-paying jobs in the information


**Figure 3.** *The entrance to the Philadelphia Navy Yard.*
*Source:* Photo by Alan Wiig (2012).

economy, they still face challenges of personal mobility in travelling between home and work. Precisely because the smart city initiative did not extend beyond education and digital literacy programming, the ‘digital on-ramps’ were themselves seen as a sufficient scope for a smart city initiative, while longstanding socio-spatial inequalities were left unaddressed. While all smart city projects certainly do not need to address all aspects of such inequality, the data-driven focus of Digital On-Ramps illustrates how the popular perception of smart city initiatives as an overarching, citywide urban policy concern often narrows its focus onto much smaller deliverables that may have minimal effect. Beyond the limitations of this narrow focus, ‘Digital On-Ramps’ online application has yet to move past the planning stage as of summer 2014, despite Philadelphia’s mayor touting the project’s success at the IBM’s Smarter Cities Summit nearly two years prior in late 2012 (Nutter, 2012b).

In Philadelphia, the smart city has acted primarily as a promotional vehicle, highlighting the city’s efforts to produce a competitive, entry-level workforce for the 21st century economy, despite achieving few meaningful results in this respect. But the fact that these new smart city initiatives, such as the Navy Yard development, are so socially and spatially fragmented highlights the need to move beyond the promotional rhetoric of smart city initiatives to examine exactly where and how the smart city impacts a city, recognising that rather than solving problems of inequality, the smart city is likely only to reproduce them in new ways.

## Conclusion

This paper has offered a strategy for grappling with the actually existing smart city and its more subtle impacts on urban governance and planning. While the as-of-yet unrealised marketing rhetoric of the big technology companies has provided fertile ground for critique, it is not enough to limit our attention to these discourses. Instead, we have argued for a focus on the relationalities through which the smart city, as it actually exists, has been produced, and on the territories in which this idea has taken root and effected change. We have shown the ways that data has historically been mobilised as a kind of depoliticising device, obscuring how data are conceived, collected and legitimised for use in urban politics and policymaking (Wilson, 2011).

We have also shown that in the actually existing smart city lies the potential for contesting these dominant neoliberal framings of data, as we demonstrated with the case of Louisville's vacant properties problem. Another similar example comes from the Tenison Road project in the UK, which also re-centres questions about how data comes to matter (Taylor et al., 2014). Although this project mobilises conventional smart city technologies, it is at the behest of local residents rather than outside actors, and is designed in such a way as to emphasise the community's understanding and use of this data. Seen in this light, the problem is less with data, per se, and more with the uncritical, ahistorical and aspatial understandings of data often promoted within smart city imaginaries, themselves recycled from earlier attempts to make urban studies and planning 'more scientific'. In contrast, Philadelphia's use of the smart city as a promotional device highlights the shallowness of much of the smart city discourse. Instead, by looking at the ways that this framing has failed to deliver material benefits to Philadelphia residents, we can come to understand the connections of the smart city model to the long-standing entrepreneurial turn in urban governance (Harvey, 1989; Hollands, 2008).

In closing, the framing we propose for future research does not over valorise the smart city as something wholly new and separate from that which has come before, or that which will likely come after. Rather, it is clear that the power of the smart city imaginary to capture the minds of corporations, policymakers and average citizens makes it an important means through which cities are being (re)constructed in the 21st century. While we remain critical of the smart city model, both as it is offered up by large technology corporations and as it has actually been implemented in cities like Louisville and Philadelphia, we also highlight the alternative possibilities opened up by these new forms of data-driven governance. However, it is only through a grounding of our analysis in the actually existing cities, territories and relationalities where these policies are being constructed and implemented that we can understand both the promise and the peril of the smart city model.

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