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Can a Smart City Exist as Commons?

The Case of Automated Governance in Sidewalk Toronto

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INTRODUCTION

In October 2017, Alphabet and the Government of Canada announced a joint effort: the first smart city powered by Alphabet's technology. The smart city was proposed to be built in Toronto, Canada, where Alphabet's subsidiary Sidewalk Labs had partnered with public corporation Waterfront Toronto. The press release envisioned Sidewalk Toronto/Quayside[1] as an exemplary community employing digital technology to tackle the issues of urban growth:

> Sidewalk Labs and Waterfront Toronto announced today "Sidewalk Toronto," their joint effort to design a new kind of mixed-use, complete community on Toronto's Eastern Waterfront. Sidewalk Toronto will combine forward-thinking urban design and new digital technology to create people-centered neighborhoods that achieve precedent-setting levels of sustainability, affordability, mobility, and economic opportunity. (Waterfront Toronto 2017)

In May 2020, Sidewalk Labs withdrew from the deal, citing financial uncertainty brought on by the Covid-19 pandemic. The project was canceled after the two and a half years of heated public controversy over the company's plans for data collected in the project and the secret financial commitments of the parties (Goodman and Powles 2019; Artyushina 2020a; Valverde and Flynn 2020).

In Canada, the failure of the ambitious public–private partnership prompted a series of legal and administrative reforms. Major amendments to Canada's data protection legislation have been suggested, to account for the privacy challenges associated with the use of personal data in data analytics, and the data collection in

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[1] Sidewalk Toronto was redubbed Quayside, with the former being a project name for the partnership between Sidewalk Labs and Waterfront Toronto and the latter being a local toponym for the 12-acre swath of land at the foot of Parliament Street in Toronto, where the smart city was planned to be built.

public and semi-private spaces (Government of Canada 2020). In July 2020, the Government of Ontario launched its first data trust that provided researchers with access to the medical data related to Covid-19.[2] Unlike the data trusts proposed by Sidewalk Labs that would make possible commercial reuse of personal data (Artyushina 2020b; Scassa 2020), the Ontario Health Data Platform (OHDP) secured the rights of the provincial government to digital information and intellectual property developed in the project; the trust only granted access to the data for research purposes. After a series of public consultations on the procurement of smart cities, Toronto launched the Digital Infrastructure Plan (City of Toronto 2021). The DIP requires all city departments commissioning products from smart city vendors to prioritize open-source products and technologies that can be maintained by the city staff.

While Sidewalk Toronto never became an exemplary smart city, its global political relevance is undeniable: some European municipalities consider it a cautionary tale, while others seek to implement the partnership's innovations: data trusts and automated planning (Artyushina 2020b; Wolpow 2021; AI4Cities 2021).

It is useful to consider the smart city proposal an innovation testbed in the areas of urban technology and administration. The sole sourcing developer of Sidewalk Toronto had envisioned the automation of many city services and the governance of smart infrastructure as commons where city assets are run collectively though several trusts. While the proposal didn't provide detailed layouts for the organization and representation mechanisms in these trusts, Sidewalk Labs had identified some possible models of collective action in smart cities.

An emerging city resource, smart infrastructure constitutes a serious governance challenge to policymakers and private vendors (Alizadeh, Helderop, and Grubesic 2020; Barns et al. 2017). Data is a nonrivalrous resource, but smart systems also require algorithms, pipes, and cables, as well as access to public spaces and facilities. Contrary to the popular economic argument that private governance is the most efficient way to run city infrastructure, Brett Frischmann (2012) makes the case for the governance of infrastructure as commons. When public or private systems are employed by multiple communities, they produce massive social outcomes. The Internet and telecommunications are the perfect examples.

In this chapter, I draw on the Governing Knowledge Commons (GKC) framework to examine the partnership's vision for the automated[3] and commons governance in the smart city. Balancing public, private, and collective interests in smart cities is a challenging task, which is why Sidewalk Toronto proposed some innovative instruments of governance and management in its city infrastructure. However,

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[2] As of 2022, the mandate of the Ontario Health Data Platform, which operated under the Ontario Emergency Act, is over.

[3] Here and throughout the text, the term "automated governance" refers to governance by algorithms. To avoid confusion, the term "data governance policies" refers to the governance of algorithms.

as I show in this chapter, failure of the partnership was inevitable as the leaders of the project prioritized maximizing Alphabet/Sidewalk Labs' profits over other objectives. Moreover, I argue, data-driven planning would likely stifle every possibility of collective action, set to eliminate both the public space and the public in the smart city.

METHODOLOGY

This chapter derives from my ongoing dissertation research, which began in 2017 when the partnership between Waterfront Toronto and Sidewalk Labs was announced. Many recent studies point to the post-political nature of the smart city (Gabrys 2014; Cardullo and Kitchin 2019; Carr and Hesse 2020), and some scholars (Kitchin 2021; Cardullo, Di Feliciantonio, and Kitchin 2021) urge an opening up of the decision-making in and around smart cities to democratic deliberations. Yet it is not an easy task to "politicize" smart cities. Complex technological systems, their data streams, controls, and beneficiaries, are often hidden from view and protected from any intervention. This is where the Governing Knowledge Commons framework proves to be immensely useful as it sheds light on the informal organizational and institutional aspects of the smart city governance.

The GKC framework adapts Elinor Ostrom's Institutional Analysis and Development (IAD) framework for natural resource commons (Ostrom 1990) to study the commons-based knowledge production (Frischmann, Madison, and Strandburg 2014), biomedical research (Strandburg, Frischmann, and Madison 2017), data governance (Madison 2020), privacy (Sanfilippo, Frischmann, and Strandburg 2021), misinformation (Chapter 1 in this volume), and now smart cities. The attributes of shared resources, governance strategies, values of the actors and communities, action arenas, rules-in-use, and legal institutions that affect or uphold the commons – these are the key considerations of the GKC framework. It is the new forms of governance in the smart city that I am exploring in this chapter.

Information about the data collection:

- In March–November 2019, the partnership conducted a series of public engagement events, where different iterations of the proposal were discussed. I conducted participant observation at four events. The notes taken at the meetings have been manually encoded using the methodology of inductive coding (Saldana 2015). The recordings of the meetings released by the partnership are available on YouTube under the titles "Sidewalk Toronto: First Public Roundtable," "Second Public Roundtable," "Third Roundtable," and "Quayside Public Consultation."
- The second set of participant observation data comes from the meetings of an advisory panel appointed by Waterfront Toronto to help evaluate the project, the Digital Strategy Advisory Panel (DSAP). I attended three

meetings that took place during 2019 and were open to the public. Similarly, the notes taken at the meetings were manually encoded. I was also provided access to the draft and public reports of the committee.

- Beginning November 2017, I conducted qualitative analysis of the documentation released by Sidewalk Labs, Waterfront Toronto, Government of Ontario, City of Toronto, as well as the media coverage of the project in and outside of Canada. Specifically, the analysis covers such items as the "Project Vision," "Master Innovation and Development Plan" Vols. 2, 3, 5, "Plan Development Agreement," "Framework Agreement," the "Ontario Auditor General Report," investigations published by *The Globe and Mail*, *Toronto Star*, *The New York Times*, etc.
- Between January 2021 and July 2021, I conducted seventeen interviews with the employees of Sidewalk Labs, government officials who were appointed to evaluate the project, privacy lawyers, and the citizens who had organized against the smart city. The interviews have been transcribed and encoded, using computational linguistic software, Descript and NVivo.

THE BACKGROUND

In the Sidewalk Toronto partnership, Waterfront Toronto outsourced many functions to Sidewalk Labs (e.g., public engagement, drafting of the smart city and data governance policies for the project, communication with the provincial and city governance, etc.). Therefore, it is not always possible to separate the two parties in this project. Over the project's short life span, Waterfront Toronto changed its attitude toward Sidewalk Toronto from widely publicized support to conditional approval, and then to public criticism of the company's attempts to monopolize governance in the project. In this section, I briefly tell the story of the smart city project and address the factors that ultimately led to its collapse.

Waterfront Toronto is a nonprofit corporation established in 2001 by the municipal, provincial, and federal government to oversee the development of Toronto's waterfront. Waterfront Toronto has an unusual legal structure. Despite being a corporation, it has no shareholders; decisions are made by the board of directors. According to some of the corporation's employees, this might have led to Sidewalk Labs effectively dominating the partnership:

> Examine the Waterfront Toronto legislation and it will very explicitly say that Waterfront Toronto is not an agent of any level of government. Waterfront also indemnifies the three levels of government. No level of government was required to sign off on the Framework Agreement or the PDA. The only role three levels of government would have had was to offer regulatory approvals such as code

compliance, public works compliance, but even then, it appears in the Master Innovation Development Plan that the proponent wanted their own "regulatory regime" as in fourteen months. (Respondent, February 2021)

In 2024, Waterfront Toronto reaches the end of its funding cycle, and it has been actively looking for a private funding partner. Several of my respondents noted that Waterfront Toronto was deeply committed to the partnership with Alphabet/ Sidewalk Labs:

> When Google came to town, everyone was excited. So maybe, maybe they handed over too much to it, but it might've been, you know, in the excitement of the moment. It's hard to push back against these, these behemoths. (Respondent, May 2021)

The negotiations over the plot of land along Toronto's eastern waterfront unofficially began in 2016, when an employee of Waterfront Toronto had reached out to Sidewalk Labs. A year later, Waterfront Toronto released the request for proposals to develop a smart city on the twelve-acre site along Lake Ontario. To make sure that Sidewalk Labs would be awarded the project, several employees of Waterfront Toronto aided Sidewalk Labs in the preparation of its proposal (Government of Ontario 2018).

Sidewalk Toronto received backing on the federal level. Prime Minister of Canada Justin Trudeau publicly endorsed Sidewalk Toronto and mentioned that he and Eric Schmidt, then CEO of Alphabet, had been discussing this project for several years (Hook 2017). The support of the federal government was instrumental in the way Sidewalk Labs has been positioned in the project. In October 2017, the board of directors of Waterfront Toronto had planned to vote on the proposal. At the request from the Office of the Prime Minister Justin Trudeau, the trustees were given only three days to review and accept the proposal. The board members who voiced their concerns over the lack of the due diligence were asked to resign from their positions (O'Kane 2018).

Backed by the highest office in the country, the Sidewalk Toronto partnership showed surprising disregard for the local government (Valverde and Flynn 2020). For the first eight months of the project, Sidewalk Toronto did not share any project documentation with the Government of Ontario, nor with the City of Toronto (Goodman and Powles 2019). Investigation conducted by the General Auditor of Ontario, Bonny Lysyk (2018), revealed that Sidewalk Labs' parent company "has purportedly told other candidate communities that they want to control all data in this demonstration project area"; her investigation also revealed that employees of Waterfront Toronto who had assisted in the preparation of Sidewalk Labs' proposal acted in direct violation of the rules of open competition for the public assets. Once the investigation was released, Premier of Ontario Doug Ford fired the CEO and Chair of Waterfront Toronto over the deal with Alphabet/Sidewalk Labs.

Members of City Council Joe Cressy and Paula Fletcher repeatedly raised issues regarding the lack of transparency in the procurement of the project and the use of surveillance technologies in the proposed smart city. The conflict between the partnership and the local officials reached its peak in 2020, when the City of Toronto began looking for a legal loophole to shut down Sidewalk Toronto.

Over the two and a half years of the project's existence, the partnership had produced several hundred lengthy documents discussing its vision of urban planning, such as affordable housing, the commons governance of smart infrastructure, and timber-wood buildings. However, these documents rarely mentioned any specific technologies the partnership had planned to implement, data governance strategies, or the financial aspects of the deal.

The secrecy around the project had prompted a heated public controversy in Canada, where activists, journalists, and academics would piece together available information about the proposed technologies and resources at stake. Canadian open government advocate and activist Bianca Wylie was the leader of the pan-Canadian anti-Sidewalk Labs movement called #BlockSidewalk (Zarum 2019). Critics of the project expressed concern about the privatization of public spaces and services, as well as ubiquitous digital surveillance in the proposed smart city (Wylie 2017, 2018, 2020; Balsillie 2018; O'Kane 2018).

It was not easy, however, to publicly oppose the project. The company heavily invested in the positive media coverage and hired several internationally renowned academics as paid consultants. Several local experts were promised research funding and lucrative positions once the smart city had been developed. As one of my respondents remembered, when the Canadian Civil Liberties Association (CCLA) sued the three levels of government over the deal with Alphabet/Sidewalk Labs, they had to engage several international experts as witnesses. All but one of the Canadian experts they contacted refused to testify against the partnership.

Reportedly, Sidewalk Labs committed US$50 million for preparation of the proposal and the citizen engagement campaign (Bozikovic 2017). As a funding partner in the future smart city, the company planned to attract $3.9 billion in financing and a line of credit, including $900 million required to build the proposed real estate and smart infrastructure, and an additional $400 million to expand the subway to the eastern waterfront (Sidewalk Toronto 2019, Vol. 3, 31). In exchange, Sidewalk Labs requested the intellectual property and licensing rights in the data collected in the smart city, the 190-acre plot of land to extend the smart city into the Port Lands (with the land being sold at a discounted price), performance payments for advisory and engineering services, and the compensation for infrastructure at a market price (Muzaffar 2018; Sidewalk Labs 2018; Vincent 2019). Additionally, the contracts between Sidewalk Labs and Waterfront Toronto precluded Waterfront Toronto from considering other partners for the project before the Master Development Innovation Plan was submitted.

In October 2019, the board of directors of Waterfront Toronto moved to accept the deal with Sidewalk Labs, although with major cuts (O'Kane 2019). Specifically, the newly appointed leadership of Waterfront Toronto rejected the company's proposal for the new governing entities in the project and requested that all data collected in the smart city be subject to Canada's privacy and data protection legislation. In May 2020, Sidewalk Labs withdrew from the deal.

<div align="center">THE OUTCOME-BASED PLANNING</div>

The data-driven planning tool that would allow the developers to remake the smart city on the go was called the "outcome-based code."[4] The software was expected to replace within the confines of the smart city "outdated" zoning and building codes of Ontario (Bowden 2018; Sidewalk Labs 2017; Sidewalk Toronto 2019, Vol. 2, 21). In a city planned by data, both the city infrastructure and the community should be versatile by design and receptive to the market signals. The developer should be able to swiftly repurpose the lands, city spaces, and buildings to maximize the profits. For instance, a park may be redeveloped into a mall or a parking lot if data suggests the land will soon see an increase in value. The new simplified building codes would blur the line between the residential and nonresidential spaces, so that any building could be put to different uses.

The first mention of the outcome-based code can be found Sidewalk Labs' winning bid, the Project Vision (Sidewalk Labs 2017). In the 200-page document, Sidewalk Labs correctly identified the high cost of living in the city and traffic management as Toronto's key problems. To address these issues, the company's software would replace traditional zoning and building requirements and provide Sidewalk Toronto with some flexibility to achieve the market value of property and land in the city:

> This new system will reward good performance, while enabling buildings to adapt to market demand for mixed-use environments. It is Sidewalk's belief that outcome-based codes, coupled with sensor technology, can help to realize more sustainable, flexible, high-performing buildings at lower costs. (Sidewalk Labs 2017, 120)

In the Province of Ontario, cities are divided into single-use zones to avoid negative externalities associated with the mixed use of space. For instance, it is illegal in Ontario to build a chemical plant in a residential neighborhood, or a safe-injection clinic in the vicinity of a public school. Ontario's building code is a piece of legislation that governs the construction, renovation, and change-of-use of a building in the province (Government of Ontario 2019). The code stipulates specific safety and convenience requirements deemed necessary for the residential buildings. For example, developers must protect residents' rights to daylight, privacy,

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[4] The data-driven tool is currently sold by Replica, Sidewalk Labs' spin off.

security, and silence. Since the 1990s, the walls and ceilings of the residential buildings cannot contain the toxic material asbestos.

In the Vision, Sidewalk Labs (2017) offered to replace the "restrictive" state regulation with data-driven planning. Rather than limiting multi-use spaces, the company offered to set minimum standards for comfort and environmental harms. In Sidewalk Toronto, industrial uses could be placed in residential areas but would be fined if the data showed lack of compliance on the part of the developer or business owner. The sensors embedded in the fabric of the city would monitor energy use, light conditions, and pollution, as well as collect real-time information about the users of city spaces. To take an example provided by the company, instead of respecting the residents' rights to light, developers would be allowed to come up with "creative solutions" such as automated canopies. Sidewalk Labs promised that the buildings in the smart city would be monitored throughout their lifecycle, and the use of certain solutions could be restricted based on the user reports and algorithmic assessments.

In his damning critique of the outcome-based code, digital media theorist Evgeniy Morozov argues that the long-term goal of Sidewalk Labs was to extinguish any forms of social organization in the city:

> Even neoliberal luminaries such as Friedrich Hayek and Wilhelm Röpke allowed for some non-market forms of social organisation in the urban domain. They saw planning – as opposed to market signals – as a practical necessity imposed by the physical limitations of urban spaces: there was no other cheap way of operating infrastructure, building streets, avoiding congestion. For Alphabet, these constraints are no more: ubiquitous and continuous data flows can finally replace government rules with market signals. (Morozov 2017)

As a form of governance, commons can operate in the commercialized, private and semi-private environments (Frischmann 2012, 67). In Sidewalk Toronto's Master Innovation and Development Plan (MIDP) (Sidewalk Toronto 2019, Vol. 3), the private, automated city governance and the commons are not mutually exclusive. Communities are encouraged to provide inputs for the outcome-based code and take advantage of the data analytics, to generate monetary and nonmonetary value from the city spaces. Many use cases in the MIDP describe an array of business opportunities for the residents – as a form of community-building in the smart city (Sidewalk Toronto 2019, Vol. 2). Through the new governance entity, called the Open Spaces Alliance (OSA), citizens would offer their own visions for the common areas, and gauge their business potential. As a new governing agency, the OSA was expected to have an operating budget to procure the necessary services from Sidewalk Labs (Sidewalk Toronto 2019, Vol. 2, 179). Stoa, another planning innovation by Sidewalk Labs, was an open-concept market that encouraged community engagement around local businesses (Sidewalk Toronto 2019, Vol. 2, 155). Marketed by Sidewalk Labs as a commons, Stoa promised to reinvent the ground

floors of the buildings to become business opportunities and recreation spaces for the residents.

Sidewalk Labs envisioned the data-driven planning would require "four strategies for meaningful reform" (Sidewalk Labs 2017, 121): simplification (residential and nonresidential buildings are subject to the same building requirements); flexibility (municipal codes will be updated based on market performance); interoperability (data-driven rules apply to both public and private spaces); and automated permitting review.

Yet the data-driven planning does something more than simply clear the planning process of the state bureaucracy; its true objective is to put the data controller in the position of a regulator. In a community planned and run by data, the outcome-based code becomes a form of social ordering (Katzenbach and Ulbricht 2019).[5] In Sidewalk Toronto, the algorithms would be sensitive to misbehavior and noncompliance. Throughout the project's voluminous documentation, the partnership suggests multiple ways the software would reward compliant users and punish misbehavior:

> As an alternative to traditional regulation, Sidewalk envisions a future in which cities use outcome-based code to govern the built environment. This represents a new set of simplified, highly responsive rules that focus more on monitoring outputs than broadly regulating inputs. With embedded sensing for real-time monitoring and automated regulation, this new code will reward positive behaviors and penalize negative ones, all while recognizing the value residents and visitors increasingly place on having a variety of uses within one neighborhood. (Sidewalk Labs 2017, 139)

Sidewalk Labs envisioned technology companies partnering with behavioral scientists to create a "feedback loop," where human behavior is understood, predicted, and proactively shaped by the data controller, (Sidewalk Labs 2017, 31). In the MIDP (Sidewalk Toronto 2019, Vol. 2, 351), Sidewalk Labs introduced a use case: the "Pay-as-you-throw" smart disposal systems, where the data about a household is used to set differential pricing.

It is important to remember that Sidewalk Labs entertained the idea of a social credit system in the smart city. The leaked internal document, Yellow Book, was prepared by Sidewalk Labs for Alphabet to probe the ways to commercialize Sidewalk Toronto. Published by the *Globe and Mail* (Cardoso and O'Kane 2019), the Yellow Book details that the ubiquitous sensors embedded into the fabric of the city would collect both real-time and historical data about the residents. Residents would be rewarded for voluntarily sharing data with the company, where one's digital reputation would be "new currency for community co-operation." Residents who chose to opt out of data collection would be cut off from certain services.

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[5] See further discussion about the concept of "algorithmic governance" in O'Reilly (2013) and Gorwa, Binns, and Katzenbach (2020).

Moreover, Sidewalk Toronto wanted to have private police forces, and to use data to prevent crimes and misdemeanors. In general, the document suggests that Sidewalk Labs saw private control of city infrastructure as having "enormous potential for value generation in multiple ways" (Cardoso and O'Kane 2019).

The smart city technologies show enormous potential in shaping and molding human behavior (Vanolo 2014; Hollands 2015; Sanfilippo and Shvartzshnaider 2021). Reflecting the concept of techno-social engineering (Frischmann and Selinger 2018), automated governance seeks to create a compliant, easily controlled subject. It is safe to assume that, in a few years, Sidewalk Toronto residents would be comfortable sharing their banking information with the company in exchange for a reduced electricity bill. Even if a person decided to stand up against the data-driven decisions, in a city that is constantly reshuffled by algorithms there may not be a community to act with. Moreover, in a closely monitored physical environment where a resident's credit score is their currency, any collective activity will likely be stifled.

A COMMONS APPROACH TO THE SMART CITY

In this section, I analyze the partnership's proposal for the new governance bodies in the smart city. The smart city as digital commons can certainly exist and, when designed properly, the instruments of collective governance may help balance the interests of citizens, government, and businesses. Yet the instruments of collective governance offered by Sidewalk Toronto effectively disenfranchised the public from any rights to the smart city.

Sidewalk Labs CEO Dan Doctoroff's testimony before the Ethics Commission of the House of Commons of Canada discussed at length the issue with Canada's data protection legislation being inadequate in meeting the challenges brought on by the smart city partnership (House of Commons of Canada 2019). In this meeting, Mr. Doctoroff called for some new legal instruments that "would not stifle innovation." In the MIDP, the partnership suggested establishing new governance entities that would mediate between the technology vendor and Canadian authorities and help members of the community collectively govern and manage the smart city infrastructure. These five new bodies of collective governance were the Urban Data Trust, the Waterfront Housing Trust (WHT), the Open Space Alliance (OSA), the Waterfront Transportation Management Association (WTMA), and the Public Administrator (PA).

Although the Sidewalk Toronto partnership never specified the ways residents could get representation through the trusts, the company did set out the goals of the proposed entities. My analysis shows that the trusts benefitted some members of the community more than others. Specifically, Sidewalk Labs openly declared its goal to support developers in the project, as well as the businesses coming to operate in the smart city.

My previous research on the Urban Data Trust (Artyushina 2020a) draws on the rentiership theory (Birch and Muniesa 2020; Birch et al. 2020) to explore the data governance policies in Sidewalk Toronto. My analysis demonstrates that, as an instrument of collective governance, the Urban Data Trust was imbued with conflicting goals of making profit from data collected in the smart city and protecting citizens' privacy. As part of its proposed digital innovation plan, Sidewalk Labs was seeking ways to reconceptualize personal data collected in the smart city as a private asset. Canadian privacy lawyer Teresa Scassa (2020) raised an issue with the concept of "urban data" as devised by the partnership. By introducing new, quasi-legal concepts, the proposal would make the data collected in the smart city exempt from Canada's privacy legislation. Neither Sidewalk Labs nor Waterfront Toronto specified the legal framework for the trust. Earlier versions of the proposal (Waterfront Toronto 2018) mentioned that the trust would have fiduciary obligations toward the residents; however, subsequent documentation had clarified that the Urban Data Trust was never meant to be a trust "in a legal sense" (Sidewalk Toronto 2019, Vol. 2, Ch. 5, 423).

The real estate in Sidewalk Toronto would be governed by the Waterfront Housing Trust (Sidewalk Toronto 2019, Vol. 2, 284). Sidewalk Labs released an ambitious affordable housing plan in which 40 percent[6] of the residential units in the smart city would be sold or rented below market price. The trust would assemble funding from a variety of private and public sources and direct this funding toward the below-market housing in Sidewalk Toronto. According to the partnership, this would increase the returns and predictability for developers.

The proposed affordability plan received mixed reactions. Toronto Mayor John Tory called the company's affordability plan "encouraging," stating: "I am determined to build more housing in Toronto to help address affordability issues" (Vincent 2018). Local developers and urban planners were less optimistic. Toronto developer Julie Di Lorenzo, who resigned from the board of directors of Waterfront Toronto over the deal with Sidewalk Labs, said in an interview with the *Toronto Star* that the proposal was not in the interest of the citizens: "How will that be subsidized? Are there subsidies by our government, or are they using the land value of Quayside to subsidize the housing? If the land value of Quayside is being used to subsidize the land value, it is the choice and contribution of our governments – not Sidewalk" (Vincent 2018). Former Toronto Chief Planner Jennifer Keesmaat criticized the company for overpromising:

> Sidewalk breaks down their plan like this: five per cent of units will be deeply affordable, or at least 60 per cent below market rate. Another 15 per cent will be affordable as defined by the city – at or below the average market rent – and the final 20 per cent will be affordable for middle-income households. But people on a

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[6]   As Sidewalk Labs has removed the affordable housing proposal from company's website, please refer to the media coverage of the document (e.g., Vincent 2018; O'Kane and Bozikovic 2018).

minimum-wage salary can't even afford an average-priced one-bedroom apartment. Even if Sidewalk's second tier of affordability is on par with the market, these homes are wildly overpriced compared to Canadian wages. It's even more ridiculous to suggest that the homes designed for middle-class households are affordable by any stretch of the imagination. In a real estate economy as hot as ours, affordability cannot depend on the market. The city of Toronto needs to make the definition match the reality. (Keesmaat 2019)

The Open Space Alliance was another instrument of collective governance proposed by Sidewalk Toronto (Sidewalk Toronto 2019, Vol. 2). The OSA was set to help Sidewalk Labs and the community govern and manage the streets, parks, and recreation zones. In this blueprint for a future smart city, data would help the developers identify new "open space assets" and the OSA would create opportunities for more retail and recreation (Sidewalk Toronto 2019, Vol. 2, 184). The partnership challenged the concept of public space by envisioning "flexible outdoor spaces," which would be governed and co-financed by a range of sources through the OSA (Sidewalk Toronto 2019, Vol. 2, 123). In this model, local businesses would help maintain the outdoor spaces in Sidewalk Toronto in exchange for potential opportunities.

Redefining public spaces as "flexible outdoor spaces" would also help reduce the need for municipal services in the smart city (Sidewalk Toronto 2019, Vol. 2, 186). The OSA would oversee the gardens and maintenance in Sidewalk Toronto through an interactive digital map, algorithms, and the help of volunteers. Sidewalk Labs partnered with two Canadian nonprofit organizations to develop a prototype of the CommonSpace app, through which residents could report problems and submit maintenance requests to the company (Sidewalk Toronto 2019, Vol. 2, 184).

The partnership argued that the OSA would fix the problem of intersecting responsibilities, which results in public spaces not being properly cared for. Some municipal services, such as the parks and recreation departments, could be eliminated altogether. Data modeling and residents reporting problems through the app would help Sidewalk Labs plan for when additional help is needed and hire temporary workers. Another app would contain the information needed to tend to the trees and plants in the city's green zones, which could be done by people without specialized knowledge:

> This app could use image recognition to help identify plants as well as pest and disease issues, making it easier for people to keep the garden in a state of good repair without specialized landscaping knowledge. The OSA could agree to instruct their maintenance workers to use the app as part of a pilot. (Sidewalk Toronto 2019, Vol. 2, 191)

Traffic management was another important part of the partnership's plan to modernize the city (Sidewalk Toronto 2019, Vol. 2, Ch. 1, 5). As a general principle,

Sidewalk Toronto aimed to limit the use of private cars in the smart city. Each residential area would offer the necessary infrastructure at a walkable distance; for all other purposes, residents would be encouraged to use self-driving shuttles set to replace public transit. Just like ride-hailing services, the shuttles would be available on demand and transport residents directly to where they need to be. The partnership envisioned the digital mobility system as a core component of the smart city, on top of which all other services and products could be developed. Additionally, the company requested $1.2 billion in public funding to build a light rail transit line in Sidewalk Toronto.

In the proposal, the City of Toronto's approach to transportation management was called "piecemeal," pointing to the fact that different departments oversee parking, traffic lights, and transit fees. The proposed Waterfront Transportation Management Association (WTMA) would coordinate all transportation systems in the smart city and employ data about residents' movements to use the roads and highways more efficiently: "a new public entity tasked with coordinating the entire mobility network – can manage traffic congestion at the curb by using real-time space allocation and pricing to encourage people to choose alternative modes at busy times" (Sidewalk Toronto 2019, Vol. 2, 367).

Reacting to the idea of a new transportation authority, City Councilor Gord Perks pointed to the fact that the new governance entity would erode citizens' rights by relieving elected officials of decisions regarding the transportation needs of the city. He stated: "Over my dead body. Accountability to the public is greatly harmed [. . .] This would further cement that distance between people that elect governments and the decisions that they make" (Spurr 2019). The proposed governance entity faced a lukewarm reception in the local press for the lack of public oversight:

> The proposed WTMA illustrates the point: within the Sidewalk development zones, this body would take over management of traffic, signals, curbsides, price-setting for rides and parking, mobility subscriptions, technology procurement, the operation of Sidewalk's "dynamic pavement" and flexible streets, and coordination with companies providing navigation apps. Financed by fees generated by these activities on a cost-recovery basis, the WTMA would report to the proposed public administrator, which, Sidewalk officials say, may or may not be Waterfront Toronto. Where the public connects to this formidable entity is anybody's guess. (Lorinc 2019)

The Public Administrator (PA) was the fifth governance entity proposed by Sidewalk Toronto. The PA was expected to become key intermediary between the company and state regulators. When announcing the deal, Alphabet chairman Eric Schmidt mentioned that that a project of the scale of Sidewalk Toronto may need "substantial forbearances from existing laws and regulations" (Hook 2017). For instance, the legislation may need to be revised to allow private companies access to the public facilities required to build the physical infrastructure of the smart city; with the

outcome-based code in place, Sidewalk Labs would need to communicate regularly with Canadian environmental agencies. The PA was designed to help update Canada's legislation in response to the demands of the project (Sidewalk Toronto 2019, Vol. 3, 70).

The PA idea was met with skepticism from local public officials. In his open letter to the trustees of Waterfront Toronto, Brian Beamish, the Information and Privacy Commissioner of Ontario, expressed concerns about the PA delivering key public services that fall within the mandate of the City of Toronto while not being subject to the same access to information and privacy legislation (Information and Privacy Commissioner of Ontario 2019).

Members of the public were highly expressive in their criticism of the Public Administrator concept. Bianca Wylie said in an interview with *Toronto Star* that there were no reasons to make Sidewalk Labs a broker between the citizens and elected officials: "At what cost and for what reason is a corporation becoming a broker between people and their governments in terms of designing how we live?" (Rider 2019). Similarly, Pamela Robinson, Canadian urban planning scholar and advisor to Waterfront Toronto, argued that, in Sidewalk Toronto, more robust government oversight was needed to make sure that companies' financial interests did not override the public interest (Robinson 2019).

It would be fair to say that the Sidewalk Toronto partnership failed to engage meaningfully with the citizens and local authorities in Canada. Many critics of the project pointed to the lack of clarity about the mandate of the new governing entities and argued that the company aimed to privatize the entire city governance. Several of my respondents argued that the three levels of government simply did not have in-house experts to properly evaluate the project. In 2019, the Canadian Civil Liberties Association (CCLA) sued the three levels of government over the deal with Sidewalk Labs.

CONCLUSION

In this chapter, I have drawn on the GKC framework to analyze Sidewalk Labs' proposal for the automated planning and collective governance of the smart city assets. My key argument in this chapter is that, without both the public space and the public, no collective action is possible in the smart city. Attractive as a concept, in practice the outcome-based code would erode the city fabric and destroy horizontal ties between the citizens. The partnership's vision of the commons was similarly deficient. As the Sidewalk Toronto case demonstrates vividly, the trusts become useless when imbued with the mutually exclusive goals of profiting from the city's resources and protecting the public interest.

Because of the complex socio-material and legal nature of smart cities, their infrastructure is often controlled by multiple stakeholders. The idea to govern these assets collectively has enormous potential, yet the way Sidewalk's five new governing

bodies were designed would have precluded the citizens from having any meaning representation. Both the outcome-based planning and collective governance in this project were intended to serve the commercial interests of Alphabet/Sidewalk Labs.

Canada has a recent history of failed or contested public–private partnerships, where critics pointed to the lack of transparency regarding the financial interests of the parties – e.g., the Superclusters Initiative and several projects that failed to make high-speed internet available in the remote and rural areas (Valverde and Flynn 2020). Citizens who had organized against Sidewalk Toronto would continuously invoke Canada's historic commitment to the welfare state and its strong government oversight in business operations. The #BlockSidewalk citizen group repeatedly questioned the mandate of Waterfront Toronto to represent the Canadian government in the project. Bianca Wyllie argued that the three levels of Canadian government were tragically unprepared to deal with the technology company that had designed smart city policies for its financial gain (Wylie 2020). In 2021, the federal government started appointing Chief Data Officers across its departments. Statistics Canada runs workshops on data stewardship for Canadian public officials.

After the smart city project in Toronto was canceled in 2020, Sidewalk Labs partnered with Kansas City and the City of Portland to trial Replica, the data-driven tool formerly known as the outcome-based code (Bowden 2018). One year later, both municipalities rejected Replica, reportedly over privacy and transparency issues (Coulter 2021). However, startup Replica has raised $41 million in Silicon Valley, and allegedly plans to sell its product in Europe and Asia (Wolpow 2021). The idea of data stewardship through trusts is being implemented as part of the European Union's AI governance framework (Artyushina 2021).

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