

# #BlockSidewalk to Barcelona: Technological sovereignty and the social license to operate smart cities

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## Abstract

This article explores *technological sovereignty* as a way to respond to *anxieties of control* in digital urban contexts, and argues that this may promise a more meaningful social license to operate smart cities. First, we present an overview of smart city developments with a critical focus on corporatization and platform urbanism. We critique Alphabet's Sidewalk Labs development in Toronto, which faces public backlash from the #BlockSidewalk campaign in response to concerns over not just privacy, but also lack of community consultation, the prospect of the city losing its civic ability to self-govern, and its repossession of public land and infrastructure. Second, we explore what a more responsible smart city could look like, underpinned by technological sovereignty, which is a way to use technologies to promote individual and collective autonomy and empowerment via ownership, control, and self-governance of data and technologies. To this end, we juxtapose the Sidewalk Labs development in Toronto with the Barcelona Digital City plan. We illustrate the merits (and limits) of technological sovereignty moving toward a fairer and more equitable digital society.

## 1 | INTRODUCTION

The smart city finds its preconditions in late-19th century visions of the future city as “a lavish utopia of a forthcoming mechanized age, inspired by the latest developments in science and industry” (Angelidou, 2015, p. 96). With the advent, development, and spread of Information Communication Technologies (ICTs) from the 1960s onward, the technology and data-driven city started to become a reality. Early smart city prototypes include Masdar City in the United Arab Emirates, and Songdo International Business District in South Korea (Halegoua, 2011), both established in the mid-2000s. As exemplars of the smart city, purpose-built cities like Masdar and Songdo are the exception rather than the rule, for as Shelton, Zook, and Wiig (2015) explain, in most cases “the smart city is assembled piecemeal, integrated awkwardly into existing configurations of urban governance and the built environment” (p. 15). What these prototype cities demonstrate, however, is the

embeddedness of technological and data capitalism (Kitchin, 2014, p. 10). As of 2019, there are over 240 self-proclaimed smart cities in Europe (European Parliament, 2017), and this trend extends internationally. From Alphabet's Sidewalk Labs waterfront development in Toronto, Canada (Goodman & Powles, 2019) to Tesla-powered YarraBend in Victoria (Mosco, 2019) and Springfield in Queensland, Australia (Springfield City Group, n.d.), Medellín in Colombia (Useche, Silva, & Vilafañe, 2013), Crown Prince Mohammed bin Salman's NEOM in Saudi Arabia (NEOM, n.d.), GIFT City in India (Tiwari & Jain, 2014), Eko Atlantic in Nigeria (Slavova & Okwechime, 2016), and Toyota's recently announced “Woven City” in Japan (woven-city. global), the drive toward smart cities is evident across the globe, thrust onto existing cities as well as purpose-built ones.

Conceived as an engine for economic growth and technological diversification (Gibson, Kozmetsky, & Smilor, 1992; Smilor, Gibson, & Kozmetsky, 1989), the smart city

is predicated on the proliferation of technology and data analytics for urban management and governance, necessitating collaboration between the city and private “big tech” sector. In this regard, the smart city “unite[s] cities’ need for help with technology firms’ need for markets” (Goodman & Powles, 2019, p. 2), but this symbiosis between big tech and urban governance in the smart city is not without friction. The smart city has itself become a corporate brand (Hollands, 2015b; Vanolo, 2017; Yigitcanlar & Lee, 2014) that both relies on and drives the notion that its promise of efficiency, prosperity, sustainability, and equitability can, as Hollands (2015b) puts it, “only be effectively delivered through a corporate vision of smartness, in conjunction with an entrepreneurial form of urban governance” (p. 62). And yet, as critics of the smart or corporatized city have argued, this ongoing corporatization of urban governance has done little to ameliorate deeply rooted social problems, but has rather—against the dominant rhetoric of the smart city—tended to entrench and further deepen existing urban inequality (Harvey, 2012; Hollands, 2015b; Wiig, 2016).

Corporate smart cities, critical researchers have argued, merely propose technological fixes (Brenner & Schmid, 2015) by enhancing social regulation, control, governance, surveillance, privacy erosion, predictive profiling, social sorting, and behavioral nudging (Elwood & Leszczynski, 2011; Graham, 2005; Kitchin & Dodge, 2011; Sadowski, 2020; Vanolo, 2014) to enhance the proliferation of capital. These practices stand in stark contrast to the apolitical, non-ideological, commonsensical, objective, and rational image that smart cities seek to portray, which promises prosperity, sustainability, and liveability on the basis of a presumed technological neutrality (Hollands, 2015a; Kitchin, 2017; Kitchin, Lauriault, & McArdle, 2015; Sadowski, 2016; Yigitcanlar, Foth, et al., 2019; Yigitcanlar, Kamruzzaman, et al., 2019).

In what follows, we focus on emerging privacy concerns within corporate, data-driven smart cities, as they manifest as *anxieties of control* (Leszczynski, 2015). We then examine the community-led backlash against the Sidewalk Labs development in Toronto, and the debate regarding its “social license to operate” platformed urbanism. We juxtapose the Sidewalk Labs development with the City of Barcelona to explore what a responsible smart city could look like; one that is informed by *technological sovereignty*.

## 2 | DATA-DRIVEN URBANISM, PRIVACY, AND ANXIETIES OF CONTROL IN THE SMART CITY

Furthered by neoliberal rhetoric promoting the smart city’s optimization, efficiency, and productivity (Kitchin, 2015;

Vanolo, 2014), the smart city relies on seeing its citizens as data-rich resources for its data-heavy operations. For Söderström, Paasche, and Klauser (2014), smart city rhetoric represents a utopianism “governed by code rather than spatial form” (p. 315). In the utopian smart city, data otherwise “trapped, ‘unsmartly’ organized in information silos” can be “unleashed” through algorithmic processing, connected with other data, and put to use (Söderström et al., 2014, p. 315). The challenges of linking, integrating, analyzing, interpreting, and making sense of these disparate and untapped data enable new ways of visualizing, modeling and predicting more efficient and sustainable cities, through optimization of energy and water supplies, traffic flow, public transport, and improved healthcare (Hancke, Silva, & Hancke Jr, 2013) or the reduction of crime (Pali & Schuilenburg, 2019).

As technology-based and data-driven decision-making is promoted, adopted, and embedded through smart city technology, we see a shift to digital and data-based forms of governance (Miller, 2018). The privatization of city services that inevitably accompanies this shift has also seen the privatization of data generated and collected through these services, leading to gaps in the data available to local governments or substantial costs for its purchase (Kitchin, 2017, p. 51). The value of data and its commodification act as further motivators for smart city corporate providers to create false scarcity by restricting access and increasing proprietary, noninteroperable interfaces and data standards, enabling corporations to assert control of the market for public service provision via intellectual property protections (see e.g., Goodman & Powles, 2019). Similarly, intensified data collection in urban governance raises significant privacy, human rights and social justice concerns, especially when it remains undifferentiated: the source of the data might be a smart waste bin or a person, but the focus, within the utopian smart city paradigm, is less on where that data came from, and any ensuing implications, but on how these data can be harvested and aggregated to provide more optimal and efficient urban governance. While generating and collecting urban data within cities is not new (Fitzgerald, 2016; see e.g., Miller, 2018), the smart city shifts urban governance from being *informed* by data, to *data-driven* urbanism (Kitchin, 2017). The commodification of urban data has, in turn, fueled the platformization of the urban, which, as Barns (2020) puts it, restructures “urban relationships as a ‘platform ecosystem’” (p. 100).

These processes of mass data collection, consolidation, and use need to be examined against the backdrop of potential urban dystopias, and possible “utopias,” too (see also Daly, Devitt, & Mann, 2019). In a panoptic smart city (Foth et al., 2014; Galdon-Clavell, 2013; Kitchin, 2014) mass-surveillance is facilitated to preserve the existing

social order through systemic injustices, biases, inequalities, and power structures (Anttiroiko, 2013; Hollands, 2015b; Pali & Schuilenburg, 2019; Watson, 2013). Platform ecosystems, platform urbanism and the “platform society” represent “a connective world where platforms have penetrated the heart of societies—affecting institutions, economic transactions, and social and democratic structures” (van Dijck, Poell, & de Waal, 2018, p. 2). These disruptions are designed to consolidate existing hegemonic power structures and serve the interests of corporations, governments or what Tombs and Whyte (2015) term the “state-corporate nexus.” Alphabet Inc., Google’s parent conglomerate, is a panoptic platform that sees from *many* vantage points.

Surveillance dystopias are manifest. Rio de Janeiro used its smart city command and control centers to repress public protest against the 2014 FIFA World Cup, which displaced socio-economically marginalized people (Gaffney & Robertson, 2018; Rekow, 2015). The United States employs predictive policing using biased data that reflects the disproportionate incarceration rates of African Americans (Hao, 2019). China’s social credit system reinforces government ideology of what it means to be a “trustworthy” citizen (Hatton, 2015), and employs artificial intelligence and facial recognition technology to racially profile and segregate Muslim minorities (Mozur, 2019). Chinese surveillance software, offered together with training on “public opinion guidance” is conquering new markets including Ecuador, Zimbabwe, Uzbekistan, Pakistan, Kenya, the United Arab Emirates, and Germany (Mozur, Kessel, & Chan, 2019).

Between the utopian and dystopian visions, new arrangements and reconceptualizations of privacy are developing in line with emerging *anxieties of control* (Leszczynski, 2015). The question of privacy has always been a contested and multifaceted one in the context of the city and its citizens.<sup>1</sup> In the Western liberal tradition, Nuyen (2002) explains, “citizenship is seen as the public dimension of a person, who also has his or her private dimension,” with liberal philosophers like John Stuart Mill considering “citizenship as the means to ensure a proper relationship between the private individual and the public community, namely, a relationship that guarantees individual autonomy and protects it from state intrusions” (p. 128). The concept of the “private citizen” emerged to reflect this relationship between the private and public facets of citizenship. Yet, the citizen can never be truly “private.” Citizenship requires ceding some privacy to participate in the political and social life of the city and access its amenities. Nuyen (2002, p. 133) follows Keith Faulks (2000) in concluding that the “concept of the ‘private citizen’ is an oxymoron.” Faulks (2000) explains that citizenship, with its combined “individualistic and

collectivist elements,” appeals in equal measure to both sides of the political spectrum—to left and right, to radical and conservative—and that, despite the well-entrenched idea of the “private” citizen, no citizen is immune from the “duties and obligations” that go hand-in-hand with citizenship (p. 1). Those duties and obligations, as Mattern (2018, April) has astutely pointed out, have often taken the form of “[o]ffering oneself up as data, or as a data-collector” through, for example, participation in national censuses or government surveys (para. 30).

The drive toward mass surveying, data collection, and aggregation in the 20th century began the work of reducing citizens to data—what Mattern (2018, April) calls an “ontological reduction (that) inevitably leads to impoverished notions of city planning, citizenship, and civic action” (para. 34). In the “code space” of the smart city, however, this drive to quantify has been taken to new and concerning levels. In this space, where our bodies are reduced to an agglomeration of public and proprietary data and “civic action is reduced to data provision,” the citizen, the city, and the public sphere are at risk (Mattern, 2018, April, paras. 35, 36). In the “computationally-engineered city,” Mattern (2018, April) writes:

The citizen can perform her public duties from the privacy of a car or bedroom. If her convictions and preferences can be gleaned through an automated survey of her browser history, network analysis of her social media contacts, and sentiment analysis of her texts and emails, she needn’t even go to the trouble of answering a survey or filling out a ballot. Yet she has no idea how an artificially intelligent agent discerns “what” kind of subject she is, how it calculates her risk of heart attack or recidivism, or how those scores impact her insurance premiums and children’s school assignments. Likewise, the researchers who deploy that agent, like those now working with Palantir and Northpointe, have no need to look at the raw data, let alone develop hypotheses that might inform their methods of collection and analysis. In this emerging paradigm, neither subjects nor researchers are motivated, nor equipped, to challenge the algorithmic agenda. Decision-making is the generation of patterns, a “pulse,” a “score” that will translate into policy or planning initiatives and social service provision. This is a vision of the city—society—as algorithmic assemblage. (para. 35)

The privacy concerns engendered by the algorithmic assemblages of the smart city have been the subject of

increased debate and research (John, Weiss, & Kelley, 2018; e.g., see Kitchin, 2016, 2018; van Zoonen, 2016) that identify how concepts of privacy are broadening and changing, while introducing new concerns about information security and monetization. The expansion of Google, Uber or Airbnb into the urban through their digital platforms—what has been termed “platform urbanism” or “platform capitalism”—has unlocked vast new avenues for urban data mining, processing, monetization, and redistribution (Barns, 2020; van Doorn, 2018; van Doorn, 2019). As Mattern (2020, February, para. 4) explains, handing the key to the city to Alphabet would also pass it to its plethora of subsidiaries (Android, YouTube, AdSense, Waymo, Nest, Calico, and others), many themselves data-extracting, monetizing, and proliferating digital platforms.

It is in this context of unprecedented data extraction in cities that the concept of “surveillant anxiety” (Crawford, 2014)—or a generalized societal fear that mass amounts of personal data are being collected and analyzed—has emerged. Leszczynski (2015) empirically assessed Crawford's (2014) concept of “surveillant anxiety” in the context of personal spatial data, finding that individuals are more concerned with the “*transparency* in data collection and in *controlling flows* of personal information” more than its eventual uses (Leszczynski, 2015, p. 965 emphasis added). Leszczynski (2015) concludes that citizen anxieties over dataveillance might be better understood as a *control* anxiety rather than a more general *surveillant* anxiety. These *anxieties of control* comprise an interrelated set of impulses and anxieties, including “the impulse of wanting to *discern* (be informed of, voiced in terms of concerns with transparency) and *direct* (maintain the contextual integrity of) flows of personal locational information about oneself within and across networks, yet feeling that any attempt to do so is essentially futile” (Leszczynski, 2015, p. 977).

While these *anxieties of control* are of greatest concern to citizens, they are also rapidly becoming critical to the technocratic dream of the global roll-out of smart cities. Kitchin (2014) has warned that “without regulated oversight and enforcement concerning abuses of data, then there is likely to [be] significant resistance and push-back against real-time analytics by citizens” (p. 12). A particularly visceral example of this can be seen in the ongoing 2019 Hong Kong protests, where news outlets reported protesters toppling smart lamp posts over fears they host the capability for facial recognition, enabling identification by Chinese officials (ABC News, 2019; Figure 1).

These smart lamp posts were hailed as a key part of Hong Kong's “Smart City Blueprint” (Innovation and Technology Bureau, 2017), and 50 of the proposed 400 lamp posts have been installed since June 2019 (Sharon, 2019). Their toppling after only a few months provides a salient and emphatic example of direct citizen resistance to smart city technologies, fueled by an acute *anxiety of control* combining concerns over surveillant smart city technologies with extraterritorial anxiety and the incursion into Hong Kong's (contested) sovereignty by China.

Although this may be an extreme example, occurring in a particularly intensive period of social and political unrest in Hong Kong, we are also witnessing, more broadly, the growth of community-led campaigns to push back against the corporate smart city (Cardullo, Di Felicianantonio, & Kitchin, 2019; Foth, Brynskov, & Ojala, 2015). In the following section, we focus on the #BlockSidewalk campaign, initiated by a group of Toronto citizens to resist the urban development agreement between Waterfront Toronto and Alphabet's Sidewalk Labs. We examine the #BlockSidewalk campaign as one prominent example of citizen resistance to the corporate smart city, as well as examining how both the development, and the campaign against it, mobilize us to (re)consider the “social license to operate.”



**FIGURE 1** Protesters in Hong Kong destroying smart lamp posts. Source: Thomas Peter/REUTERS (Ioanes, 2019) [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]



### 3 | RESISTING THE CORPORATE SMART CITY: THE #BLOCKSIDEWALK CAMPAIGN

Smart cities are increasingly being subject to citizen and community backlash fueled by an *anxiety of control*. Sidewalk Toronto, the Waterfront Toronto development by Sidewalk Labs, is the most recent, ongoing, and most prominent internationally. Sidewalk Labs (2019) is a solely owned subsidiary of Alphabet Inc., which became the parent company of Google and several former subsidiaries in 2015. Sidewalk Toronto has experienced extensive backlash, including a campaign to #BlockSidewalk, over concerns about large-scale corporate data collection without community consultation and democratic accountability. While the Waterfront Toronto's development history dates back much earlier (Desfor & Laidley, 2011), Sidewalk Labs proposed to develop a 12 acre site in 2017, then quickly expanded into an 880 acre waterfront smart city stretch (Goodman & Powles, 2019), raising questions about community involvement, ownership of data, and the risk of losing the city's civic ability to self-regulate (Wylie, 2018c). There are also significant power asymmetries between citizens and Sidewalk Labs's powerful parent conglomerate, echoed by the #BlockSidewalk campaign. Lending her support on the campaign's website, Shoshana Zuboff, author of *Surveillance Capitalism* (Zuboff, 2019), describes the #BlockSidewalk campaign as operating at the "frontline of an historic contest between surveillance capitalism and democracy" (Zuboff, n.d., para. 2). What Sidewalk Toronto promises, Zuboff (n.d.) continues, is a dystopian future that

turns the city into data flows owned and operated by private surveillance capital. [...] The city is reborn as a market project aimed at generating revenues for surveillance capitalists and their business customers. A thriving city includes business, but it is not itself a business. BlockSidewalk understands that a surveillance capitalist city is incompatible with democratic citizen rule. (Zuboff, n.d., para. 2)

Goodman and Powles (2019) critically examine this prototype smart city that is "designed to be replicated" and scaled (p. 3). They identify the rushed and secretive elements of the project as attempts to avoid public scrutiny, and conclude by stating they have no confidence that the development upholds democratic processes or that it is being implemented in the public interest. Three main concerns surrounding the Sidewalk Labs smart city development involve: (a) privatization, (b) platformization, and (c) domination. These intersecting issues are less about

privacy per se, and more concerned with transparency, democratic governance, the role of private corporations in urban development, the risk of reduced sovereignty at national and municipal levels, and the broader "delegation of public governance to a private platform" (Goodman & Powles, 2019, p. 25).

Significantly, Goodman and Powles (2019) argue there are conflicting values for smart city developments by platforms, where "in one version, the city intermediates between the public's data and service providers, prioritizing public benefit" *vis-a-vis* alternatives where "commercial platforms like Facebook and Uber intermediate, prioritizing profit or market share" (p. 30). This is pertinent in the context of the development agreements that indicate Waterfront Toronto will provide access to city datasets to commercialize products and services that ultimately benefit Alphabet Inc. (Goodman & Powles, 2019). Outlining the public relations campaign orchestrated by Sidewalk Labs, Goodman and Powles (2019) claim this involved "citizen engagement events with flavor, but not the actual accountability, of public hearings," and an "elaborate, performative, and painfully drip-fed process" (pp. 11, 43). It is therefore perhaps unsurprising the #BlockSidewalk campaign has centered on serving the public interest, with its public rhetoric promoting citizen involvement in the design process via fair, inclusive and transparent means.

Leszczynski's (2020) theorizing of platform urbanism "from the minor" identifies "glitches" in the Sidewalk Toronto project, including Sidewalk Labs not foreseeing Canadians' fierce demand for retaining data within the country (i.e., national data sovereignty). We interpret this as symptomatic of the anxieties of control about the flow of data from Canada, and as one of a number of possible catalysts for collective organization and resistance beyond the municipal and at a national level. Similar concerns have recently been discussed in the European context by Merkel and Macron (Laurent, 2019), and are the focus of the "Declaration on joining forces to boost sustainable digital transformation in cities and communities in the EU" sponsored by the European Commission, EuroCities, and the Open & Agile Smart Cities (OASC) network ([living-in.eu/declaration](http://living-in.eu/declaration)).

### 4 | A LEGITIMATE SOCIAL LICENSE TO OPERATE?

A notable emergence in the discourse around Sidewalk Toronto is the divergent views over whether the development has, or can achieve, a "social licence to operate" (SLO)—a symbolic seal of approval and acceptance by the local community. Soon after the announcement that

Sidewalk Labs had won the Waterfront Toronto bid to develop the smart precinct, Barns (2017) suggested that Sidewalk Labs's integration of "urbanists and technologists into its product planning," its inclusion of "residents and workers in beta testing," and its partnership with "a city government" allowed it to claim a form of "social licence to operate" (para. 22). Sidewalk Toronto is described as a partnership between Sidewalk Labs and Waterfront Toronto, with Waterfront Toronto itself representing a partnership between federal, provincial, and municipal governments in Canada. However, Waterfront Toronto is not a democratically accountable government entity, but a corporation (established in 2001) with an appointed board, governed by the federal, provincial, and municipal governments as equal, nonequity partners (Flynn & Valverde, 2019). Despite this, according to Flynn and Valverde (2019), Waterfront Toronto had achieved significant public support and positive reputation due to its history of taking an "open, consultative approach with civic organizations"—a reputation that began to be tarnished through its partnership with Sidewalk Labs and its ceding of responsibility for public engagement to Sidewalk Labs (p. 771). The secrecy surrounding the contract between the two corporations also compromised Waterfront Toronto's reputation. The only elected official on Waterfront Toronto's board, city councillor Denzil Minnan-Wong, went to great lengths to make public some details of the controversial 2017 legal agreement between Sidewalk Labs and Waterfront Toronto, against the desire of all other Waterfront Toronto board members (Levinson-King, 2018).

In mid-2018 the contract was replaced by a Plan Development Agreement (PDA) that expressly tasked a Digital Strategy Advisory Panel with nurturing and maintaining the project's social license. The panel's mandate under the PDA (Waterfront Toronto, 2019) is

to provide Waterfront Toronto with objective, expert advice to ensure that principles of ethical use of technology, accountability, transparency, protection of personal privacy, data governance and cyber security are upheld. While the Panel's advice is non-binding, its deliberations will be an important element in Waterfront Toronto building the trust it requires with civil society to achieve the social license necessary for a successful, and ethical, digital layer to be fostered as part of the Project. (p. 49)

Within 6 months of the advisory panel's establishment one of its high-profile members, Saadia Muzaffar, resigned, citing Waterfront Toronto's "apathy and utter lack of

leadership regarding shaky public trust and social license" (Muzaffar, 2018) and suggesting the panel had been unable to fulfill its mandate to hold Waterfront Toronto to account on questions of trust and privacy. Sidewalk Labs's claim to a social license had already come under scrutiny from critics, including open government advocate Bianca Wylie, who, prior to the release of the PDA in 2018, claimed that "the bottom line on social license is this: Sidewalk Labs doesn't have any in Toronto" (Wylie, 2018a). Not long after, Muzaffar and Wylie established the #BlockSidewalk campaign in early 2019, which has sought to encourage citizens to "tak[e] back control of our city and its future" and reaffirm that "democracy is not for sale" (#BlockSidewalk, 2009, paras. 4, 1).

The social license discourse in this debate highlights the particular private/corporate–public/government frictions inherent in the Sidewalk Labs development in particular, and in the smart-city paradigm generally. The concept of SLO emerged some 20 years ago, out of the corporate social responsibility and business ethics agenda, most notably in industries, like mining and resource extraction, facing "PR problems." To date, the concept has seen little to no application within research on smart cities, beyond its appearance in corporate discourse and public debates over the legitimacy of developments such as the Toronto Waterfront. Given that SLO has been a concept deployed both by proponents and critics of Sidewalk Toronto, we explore, and reflect critically on, the SLO concept, and propose how smart city governance might move beyond the corporate SLO model toward something approaching a legitimate, publicly granted social license to operate.

Many concerns about smart city developments revolve around their corporatized governance-business models that treat citizens as resources for data mining and data extraction. Therefore, it is not without irony that, in the late 1990s, the SLO concept emerged from mining and resource extraction contexts, at a time when community opposition was creating barriers to government approval for new or expanded mining projects, resulting in financial losses (Boutillier, 2014), and when there was growing recognition of the negative environmental and social impacts of these industries (Moffat, Lacey, Zhang, & Leipold, 2016). Since then, the SLO concept has been discussed and applied in a range of contexts including "oil and gas exploration and production, pipelines, renewable energy, farming, water use, ports, retailing" (Boutillier, 2014, p. 264), health (Carter, Laurie, & Dixon-Woods, 2015), forestry (Dare, Schirmer, & Vanclay, 2014), and various other energy industries (Moffat et al., 2016). According to Parsons and Moffat (2014) "the significance of a social license is commonly highlighted by reference to the *economic cost of its*

*absence*” (p. 345, emphasis added). Without a SLO, companies may face “obstacles that have a knock-on economic cost” such as protest, negative media attention, and reputational damage (Parsons & Moffat, 2014, p. 245). Ultimately, the SLO offers a way to manage community expectations, while advancing the primary objective of enabling “companies to conduct their activities relatively unencumbered” (Moffat et al., 2016, p. 481).

The literature on SLO (Boutillier, 2014; Moffat et al., 2016; Parsons & Moffat, 2014; Thomson & Joyce, 2008) emphasizes the economic impacts of a tarnished reputation by failing to obtain community trust, thereby using social legitimacy as risk mitigation (Boutillier, 2014). An organization is considered to be legitimate “when its operations and the organisational values and processes underpinning them meet stakeholder expectations and satisfy societal norms” (Dare et al., 2014, p. 188). Obtaining a SLO involves a basic level of acceptance to higher levels of trust, along the lines of legal legitimacy (via permits and permissions) and social legitimacy (via stakeholder engagement) (Thomson & Joyce, 2008). Legitimacy and credibility lead to trust, established by creating and working in partnerships across community, industry, and government through consultation and engagement (Foth & Adkins, 2006).

The SLO concept has not been without its critics, who have highlighted the way it can be deployed to legitimize socially and environmentally problematic corporate developments. Owen and Kemp (2013), for instance, critique the “inextricable link between industry’s survival instincts and the notion of a social licence,” which is often treated as “a mechanism to ensure the viability of the sector” and as a way to make hollow and PR-friendly “claims” for having met stakeholder expectations (pp. 29, 31). Accordingly, Owen and Kemp (2013) conclude, “the contemporary application of social license is more about reducing overt opposition to industry than it is about engagement and long-term development” (p. 34). In the context of the Sidewalk Labs development Wylie (2018b) similarly notes the risk of “engagement theater,” as do Goodman and Powles (2019) in relation to Sidewalk Labs’s orchestrated engagement campaign in response to #BlockSidewalk. Mattern (2020, February) warns of Sidewalk Lab’s “mapwashing,” where civic design tools “can be co-opted by savvy tech developers” and be “deployed as part of a public performance wherein the aesthetics of collaboration signify democratic process,” where the “disingenuous use of maps, apps, and other tools of participatory planning [...] threatens to undermine the democratizing, even radical potential of civic design” (para. 8).

Ultimately, the SLO concept may operate more as a performative technique to legitimize smart city

developments, and therefore, there is a risk of “SLO washing.” In the remainder of this article, we turn to the idea of *technological sovereignty* as a concept that might assist in moving beyond the corporate-leaning notion of the SLO toward democratic and more genuine citizen and collective engagement in the data-driven smart city, rejecting, and counteracting corporate SLO washing.

## 5 | BARCELONA’S APPROACH TO TECHNOLOGICAL SOVEREIGNTY

We advocate moving *beyond* a corporate notion of SLO for smart cities, and propose this can be achieved by ensuring citizens, and collectively the citizenry and the polity representing them, have *technological sovereignty*. The term technological sovereignty relates to “technologies developed by and for civil society, and the initiatives that form it attempt to create alternatives to commercial and/or military technologies” (Hache, 2014, p. 168). The definitions of technological sovereignty and data sovereignty are contested, and we acknowledge that they have different meanings for different groups, yet we use them here to refer to ownership and control over personal data, and how technologies can be used to “promote autonomy” whether at an individual or collective level (i.e., group, city, nation) (Hache, 2014, p. 169). Indeed, “sovereignty” itself is a contested term in both “analogue”<sup>2</sup> and digital contexts. This has been recently demonstrated by Couture and Toupin (2019) who argue its use differs as it is advanced by different groups. Despite this, it generally describes “various forms of *independence, control, and autonomy* over digital infrastructures, technologies, and data” and “*collective* control on digital content and/or infrastructures” (Couture & Toupin, 2019, p. 1, emphasis added). Similarly, according to Lynch (2020) when applied to technology, sovereignty is “about building alternative models of developing, producing, and consuming technologies that are transparent, *democratic*” (p. 11, emphasis added). It promotes technological practices that differ from governmental approaches (Couture & Toupin, 2019), inspired by the *political* relationships between technology and communities. In the context of social movements, it can “affirm the autonomy of social movements through *collective* (and sometimes individual) control of technologies and digital infrastructures and especially their power to develop and use tools which have been designed by them and/or for them” (Couture & Toupin, 2019, p. 11, emphasis added).

Technological sovereignty aims to invert asymmetrical *power relationships* (i.e., it is political) between corporations, governments and data subjects, while providing avenues for greater citizen and citizenry autonomy.

Initiatives that aim to support technological sovereignty set out to empower citizens and the citizenry as the main drivers of social and urban innovation and transformation (Hache, 2014, p. 169). Economic aspects of these initiatives operate through alternative economic models (i.e., collaborative, open source, commons, and cooperatives), that are concerned with social and community wellbeing (Lynch, 2020), rather than corporate bottom lines. Therefore, technological sovereignty challenges “traditional notions of labour and property, and divisions between producers and consumers” (Lynch, 2020, p. 11). It can be understood as an alternative city/platform configuration (Leszczynski, 2020), inhabiting the space of postcapitalist, prefigurative urban politics (Lynch, 2020).

In sum, the concept of technological sovereignty, as we understand it on the basis of reviewing the aforementioned literature, relates not only to personal autonomy and empowerment and a way of responding to “anxieties of control,” but is also about collective empowerment and democratic governance (i.e., commons, collaborative, collective organization at various scales). Individuals make up collectives, and for there to be technological sovereignty at a collective level these larger entities should be governed and operate in a democratic way (i.e., self-governance), and this can happen with the assistance of (decentralized) technology, too. In this way, and in a direct attempt to invert asymmetric power imbalances that tend to lead to corruption, economic dominance and neocolonialism, technological sovereignty is principally a political intervention. We now turn to the city of Barcelona as an example of technological sovereignty in (political) practice.

The City of Barcelona stands out internationally as a smart city that aims to harness technology to empower citizens. This has been led by Francesca Bria, the Chief Technology and Digital Innovation Officer for the City of Barcelona. Bria advocates for technological sovereignty and the use of technology in order to increase citizens' capacity (as both individuals and collectives) to design the city's technological and nontechnological infrastructure to inform the ends that it serves (see Morozov & Bria, 2018, p. 22). The Barcelona Digital City Plan (Ajuntament de Barcelona, 2019) aims to transcend mere technological objectives, to rethink a smart city that serves its citizens, by grounding technology “at the service of people and not people at the service of technology” (p. 6). The main public policy actions outlined in the plan encompass establishing Barcelona as a global city of commons and collaboration production, by ending privatization and promoting remunicipalization of critical urban infrastructure. This will build data-driven models of the economy, including a city data commons, and promote collective collaboration above centralized state and market solutions.

The goal is to “use digitisation to benefit all citizens and transition towards a more sustainable, democratic, equitable and circular city” that is “committed to innovation and sees the city as an urban platform for establishing connection... to contribute to solving the city's pressing social and environmental problems” (Ajuntament de Barcelona, 2019, p. 33). Technological sovereignty and data sovereignty are at the heart of the Barcelona Digital City Plan (2015–2019) and the Digital Barcelona Plan (2017–2020; Bria, 2016). The initiatives are described as providing the “capacity to decide” (Galdon, 2017), via governance frameworks and technological solutions that promote citizen capacity to know what is happening, and control the flow of their personal information. This involves *discerning* and *directing* their personal data, as per Leszczynski's *anxieties of control*. According to the Deputy Mayor of Barcelona Gerard Pisarell, “In a democratic city, technology should serve to digitally empower citizens, to protect their privacy from abuses by the public and private powers. [...] That has a name: conquering technological, digital sovereignty, for the common good” (as quoted in Galdon, 2017, para. 4, March & Ribera-Fumaz, 2018, p. 235).

Most notably, this is a bottom-up approach to local governance that engages directly with the community via the platform Decidim (2019), which is a free and open source platform for participatory democracy allowing citizens to propose, participate and vote on decision-making initiatives. That is, self-governance as a collective city. It was developed by citizens, activists and technologists, and is now being used by governments across Europe (Lynch, 2020). It maintains features for strategic planning, consultations, networked communication, and participatory budgeting (Stortone & De Cindio, 2015). In addition to *Decidim*, Bria has founded the “DEcentralised Citizen-Owned Data Ecosystem” (DECODE) project. DECODE (2017) has been trialed in both Amsterdam and Barcelona, with pilots running between 2017 and 2019. DECODE is similar to a data commons or cooperative (Bloom, 2013; Carballa Smichowski, 2019; Miller, Styles, & Heath, 2008; Robinson, Rittenbruch, Foth, Filonik, & Viller, 2012), which gives individuals and collectives more control over their personal data. The project explores how to “build a data-centric digital economy where data that is generated and gathered by citizens, the Internet of Things (IoT), and sensor networks is available for broader communal use, with appropriate privacy protections” (DECODE, 2017). A system of licenses authorize the collection and use of data, and citizens are informed and collectively decide about how the community benefits from the uses of their data.

These initiatives demonstrate the ways in which data are considered as a public resource, where citizens retain ownership of their data, and can inform the purposes for



which it is collected and used (Lewin, 2018). Regulatory instruments such as the use of procurement law and policy ensure public ownership of city data is retained, with specific clauses introduced into city contracts that support technological sovereignty. For example, a contract between the city and telecommunications company Vodafone dictates that Vodafone must return machine readable data to the local government so that citizens may use it, rather than keeping and mining it for its own commercial purposes (Graham, 2018). This can be contrasted with the Sidewalk Labs development, where public datasets are freely handed to corporations (Goodman & Powles, 2019). These legal and policy measures, paired with new technologies and processes for transparent, democratic and accountable governance (of the city, its digital platforms and its data), reverse the extractive and asymmetric relationship between service providers and citizens, while putting data and its economic and social values back into the hands of citizens.

While the above initiatives are spearheaded by the municipal government, Barcelona has a history of activism, with the technological sovereignty movement rooted in anti-capitalist struggles that produced other autonomous grassroots movements (c.f. Lynch, 2020). Beyond individual rights to privacy and participation, technological sovereignty movements seek to (re-)appropriate technology to (re-)configure capitalist techno-social relations and democratic urban governance through new power dynamics across government and the citizenry, recognizing the limitations and dangers of solely relying on current forms of administrative power (Lynch, 2020). Approaches to enhancing technological sovereignty are not without limits. For example, it is difficult to engage individuals in such initiatives and with contested notions of state sovereignty (cf., neocolonialism). It is also difficult to scale them beyond cities to larger collectives such as nation states (Frauenberger, Foth, & Fitzpatrick, 2018). However, EU leaders have expressed concerns around reduced national sovereignty as a result of global data networks largely owned by US and Chinese technology companies (Laurent, 2019). Further, while not always the case (e.g., Barcelona's use of procurement law), such approaches may eschew law and regulation (i.e., legal mechanisms for protecting data or privacy) in favor of a "hacktivist" approach of using technology toward social and political ends. The required specialist knowledge can alienate especially marginalized segments of society, unless the movement is rooted in broad participation *and* in people's everyday lived experience of the city (Caldwell & Foth, 2014; Fredericks, Caldwell, Foth, & Tomitsch, 2019). Finally, there is a risk of techno-deterministic responses to deep rooted social problems, when arguments about the need to *decenter* technology are starting to emerge (Peña Gangadharan & Niklas, 2019).

## 6 | CONCLUSION

This article reviewed a range of civic issues that emerge from recent smart city developments, arguing against the treatment of citizens as an extractive resource for corporate data collection. Tensions between private and public interests require upholding both facets of citizenship in smart cities (Foth, 2018). Citizens must offer up some of their privacy as part of the social contract with the state. Developments that place private companies as intermediaries and profiteers extracting and mining data as a resource, fundamentally reconfigure this relationship. This has implications for the concept of a social license to operate, as witnessed with Sidewalk Labs's contested Toronto Waterfront development. Our examination of new ways the SLO concept might be applied and extended within the smart city paradigm, remains critical of this concept and the risk of SLO washing. Rather, we argue that a way to respond to *anxieties of control* is to advance *technological sovereignty* by placing greater emphasis on the public and common, rather than private (and individual), interests in urban developments.

## ACKNOWLEDGMENTS

We thank our project partners: Consumer Policy Research Centre, ThoughtWorks, Queensland Office of the Information Commissioner, and Hack for Privacy. We acknowledge and thank Dr. Kayleigh Murphy for her excellent research assistance and Dr. Ian Warren and our peer reviewers for comments and feedback on an earlier draft. We are grateful for financial support from the QUT Strategic Links with Industry Pilot program and the QUT Engagement Innovation Grant scheme.

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## ENDNOTES

<sup>1</sup>We recognize in this paper that the terms "citizen" and "citizenship" have a certain semantic instability that registers the historical shift in the locus of democratic governance from the city-state of Classical antiquity to the modern nation-state. As Isin (2000) notes, the idea of citizenship "originated in the city" (p. 7), or, perhaps more properly, in the city-state, which was "much more than a city; it was an independent, sovereign political unit" (Dagger, 1981, p. 721) offering both rights and obligations to its citizens. In this article, we use the term 'citizen' with its primary dictionary definitional meaning in mind—that of "an inhabitant of a city or town; *esp.* one possessing civic rights and privileges" (Oxford English Dictionary 2014, section n. 1a). We recognize, however, that the term has a parallel common meaning that reflects the historical trajectory from city-state to nation-

state, that is, the idea of the citizen as “a legally recognized subject or national of a state, commonwealth, or other polity, either native or naturalized, having certain rights, privileges, or duties” (Oxford English Dictionary 2014, section n. 2a). We recognize that, in using the term “citizen” in this city-focused way, and particularly in the examples of the two case study sites, it extends to include city dwellers who may not have state-granted legal citizenship, but who nonetheless participate in various forms of urban citizenship (Baubock, 2003; see, for instance, Smith & McQuarrie, 2012). We also acknowledge the often precarious status and vulnerability of those city residents without formal citizenship status.

<sup>2</sup>See for example: The examination by Geenens (2016) of various political and legal conceptions of sovereignty. Although these meanings are varied, the concept generally relates to notions of power and authority. We also acknowledge that First Nations peoples have various conceptions of sovereignty also, including Indigenous Data Sovereignty (Cunneen, 2011; Kukutai & Taylor, 2016). This is important to consider in the context of Smart City impacts on First Nations peoples, for example, O'Malley and Smith (2019) consider the Darwin Smart City strategy in Australia a continuation of neocolonialism and a further exertion of power and control into their (data) sovereignty.

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**How to cite this article:** Mann M, Mitchell P, Foth M, Anastasiu I. #BlockSidewalk to Barcelona: Technological sovereignty and the social license to operate smart cities. *J Assoc Inf Sci Technol*. 2020; 71:1103–1115. <https://doi.org/10.1002/asi.24387>