



LESLIE K. JOHN
MITCHELL WEISS
JULIA KELLEY

Sidewalk Labs: Privacy in a City Built from the Internet Up

The greatest danger to preventing the transformation of cities is the issue of data and privacy. Ubiquitous connectivity is at the center of this opportunity, because how you harvest that data – while protecting people’s privacy – is ultimately the key to the system, right? Currently, we do not have a set of agreed-upon principles or protocols to manage this issue.

– Dan Doctoroff, Sidewalk Labs CEO¹

By the time Dan Doctoroff, CEO of Sidewalk Labs, began hosting a Reddit “Ask Me Anything” (AMA) session in January 2018, he had only nine months remaining to convince the people of Toronto, their government representatives, and presumably his parent company, Alphabet Inc., that Sidewalk Labs’ plan to construct “the first truly 21st-century city”² on the Canadian city’s waterfront was a sound one. Along with much excitement and optimism, strains of concern had emerged since Doctoroff and partners had first announced their intentions for a city “built from the internet up” in Toronto’s Quayside district.³ As Doctoroff prepared for yet another milestone in a year of planning and community engagement, it was almost certain that of the many questions headed his way, digital privacy would be among them.

Sidewalk Labs first publicized its intentions for the 12-acre parcel in Toronto in October 2017. Sidewalk Labs had been founded by Google (now Alphabet) and Doctoroff two years earlier, and the company had dozens of employees, based mostly in New York City. Via a new partnership called Sidewalk Toronto, Sidewalk Labs and Waterfront Toronto, a publicly funded corporation tasked with developing the city’s eastern waterfront, would have one year to come to an agreement on a master plan. If successful, Sidewalk Labs could expand the model across more of the waterfront area, perhaps to more than 800 acres, and help make Toronto a global hub of urban innovation. As Doctoroff put it, “We have an opportunity to fundamentally redefine what urban life can actually be.”⁴ If there was no agreement, either partner could walk away.

As Sidewalk Labs fleshed out a vision for a more sustainable, more affordable neighborhood that would use data to improve city services, the team hoped to hear and address public concerns.⁵ Doctoroff began his AMA session: “Hi, I’m Dan Doctoroff, CEO of Sidewalk Labs. Ask me anything

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about Sidewalk Toronto.”⁶ A user obliged: “What do you envision being the largest privacy issues regarding this project and how does Sidewalk Labs plan to balance privacy with the effective implementation of all the ideas/goals in this project?”⁷

An Urban Innovation Company

Sidewalk Labs

Google’s leadership and Doctoroff introduced Sidewalk Labs in June 2015 as an urban innovation company. It would aim to use technology to improve modern city life. A *New York Times* article announcing its creation used the headline “Sidewalk Labs, a Start-Up Created by Google, Has Bold Aims to Improve City Living” and went on to say, of the giant company’s broadening reach beyond its digital origins and into physical objects, “Now Google is getting into the ultimate manifestation of the messy real world: cities.”⁸

Sidewalk Labs’ ambitions generated global attention as Doctoroff and Google CEO Larry Page began to spell them out. Doctoroff explained, “At a time when the concerns about urban equity, costs, health, and the environment are intensifying, unprecedented technological change is going to enable cities to be more efficient, responsive, flexible and resilient.”⁹ Page called the investment in Sidewalk Labs a long-term bet: “While this is a relatively modest investment and very different from Google’s core business, it’s an area where I hope we can really improve people’s lives.”¹⁰ (At the time, Google and Doctoroff declined to say how much Google planned to invest.)¹¹

Sidewalk Labs’ first step toward this ambition was an acquisition that would foreshadow at least some of the issues that would later arise in Toronto. Sidewalk Labs first invested in two companies, merged together as Intersection, that were developing a project called LinkNYC in New York City. With Sidewalk Labs’ guidance, Intersection coordinated the placement of slim, nine-foot-tall Wi-Fi kiosks around New York City, beginning in July 2016. The kiosks provided high-speed Internet access, device charging, and a built-in tablet for access to maps and city services – all free of charge.¹² Doctoroff noted, “The service, which is expensive to roll out, will be paid for through digital advertising on the large hub displays. We saw this as an interesting business proposition that would allow New York City to provide an incredible public service and reduce the city’s digital divide.”¹³

Initial response to the kiosks ran the spectrum from enthusiasm to concern, including over privacy and data governance. “Whoever thought of this was a great person,” one resident said, adding, “I told a homeless lady that whenever you need to call your family, you can use this.”¹⁴ Another felt differently, saying, “For some reason, I don’t trust it. They are trying to get everyone’s information.”¹⁵ *The New York Times* reported that a “Mr. Padilla, 60,” explained that “his primary concern was ‘having to give them information,’ not that he was certain who ‘they’ were.”¹⁶ Civil liberties advocates pushed the city to change LinkNYC’s original privacy policy, “arguing that it allows the system’s operators to collect all sorts of data about users and sell it to other companies.”¹⁷ It allowed for “LinkNYC to store personal browser history, time spent on a particular website, and lacked clarity about how LinkNYC would handle government demands for user data,” the Electronic Frontier Foundation warned.¹⁸ LinkNYC’s general manager insisted, “We know way less about you than your mobile phone provider does,” noted that LinkNYC was prevented from sending ads to users’ phones anyway, and indicated, “We don’t have plans to collect any additional data in the future.”¹⁹

The consortium that administered the network updated the privacy policy in the spring of 2017, limiting the amount of time that user data could be retained and promising not to track browsing histories for users on their own devices, though privacy advocates still pushed for more changes.²⁰

Intersection raised \$150 million in November 2017 to expand its services to a number of other U.S. cities, including Chicago, Charlotte, Philadelphia, and Seattle.²¹

Doctoroff had predicted back in June of 2015 that Sidewalk Labs would “evolve” from its early days and early work with Intersection, and it did.²² The company began incubating other startups that were in line with its mission of using technology to improve cities. Its spinoff Coord developed a smart route planner that integrated data from traditional public transit services and from newer ride hailing and bike sharing services.²³ While this service was accessible to the public, Coord billed its product as a developer platform.²⁴ One writer explained:

For a price, Coord will give the software developers at [transportation-adjacent] companies access to thorough local, standardized data on things like tolls, parking, and curb space. Critically, info can be shared across cities, instead of siloed in provincial departments. . . . A bike-sharing company using Coord, for example, could see its service offered alongside other transportation options within a navigation app like Google Maps: A user could locate a bike, evaluate its cost against competitors’, and buy a ride, all without breaking out a credit card.²⁵

In October 2017, Sidewalk Labs spearheaded the launch of Cityblock Health, a startup dedicated to improving health care in low-income urban communities, starting with New York City. To coordinate health services for Medicaid and Medicare recipients, Cityblock planned to create Neighborhood Health Hubs where community members could connect in-person with health care providers and other community health organizations, and would also create a technology platform called Commons to connect clinicians and care providers.²⁶ Cityblock raised \$20 million in January 2018 from Sidewalk Labs and outside venture investors.²⁷

Sidewalk Labs also began looking for cities willing to let it develop or redevelop land to serve as a testing ground for some of its new technologies.²⁸ “What would you do if you could actually create a city from scratch?” Doctoroff wondered during a speech at New York University in April 2016.²⁹ Rumors emerged that Sidewalk Labs had hired consultants to explore that very question.³⁰ And Doctoroff even mused on such a city’s virtues as a test bed for solutions to cybersecurity and privacy issues: “If you could create a place, it’d be a laboratory to experiment with these problems.”

By May of 2017, reports indicated that Alphabet and Sidewalk Labs had their eyes on Toronto as such a place. “Larry Page’s dream of using technology to fix cities,” one reporter speculated, “may come to Canada first.”³¹

Revitalizing Toronto’s Eastern Waterfront

In 2017, the city of Toronto, located along Lake Ontario, spanned approximately 630 square kilometers (243 square miles, or 156,000 acres) and was home to 2.93 million people.³² Toronto was Canada’s largest city and overtook Chicago in 2013 to become the fourth-largest city in North America.³³ Toronto’s growth was due in part to a flourishing technology industry, with one report estimating that from 2015 to 2016, the city had added more than 22,500 technology jobs.³⁴

As Toronto’s population grew, policymakers focused on underdeveloped land along Lake Ontario, beginning in 2000 with a report concluding that the “revitalization of Toronto’s waterfront . . . will have a major, positive economic impact on the City, the region and the country.”³⁵ In 2001, the local government established Waterfront Toronto, a government-funded nonprofit tasked with developing the area, including Quayside. Located adjacent to Toronto’s business district, Quayside was a mix of

empty lots, empty industrial buildings, and parking lots (see **Exhibit 1** for a photograph of the area that Waterfront Toronto planned to develop).³⁶

To facilitate Quayside's development, in 2017, Waterfront Toronto issued a request for proposals (RFP) seeking an innovation and funding partner to "help create and fund a globally-significant community that will showcase advanced technologies, building materials, sustainable practices and innovative business models that demonstrate pragmatic solutions toward climate positive urban development."³⁷ Will Fleissig, Waterfront Toronto's CEO, who would later face as many early questions as Doctoroff, said of the RFP, "We can now take bigger ideas and aspirations and say, we don't really know what the most innovative and best building technology might be, let's get the private sector involved earlier, let's think it through together."³⁸

The RFP delineated three objectives for Quayside: 1) Sustainability, Resilience and Urban Innovation (i.e., minimizing carbon emissions and otherwise being environmentally sustainable); 2) Complete Communities (i.e., affordable housing, transit, amenities, etc.); and 3) Economic Development and Prosperity (i.e., creating jobs and attracting talent).³⁹

Sidewalk Toronto

Sidewalk Labs' enthusiasm for building a city from scratch and Waterfront Toronto's vision for Quayside (and the larger waterfront district) came together in the October 2017 announcement that the company had won the RFP competition. Prime Minister Justin Trudeau attended and declared, "This will create a test bed for new technologies in Quayside. Technologies that will help us build smarter, greener, more inclusive cities which we hope to see scale across Toronto's eastern waterfront and eventually in other parts of Canada and around the world."⁴⁰ Ontario's Premier Kathleen Wynne promised the development would not be just another technology park.⁴¹ Toronto Mayor John Tory celebrated the chance for companies to tackle city problems, including housing affordability and mobility.⁴² Eric Schmidt, Alphabet's executive chairman, said, "This is the culmination on our side of almost 10 years of thinking about how technology could improve the quality of people's lives . . . whether it's inequality and access and opportunity and entrepreneurship."⁴³

All the enthusiasm might have contributed to a misconception that Quayside's development was secured or that the exact roles of Waterfront Toronto or Sidewalk Toronto (the entity Sidewalk Labs created to partner on the project) had been sorted out. What the two parties had actually signed was only a Framework Agreement, which committed them, over the next year, to jointly developing a plan to guide innovative development for the district after that. Sidewalk Labs promised to put \$50 million toward that work. (For their part, several months prior, "the federal, provincial, and municipal governments announced a CAN\$1.25 billion flood protection and waterfront revitalization investment in the same area.")⁴⁴ The Framework Agreement defined key milestones in what would be a year-long process to bring Quayside's planning to life (see **Exhibit 2**).

A Plan Development Agreement was slated to be the next concrete step to come out of Sidewalk Toronto and Waterfront Toronto's conversation with Torontonians. It would be a blueprint for a longer Master Innovation and Development Plan (MIDP), a "comprehensive plan for the urban design, technology, infrastructure, and strategies needed to achieve the parties' vision."⁴⁵ They hoped to finish the MIDP within the year.

The Framework Agreement made no mention of data, but also made no mention of how Sidewalk Labs might otherwise earn revenue from such a development, if it came to be. In the absence of specifics, speculation about Sidewalk Labs' business model brewed. Some of the ambiguity seemed

intentional, in service of letting Torontonians weigh in on how this future part of their city should unfold. The launch video shared by Sidewalk Toronto closed on the text, “The neighbourhood of the future starts with your ideas. Join the conversation today.”⁴⁶

The Conversation

The partners quickly followed up the October announcement with a public meeting that provided additional clarity on the plans for Sidewalk Toronto and Quayside, but left open questions as well. In anticipation of the event, *Torontoist*, a local online newsletter, started collecting “questions we’d like Sidewalk Labs to answer,” which gave a sense of what people wanted to know, broadly, and on privacy in particular.⁴⁷ The list included the following categories: Business Model and Project Governance; Data and Data Governance; Public Process and Engagement; Inclusivity; Collaboration with Government; Openness; Privacy Law; and Hard Infrastructure.⁴⁸ Some of the key questions that touched on data, data usage, data governance, and privacy more broadly included:⁴⁹

- How should the issue of “consent” be approached in the smart city? Should individuals be treated as consumers in a free market, able to contract freely and allow their data to be used in exchange for access to the smart city?
- Who is the user that Sidewalk Labs is ultimately serving? Companies that want to learn about how people interact with physical spaces? Real estate investors? Cities?
- How will Sidewalk Labs balance the needs of those users when making decisions about development, privacy, security, access, etc.?
- Under what terms will that data be shared? For whom and for what purposes?
- Does Sidewalk Labs have the ability to access and build upon personas from Alphabet’s data stores?
- How vertically integrated with Alphabet products will this new smart city be?
- What privacy protection process will be followed to ensure data collected is anonymous, beyond commitments to Privacy by Design^a?
- Passive harvesting of people’s movement in space time as an indicator of intent doesn’t constitute engagement. What constitutes democratic participation in smart city design?
- If the data is to be “open,” what does this mean? Will all of the data be open, or will only certain data be made available through an application programming interface (API)? Who will determine what data will be shared? Will there be graduated levels of access (i.e. some data is fully open, but access to more data requires payment)?
- Will open standards be mandated?
- Will the way data is treated by algorithms be open?
- Which privacy (data protection) law will apply to the data collected, used, and disclosed under this project?

^a A set of standards to protect personal information. (See *Privacy by Design* on p. 10.)

When the public meeting came, Doctoroff and Fleissig were not asked all of these questions. But on privacy, Doctoroff did tell the 800-plus assembled:

I think this is one of the fundamental questions that we are going to have to address together. We do think the use of data can be an important aspect in improving access to services and improving quality of life, but it has to be done in a way that respects people's data, that respects people's privacy. We literally, on the day we announced this, enunciated a set of principles around privacy. The first one is that we believe in what we call "privacy by design." Because this will be a new place, we are going to have the opportunity to build privacy into the very foundations of the place and do it we think in a uniquely Canadian way. Second thing we believe is that you should never collect data for purposes other than improving quality of life. Very important. And third is, we are going to develop these privacy policies together . . . We will create new ways of looking at it that we think will be unique to this place, that will address finally the issues we all know are out there. There are cameras everywhere anyway and there is chaos out there. Together we can bring order . . . This is something that we believe is critical and over the course of the next year we will together develop a set of world leading standards for privacy in public space.⁵⁰

Fleissig did float one possibility to deal with some of the data questions: "Who controls the data and the use of the data, whether that's another entity that's not Waterfront and not Sidewalk, but maybe a group that is actually a trust for that data, that's something I think we should derive what is the right thing for Toronto and Canada."⁵¹

Doctoroff also tried to round out the vision for Sidewalk on a few other key fronts:

On his vision for Sidewalk Toronto, in one sentence: "To take truly visionary urban planning, mix it together with cutting edge technology and actually begin to bend the curve on virtually every element of quality of life."⁵²

On the most important urban challenges: "I think by far the most important issue is all about affordability . . . If we don't fundamentally address this issue, the fabric of society . . . begins to fray."⁵³

On the role of technology (and pointing to his own extensive technology background):^b "We are not a technology company. We are a company that is built to bridge the divide between the urbanists and the technologists . . . We do not believe in technology for technology's sake. It is never about the technology. It is about using the technology in smart ways."⁵⁴

On the planning process: "We are prepared to put up \$50 million over the course of the next year in this planning exercise . . . At the end of the year, if you don't like [the plan] . . . if Waterfront Toronto's board doesn't like it, if the elected officials don't like it, they can tell us to go bye . . . The only reason we would do that is because . . . as we have been studying this we have convinced ourselves that the opportunity to bend the quality of life curve is so significant."⁵⁵

On engaging other companies: "The way we have conceived of this place is almost like a district or a neighborhood as a platform. Our goal is not to do everything. In fact, the reality is that what we hope

^b Doctoroff had served as the New York Deputy Mayor for Housing and Economic Development after the September 11, 2001 terrorist attacks and as the CEO of Bloomberg LP, which he described as "New York's largest tech company." The team he had built at Sidewalk Labs also ran the policy-tech gamut.

to do is create the conditions for others to build and create on top of it What makes the smartphone truly revolutionary is the millions of people and companies who have actually created on top of it to do things that nobody ever actually imagined were possible.”⁵⁶

On learning: “We are actually humble. We know this is not our city. We are trying really hard to learn as much as we can as quickly as we can, but you’re the experts.”⁵⁷

More on the Vision for Sidewalk Toronto

What observers could not surmise from Doctoroff’s and Fleissig’s comments at that November meeting, or from Sidewalk Labs’ many other avenues of outreach (including newsletters, emails, and small group conversations), they could look for in Sidewalk Labs’ 198-page response to the original RFP. (The actual Framework Agreement that Sidewalk had signed with the city had not been made publicly available at this point.)

In its RFP response, Sidewalk Labs proposed two initial “anchor tenants”: 1) Google’s Canadian headquarters, if Sidewalk Labs could facilitate its relocation from Kitchener-Waterloo; and 2) an Innovation Center, which would draw a variety of technology development partners to Quayside.

Sidewalk Labs proposed two basic components, or “layers,” for Quayside: a *physical layer* (including things like buildings, infrastructure, and utilities) and a *digital layer* (including systems for data collection and analysis). The proposal imagined Quayside’s physical layer as more sustainable and adaptable than traditional city neighborhoods, while the digital layer would primarily involve data collection.⁵⁸ (See **Exhibit 3** for a representation of these layers.)

Sidewalk Labs planned to collect data in public places using a variety of sensors. Weather measurement devices such as thermometers and air quality sensors would monitor the quality of the neighborhood’s environment. Audio sensors would pick up noise generated by vehicles and human activity. Sensors in buildings would monitor energy use in aggregate. Citizens could have something like a Quayside app on their phones which, when enabled, could feed their physical location data into the real-time database. High-resolution cameras would capture millions of pixels each second, creating a real-time feed of, for example, the flow of vehicles and the state of the urban environment.⁵⁹

The entire Quayside neighborhood would be equipped with wired and wireless connectivity so that data could be easily and securely transmitted.⁶⁰ Anonymized data would flow into a real-time database where data modelling tools would use accumulated data to build predictive models to optimize city functioning. The digital layer could also output data – from various stages of processing and in varying degrees of granularity – to citizens, city governance, and third-party application developers.

The digital layer would work in concert with the physical layer to deliver innovations in buildings, mobility, community and city services, and sustainability.

Buildings Sidewalk Labs proposed to build Quayside using new construction techniques and new materials.⁶¹ The buildings in Quayside would be modular, meaning that their purpose could be changed quickly and easily as needed; for example, a residential structure could be reconfigured to house retail stores.⁶² Doctoroff noted:

Why do we have zoning laws? Because there are uses of buildings that are incompatible with other uses of buildings. We don’t typically put factories next to schools, and, for the most part, we don’t put residences next to commercial buildings. There is little transparency about what is going on inside these buildings, so we classify them crudely Now imagine the digital networked age where technologies such as sensors

and social networks help us better understand what's going on. Cities can say, "You can do whatever you want in that building as long as your decibel level doesn't go above X, and we'll be monitoring it." The ability to change uses and space quickly becomes possible, enabling the emergence of a whole set of new industries around flexible buildings that can be monitored, lowering cost and creating economic growth.⁶³

Mobility Quayside's street system would prioritize pedestrians, cyclists, and self-driving shuttles.⁶⁴ For trips beyond the immediate Quayside area, inhabitants would use public transportation, ride-sharing services (e.g., Uber Pool or Lyft Line), or shared electric vehicles (e.g., Zipcar).⁶⁵ Looking ahead further, Quayside's inhabitants and visitors might get around using self-driving boats or a skyway system that used self-driving gondolas or pods.⁶⁶ Doctoroff noted:

At Sidewalk Labs, we've actually modeled an all-autonomous environment, and we expect that an average family would spend about half as much money on transportation as it does today. And putting \$5,000 back into the pocket of a family could be the difference between struggling to get by and being able to afford things that seem out of reach today. However, it isn't just about money. AV [autonomous vehicle]-only environments will be safer, meaning the time-starved parent can feel confident allowing her child to get home from school safely, potentially saving precious time. We will also be able to save on space. Parking and separated roadways take up 30 percent of a city's available land, but we think we can dramatically reduce that, creating more open space and, ultimately, improving health outcomes.⁶⁷

One of Sidewalk Labs' portfolio companies, Flow, could use location-based data from vehicles and pedestrians to predict future traffic flows and suggest ways to optimize citywide transportation.⁶⁸ Doctoroff explained that Flow fed data "into a platform that will give both the public and private parties and government the capacity to actually understand the data in ways they haven't before."⁶⁹ Flow would also improve parking by using cameras on Google's Street View cars and data from parking meters to inform local drivers of open spaces.⁷⁰ If someone traveled to Quayside, Flow could predict transit time and costs (e.g., tolls and parking) for different transportation options.⁷¹

Community and city services In Quayside, citizens could have their own digital accounts. Upon logging in to an online portal, they would be able to access information on public services most relevant to them. In turn, citizens could also use the portal to provide input to the city. For example, if a neighbor wanted to obtain a permit for a block party, the portal would enable others who lived on the block to vote on whether to approve or deny the permit.⁷²

Sidewalk Labs also proposed to create a Smart Chute system that optimized trash disposal. Using data from cameras recording trash bins, the system could anticipate when trash bins were likely to be full and deploy robotic trash collection vehicles at opportune times.⁷³ Similar to systems already launched in other cities, the Smart Chute system would be Pay-As-You-Throw (PAYT), meaning that residents would be charged based on the number of bags they threw away. In the future, Quayside's Smart Chute system might be able to automatically sort recyclables by type.⁷⁴

Sustainability Sidewalk Labs planned to build Quayside in accordance with the Passive House standard, a set of voluntary environmental building regulations most commonly used in Europe.⁷⁵ Buildings constructed according to the Passive House standard had to maintain "thermal comfort" (i.e., interiors must be kept at a comfortable temperature) while keeping energy usage for heating, cooling, and other household appliances beneath a certain threshold, a feat typically achieved through airtight building design and insulation.⁷⁶

Quayside's central heating and cooling system would derive energy from multiple sources, such as geothermal heat and deep lake cooling, and provide heating and cooling to the entire neighborhood.⁷⁷ The neighborhood would also have extendable awnings to protect pedestrians from rain or excessive heat.⁷⁸

All of Sidewalk Labs' proposed ideas had their own audacious potential to "bend the curve on . . . quality of life metrics,"⁷⁹ as Doctoroff had envisioned, and their own privacy implications. On that front, Doctoroff had committed to only using data in ways that improved quality of life (though some wondered how that could be sorted out, exactly), to adhering to Privacy by Design, and to working out issues in concert with the people of Toronto. (See **Exhibit 4** for Sidewalk's statement on privacy.) They would have to do all of these against the backdrop of an evolving and fraught privacy landscape.

Sorting Out Privacy

Privacy Concerns

With the advent of modern information technologies that vastly expanded the ability to share, collect, and aggregate personal information, privacy had become an increasingly important issue in the 21st century. Consumer advocates raised alarm bells about firms' invasive digital practices. Consumers expressed concerns, too; public outcry followed each privacy breach *du jour*—from Target's invasive use of consumer data to target promotions,⁸⁰ to large-scale hacks such as Equifax's loss of tens of millions of consumers' data in 2017,⁸¹ to Russian operatives using social media to interfere with the 2016 U.S. presidential election.⁸² As in many other countries, Canadian consumers were increasingly concerned about their privacy. (See **Exhibit 5** for Canadians' reported privacy concerns, **Exhibits 6a** and **6b** for Canadians' reported understanding of privacy issues, and **Exhibit 7** for Canadians' privacy-related behaviors.)

Even as consumers professed concerns over privacy, their behavior often revealed a great willingness to part with their personal information and an unwillingness to protect it. In one study, for example, 97.5% of participants revealed their friends' email addresses in exchange for pizza, and 75% of participants were unwilling to trivially inconvenience themselves in order to encrypt their own personal data.⁸³ And people often made impulsive yet lasting self-disclosures—one needed to look no further than social media sites for examples. While some interpreted such behavior as indicative of apathetic attitudes toward privacy, others made sense of this apparent discrepancy by pointing out that those who were less concerned about privacy were perhaps more likely to share online, while those who were highly concerned abstained from such behavior. Indeed, one recent study suggested that some people were willing to pay a premium for privacy-preserving technologies (see **Exhibit 8, Study 1**).⁸⁴ In another study, some people were willing to pay to prevent their purchases from being tracked (a form of privacy), though their willingness depended on how they were asked (see **Exhibit 8, Study 2**).

Privacy in Cities

The privacy issues that Sidewalk Labs faced as the Quayside planning went forward were not entirely unique. Local governments around the world had struggled in recent years to determine where the line should be drawn as technological capabilities rapidly advanced. In 2015, Baltimore law enforcement faced scrutiny after news reports revealed that the city's police department had secretly tracked cell phones in connection with criminal investigations and that the U.S. federal government had used surveillance planes to monitor Baltimore during protests against police brutality.⁸⁵ In 2017,

reports revealed that the Baltimore police had used facial recognition services to identify protesters and arrest them.⁸⁶ Chicago's Array of Things initiative launched in 2016 after some controversy, and involved a sensor system that collected data on traffic, temperature, sounds, and air quality, among other data.⁸⁷ In other cases, cities' data collection was less controversial. In 2016, Boston's Vision Zero initiative published a "heat map" showing data on local traffic accidents—where they occurred and whether they involved pedestrians, bicycles, or motor vehicles—with the goal of making the city's streets safer.⁸⁸

These developments were happening outside of North America as well. In South Korea, the "smart" city of Songdo featured an extensive network of cameras, sensors, and other technological features, but the developers struggled to find people to live there.⁸⁹ In China, artificial intelligence (AI) company SenseTime, worth an estimated \$1.5 billion in the middle of 2017, sold surveillance and facial recognition services to the Chinese government; in one region, the government reportedly used facial recognition and other data tools to monitor and restrict the activities of the Uighurs, a Muslim minority group.⁹⁰

Privacy by Design

As Doctoroff had referenced, Sidewalk Labs pledged to implement "Privacy by Design," a set of aspirational standards first developed in the 1990s by Ann Cavoukian, Ontario's former privacy commissioner, to protect personal information.⁹¹ One of Privacy by Design's defining features was its proactive approach, the idea being that user privacy protections should be incorporated from the ground up—from the start of the product development process rather than as an afterthought. As a result, Privacy by Design favored measures that protected user privacy by default. (See **Exhibit 9** for Cavoukian's "Privacy by Design: The 7 Foundational Principles.")

Proponents of Privacy by Design stressed that it was in organizations' interest to implement it. Others, though lauding its general principles, questioned whether firms, on their own, had sufficient incentive to implement it.⁹² Indeed, collection of consumer data was increasingly at the core of modern business models.

Legal Frameworks

Canadian citizens were protected by two primary privacy laws, the Privacy Act and the Personal Information Protection and Electronic Documents Act (PIPEDA). Under the Privacy Act, Canadians could access and correct any personal information possessed by the national government.⁹³ Applied to Quayside, this meant that citizens would have the right to access personal data that Sidewalk Labs shared with Toronto's government, and possibly with Waterfront Toronto, given that it was funded in part by the national government.

PIPEDA required for-profit companies to obtain consumers' consent before collecting or using their personal information for commercial purposes and to obtain additional consent if they sought to use consumers' data outside of its original stated purpose.⁹⁴ Under PIPEDA, consumers also had the right to access personal information possessed by companies.⁹⁵

Canada's PIPEDA fell somewhere between the U.S.'s approach to these questions and that of the European Union (EU). (See **Exhibits 10a** and **10b** for an overview of approaches to consumer privacy in the U.S. and the EU, respectively.) The U.S. and the EU differed predominantly in the centrality of the government's role in consumer privacy. On one end of the spectrum was the U.S.'s more "laissez-faire" approach, reflecting its respect for consumers' autonomy and faith in their decision-making ability. A core tenet was that as long as consumers had sufficient information on the costs and benefits

of revealing their personal data, they would make privacy decisions that reflected their preferences and this, in turn, would motivate firms to honor those privacy preferences. By contrast, the EU's approach gave governments the authority to act on behalf of consumers to impose and enforce rules with respect to firms' handling of consumers' personal data.

Open Questions

Sidewalk Labs' privacy policy was still under development—in the absence of an overarching framework for data governance, it was hard to articulate a privacy policy with any degree of specificity. Within the Plan Development Agreement, Sidewalk Labs could define such a framework, providing the vision and strategy to guide the many tactical data decisions that would undoubtedly arise in the MIDP phase of the project. Specifically, a data governance framework might seek to address high-level questions such as: Could Sidewalk Labs be trusted to make data decisions in line with citizens' interests? How much, if any, government oversight was needed? Although the relationships between citizens, government, and Sidewalk Labs would not perfectly mirror those between consumers and businesses, it could nonetheless be informative to look at prominent marketplace approaches, beyond Canada's PIPEDA, to managing consumer data when devising the framework. (Refer to **Exhibits 10a** and **10b**.)

Which model should inspire Sidewalk Toronto's governance framework? Or should it look to other, more novel ideas for inspiration? Some privacy experts had recently introduced the intriguing, though unproven, concept of an "information fiduciary," wherein the entities entrusted with consumers' data would be obligated to treat those data respectfully, or otherwise face financial penalties (see **Exhibit 10c** for an overview). Although the concept had generated enthusiasm among policy-makers and privacy advocates, it was also vague. Putting the concept into practice would require regulators to specify what it meant to treat consumers' data respectfully, and no one knew exactly what guiding values an information fiduciary should adopt. Sidewalk Labs would have to articulate such values if it decided to take this approach.

Moving from Planning to Plans

Torontonians had mixed opinions about Sidewalk Labs' vision for their city. One early poll showed a majority of those asked felt the project would be at least as beneficial for the city, or more, as it would for the company.⁹⁶ (See **Exhibit 11** for polling data.) But others questioned the company's true intentions. Sidewalk Labs' parent company, Alphabet, had faced scrutiny in recent years over how it monitored users of its search engine and other services. For example, the company's Google Maps service automatically tracked users' location history unless users opted out.⁹⁷ A 2016 privacy policy update enabled Google to use data captured across its various services to inform advertisements on its DoubleClick advertising platform.⁹⁸ Google was sued in 2015 for scanning email messages, including messages from non-Gmail users that had been sent to Gmail accounts; in response, Google made a slight adjustment to its policy, agreeing to wait until emails were in Gmail users' inboxes before conducting advertisement-related scans.⁹⁹ In late 2017, Google was sued again by U.K. iPhone users who claimed that the company had illegally bypassed their phones' privacy settings to collect data.¹⁰⁰ Some wondered what Google's past might imply for Quayside's future, with one writer contending, "Cities are not platforms with users, nor are they businesses with shareholders."¹⁰¹

Acknowledging the complex issues of privacy that the project introduced, Doctoroff said:

We all recognize that in our private lives, we are giving out lots of data in exchange for services. Sometimes we do it knowingly, sometimes we do it tacitly. Some places make

it easier, some places make it harder, but we really haven't begun to confront the issue of data privacy in public spaces. So this integration of physical and digital [layers] resting on a foundation of data will create a debate, and that's a good thing. We've got to be able to have those conversations as a society.¹⁰²

Some citizens were convinced, or at least reassured, by such statements. Indeed, as Doctoroff began his "Ask Me Anything" session on Reddit, many of the users who posted questions also expressed optimism regarding Sidewalk Toronto. One user noted, "There is lots of excitement around this project."¹⁰³ Another said, "I'm a big fan of the concept and excited for the potential for our city" ¹⁰⁴ A third added, "I get the impression that Sidewalk Labs supports these conversations, which is refreshing :)." ¹⁰⁵

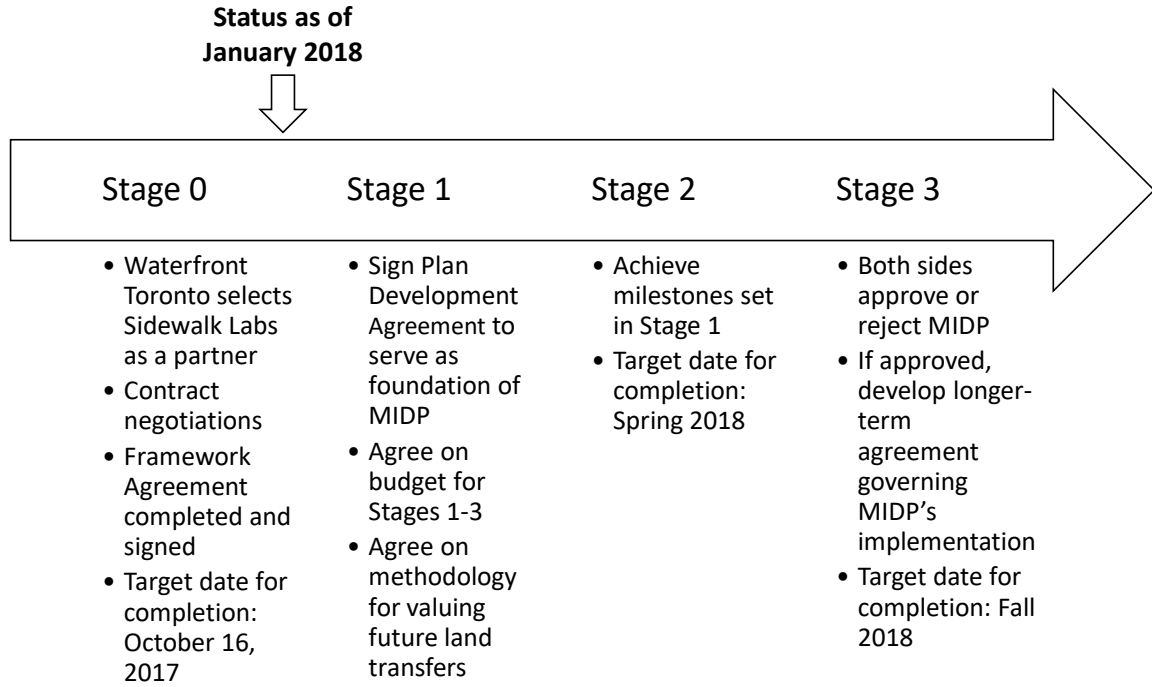
But at the same time, nearly all had come prepared with questions, and many of these questions centered on the issue of user privacy. Some were broad: "How will Sidewalk Labs ensure that its activities are transparent, accountable, and that its outcomes serve the people of Toronto – as opposed to financial interests of Alphabet/Google?" ¹⁰⁶ Others were narrower: "Is there any way people can opt out of the data collection process?" ¹⁰⁷ But they all loomed larger as Sidewalk Toronto moved from the 2017 launch toward the 2018 deadline, both for Doctoroff and the citizens he had invited to weigh in.

Exhibit 1 Toronto's Eastern Waterfront



Source: "Project Vision" section of RFP submission, Sidewalk Labs, October 27, 2017, p. 13, <https://sidewalktoronto.ca/wp-content/uploads/2018/05/Sidewalk-Labs-Vision-Sections-of-RFP-Submission.pdf>, accessed June 2018. Used with permission from Sidewalk Toronto.

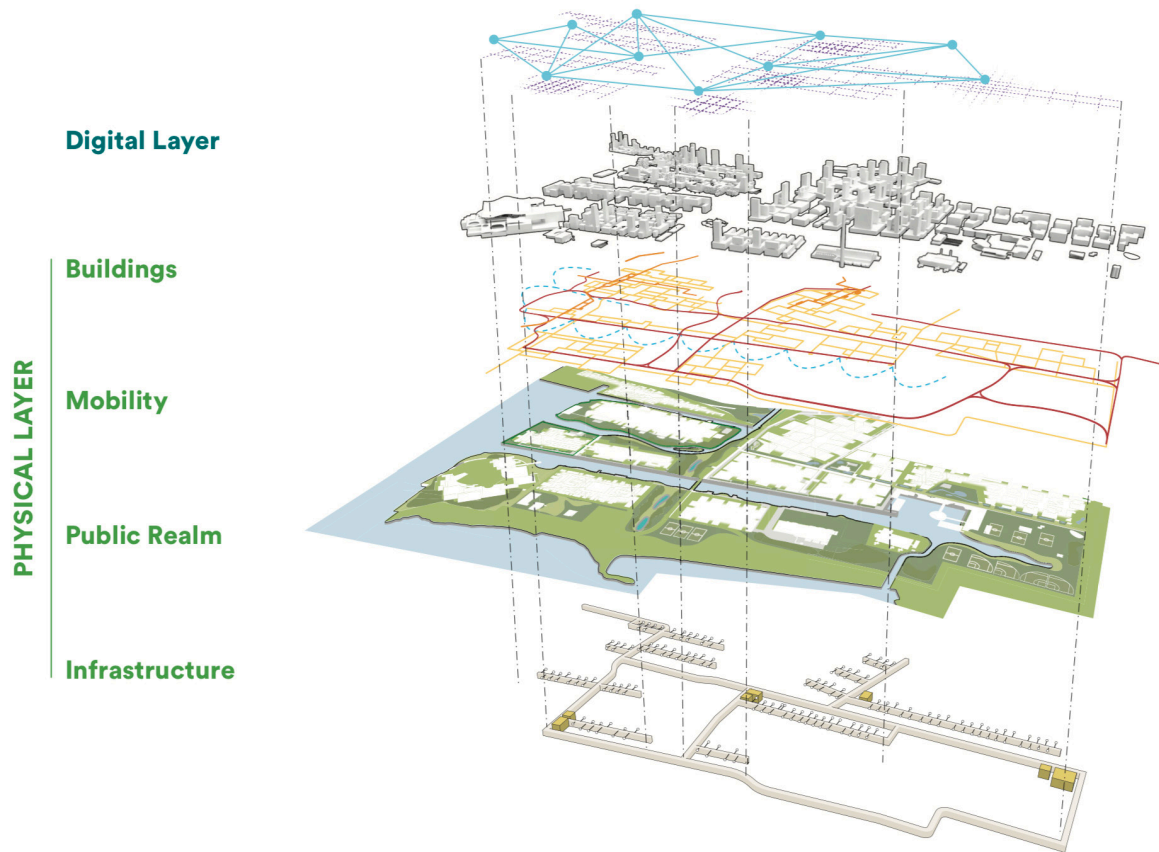
Exhibit 2 Planning Stages Outlined in Framework Agreement, November 2017



Source: Casewriters, based on information in "Innovation and Funding Partner Framework Agreement: Summary of Key Terms for Public Disclosure," Waterfront Toronto, November 1, 2017.

Note: MIDP stood for Master Innovation and Development Plan.

Exhibit 3 Two Layers for Quayside (from the Sidewalk Toronto RFP Submission)



Source: "Project Vision" section of RFP submission, Sidewalk Labs, October 17, 2017, <https://sidewalktoronto.ca/wp-content/uploads/2018/05/Sidewalk-Labs-Vision-Sections-of-RFP-Submission.pdf>, accessed September 2018. Used with permission from Sidewalk Toronto.

Exhibit 4 Sidewalk Labs Privacy Statement, October 16, 2017

Sidewalk Labs believes that a combination of cutting-edge digital technology and forward-thinking urban design can help address the major challenges of urban growth. Sidewalk Toronto, a partnership between Sidewalk Labs and Waterfront Toronto, aims to create the conditions for a global hub of urban innovation on Toronto's Eastern Waterfront, including the use of data to benefit its residents, workers, and visitors. At Sidewalk Labs, we view the protection of personal privacy as a key value in the work that we do involving the collection and use of personal information.

There is nothing new about collecting and using data to make decisions in urban environments and direct services to residents, from city planning to garbage collection to school bus routes. What is new is the ability to create a "digital layer" of technology and data to power the tools that can help communities become more affordable, inclusive, innovative, and sustainable. We see protecting privacy in the context of creating this digital layer as a key responsibility – and an opportunity.

Some of our early ideas for components of Sidewalk Toronto's digital layer include ubiquitous connectivity; sensors to understand the physical environment and how it is used; a data infrastructure that is secure, flexible, and scalable; APIs that inspire and enable a developer community to help design city improvements; and a portal of services for residents.

Sidewalk Toronto will have the opportunity to engage with community stakeholders about data privacy, devise new technical solutions to protect information, establish new models of governance and oversight, and provide greater clarity and transparency when it comes to the collection and use of personal data.

Because we will be planning the digital infrastructure of Sidewalk Toronto from scratch, we have a unique opportunity to consider privacy and security protections as we develop the technologies and how they will work in an urban environment. We intend for our learnings, products, and processes to be best-in-class case examples for urban data uses in cities around the world. Our decision-making will be informed by values of Canadian privacy and world-leading best practices. We will seize that opportunity to create a comprehensive and transparent approach to data and privacy protection, working in close consultation with the local community and independent Canadian privacy experts and advocates.

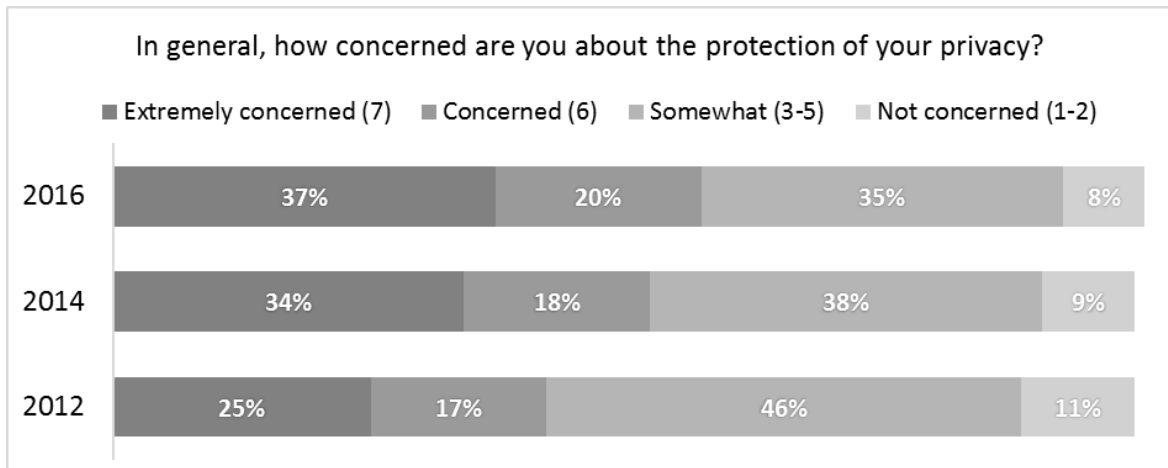
This work will begin with some core principles:

- **Privacy by design.** We will be following Privacy By Design—developed in Canada—in the design of our technologies, including empowering individuals to make choices about the use of personally identifying information.
- **Benefitting the community.** We will use data with the goal of conferring a benefit on the community—to create an urban environment that makes life there a little easier, more efficient, or more sustainable.
- **Accountability.** We will work to establish clear and consistent policies for the handling of personal information, seeking the input of members of the community in Toronto and trusted and independent Canadian experts.

We view this work as critical to the success of Sidewalk Toronto and to our mission of improving life in cities across the world. Communities don't thrive without trust—and we intend to earn yours as we plan a new community on Toronto's Eastern Waterfront.

Source: Sidewalk Labs, "Our Approach to Data Privacy," October 16, 2017, <https://sidewalktoronto.ca/wp-content/uploads/2017/10/Sidewalk-Labs-Approach-to-Privacy.pdf>, accessed June 2018. Used with permission from Sidewalk Toronto.

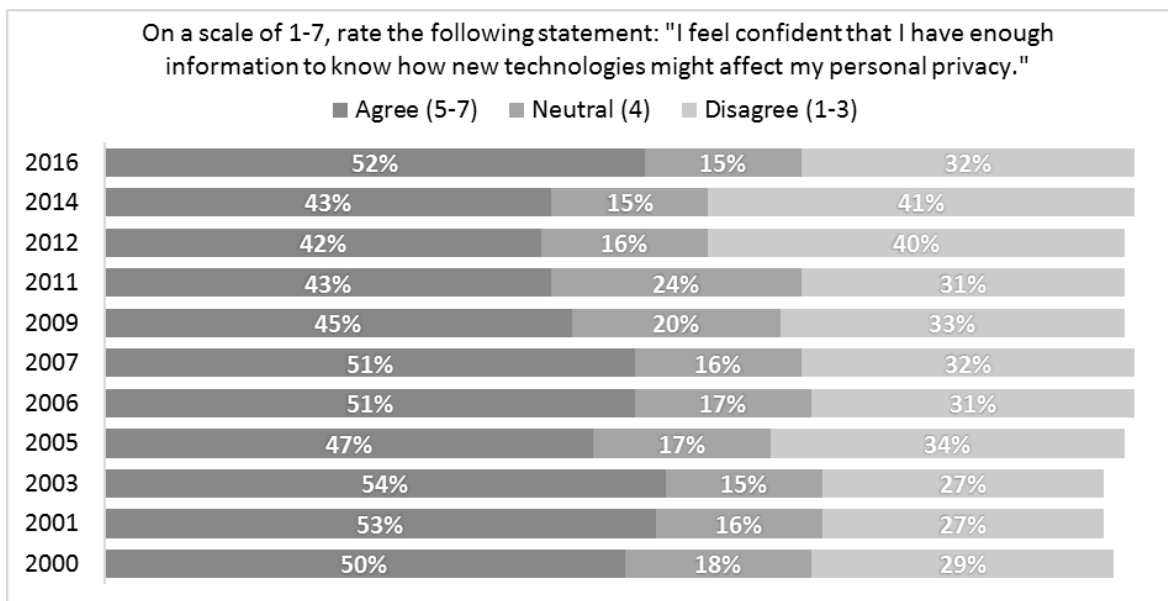
Exhibit 5 Canadians' Attitudes toward Privacy, 2016



Source: "Figure 2: Concern about protection of personal privacy," 2016 Survey of Canadians on Privacy, prepared for the Office of the Privacy Commissioner of Canada by Phoenix Strategic Perspectives Inc., December 2016, https://www.priv.gc.ca/en/opc-actions-and-decisions/research/explore-privacy-research/2016/por_2016_12/, accessed September 2018.

Note: This data was gathered by a random digit dialing telephone survey administered to 1,500 Canadians in 2016.

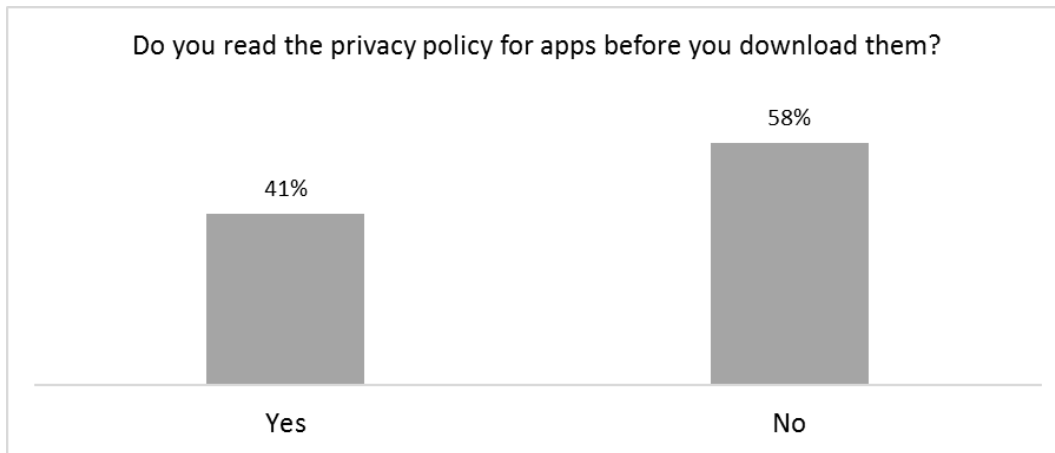
Exhibit 6a Canadians' Knowledge of Privacy Issues, 2016



Source: "Figure 3: Knowledge of how new technologies affect privacy," 2016 Survey of Canadians on Privacy, prepared for the Office of the Privacy Commissioner of Canada by Phoenix Strategic Perspectives Inc., December 2016, https://www.priv.gc.ca/en/opc-actions-and-decisions/research/explore-privacy-research/2016/por_2016_12/, accessed September 2018.

Note: This data was gathered by a random digit dialing telephone survey administered to 1,500 Canadians in 2016.

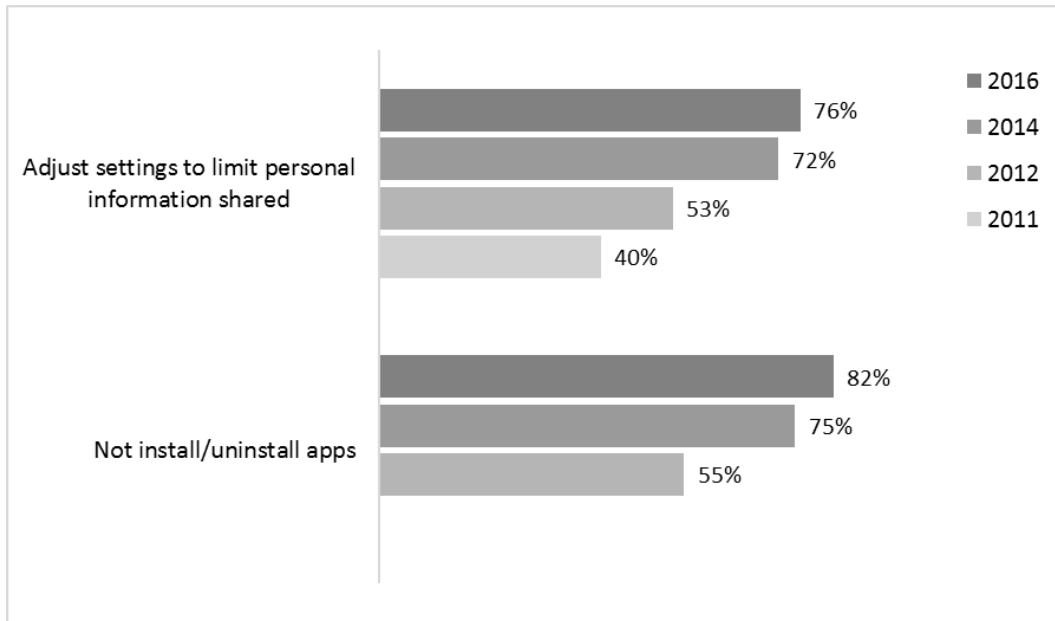
Exhibit 6b Canadians’ Knowledge of Privacy Policies for Apps, 2016



Source: “Figure 11: Privacy policies for apps,” 2016 Survey of Canadians on Privacy, prepared for the Office of the Privacy Commissioner of Canada by Phoenix Strategic Perspectives Inc., December 2016, https://www.priv.gc.ca/en/opc-actions-and-decisions/research/explore-privacy-research/2016/por_2016_12/, accessed September 2018.

Note: This data was gathered by a random digit dialing telephone survey administered to 1,500 Canadians in 2016.

Exhibit 7 Canadians’ Security Measures Taken on Mobile Devices, 2016



Source: “Figure 10: Security measures taken on mobile devices,” 2016 Survey of Canadians on Privacy, prepared for the Office of the Privacy Commissioner of Canada by Phoenix Strategic Perspectives Inc., December 2016, https://www.priv.gc.ca/en/opc-actions-and-decisions/research/explore-privacy-research/2016/por_2016_12/, accessed September 2018.

Note: This data was gathered by a random digit dialing telephone survey administered to 1,500 Canadians in 2016.

Exhibit 8 Summary of Two Studies on Consumer Willingness to Pay for Privacy Protection

Study 1

Participants were recruited to a lab at Carnegie Mellon University (Pittsburgh, PA, U.S.) and were promised a \$45 payment for participating in the study. Participants were given more than the typical payment for such a study (about \$10) because in the study they were directed to an online search engine, and instructed to search for and buy products, including batteries. When they searched for the product, a search result screen emerged, listing actual vendors and pricing. Participants then selected the vendor of their choice and were directed to that vendor’s site, where they entered their credit card information and bought the item— which the vendor, presumably, mailed to them, just as in a typical e-commerce transaction.

Unbeknownst to participants, the researchers had programmed the search engine to always produce the same result: four vendors, each of which sold the exact same product but at different prices. These vendors also varied in the extent to which their websites were secure—in other words, they varied in how protective of privacy they were. The pricing was consistent with privacy protection: the vendors with better privacy protection had higher prices.

For half of the participants, the researchers saliently displayed a “Privacy Report” in the search results, which indicated that the more expensive vendors had better privacy policies. Thus, these participants faced a clear tradeoff: they could pay for privacy by buying from the more expensive vendor. Specifically, for these participants, the search results were displayed like this:

Privacy Report	Product Name	Description	Price (w/shipping)
□□□□	Duracell Alkaline Battery, AA, 8/PK	Duracell Coppertop Alkaline AA Batteries Long-life alkaline batteries provide the best, longest power source. Recommended for use in smoke alarms, flashlights, lanterns, calculators, pagers, cameras, recorders, radios, CD players www.ccvsoftware.com/c/product.html?record@56119	\$14.45 (w/shipping)
□□□□	Duracell AA8 DURACELL - Alkaline Batteries Value Packs	Duracell AA8 DURACELL Alkaline Battery Value Packs... discountofficeitems.zoovy.com/product/DURMN15RT12Z - Privacy Policy	\$14.60 (w/shipping)
■□□□	Duracell Alkaline Battery Value Packs	Duracell AA8 DURACELL Alkaline Battery Value Packs DURACELL AA ALKALINE BATTERY - 8 PACK Cardboard card for peg hook 8 pack Specifications Weight 0.45 lbs Length 4.5 inches Width 3.75 inches Height 1 inches Manufactures Web site www.duracell.com www.instawares.com/Coppertop-Alkaline-Lithium-Bat... - Privacy Policy	\$14.80 (w/shipping)
■□□□	Duracell Coppertop Alkaline AA Batteries	Long-life alkaline batteries provide the best, longest power source. Recommended for use in smoke alarms, flashlights, lanterns, calculators, pagers, cameras, recorders, radios, CD players, medical equipment, toys and electronic games. Dependable after seven years of storage. www.officequarters.com/product.php/item/DUR-MN1500B8... - Privacy Policy	\$15.14 (w/shipping)

Exhibit 8 (continued) Summary of Two Studies on Consumer Willingness to Pay for Privacy Protection

The results, displayed below, indicate the average amount participants spent on the batteries, as a function of whether the Privacy Report was displayed or not displayed:

	No Privacy Report	Privacy Report	Premium	<i>p</i> Value*
Mean Price: Batteries	\$14.64	\$15.23	\$0.59	0.0007

*Note: The “*p* Value” column indicates whether the average price paid was statistically significantly different as a function of the provision of the Privacy Report. *P* values smaller than .05 indicate statistical significance.

Study 2

Shoppers at a shopping mall in Pittsburgh, PA, were offered one of two gift cards: a \$10 “private” card that would not track their purchases, or a \$12 card that would. Some randomly selected shoppers were given the \$12 tracked card to begin with, and asked whether they wanted to switch to the \$10 private card (switching was very easy). Other randomly selected shoppers were given the \$10 private card to begin with, and asked whether they wanted to switch to the \$12 card. The results, displayed below, indicate the proportion of people who switched cards, as a function of which card they were initially handed.

The image shows two Visa gift cards. The top card is a \$10 private card. A text box next to it says: "Given \$10 private card, but can easily switch to \$12 tracked card. Result: 48% of these people switch cards". The bottom card is a \$12 tracked card. A text box next to it says: "Given \$12 tracked card, but can easily switch to \$10 private card. Result: 10% of these people switch cards".

Source: Casewriters.

Study 1 is based on data from the research report: Janice Y. Tsai et al., “The Effect of Online Privacy Information on Purchasing Behavior: An Experimental Study,” *Information Systems Research* 22(2) (June 2011): 213–417, via Informs PubsOnLine, <https://pubsonline.informs.org/doi/10.1287/isre.1090.0260>, accessed September 2018; Study 2 is based on data from the research report: Acquisti et al., “What is Privacy Worth?” *Journal of Legal Studies* 42(2) (June 2013): 249-274, <http://www.hbs.edu/faculty/Pages/download.aspx?name=AcquistiJohnLoewenstein13.pdf>, accessed September 2018.

Exhibit 9 The 7 Foundational Principles of Privacy by Design**1. Proactive not Reactive; Preventative not Remedial**

The Privacy by Design (PbD) approach is characterized by proactive rather than reactive measures. It anticipates and prevents privacy invasive events before they happen. PbD does not wait for privacy risks to materialize, nor does it offer remedies for resolving privacy infractions once they have occurred –it aims to prevent them from occurring. In short, Privacy by Design comes before-the-fact, not after.

2. Privacy as the Default Setting

We can all be certain of one thing – the default rules! Privacy by Design seeks to deliver the maximum degree of privacy by ensuring that personal data are automatically protected in any given IT system or business practice. If an individual does nothing, their privacy still remains intact. No action is required on the part of the individual to protect their privacy – it is built into the system, by default.

3. Privacy Embedded into Design

Privacy by Design is embedded into the design and architecture of IT systems and business practices. It is not bolted on as an add-on, after the fact. The result is that privacy becomes an essential component of the core functionality being delivered. Privacy is integral to the system, without diminishing functionality.

4. Full Functionality – Positive-Sum, not Zero-Sum

Privacy by Design seeks to accommodate all legitimate interests and objectives in a positive-sum “win-win” manner, not through a dated, zero-sum approach, where unnecessary trade-offs are made. Privacy by Design avoids the pretense of false dichotomies, such as privacy vs. security, demonstrating that it is possible to have both.

5. End-to-End Security – Full Lifecycle Protection

Privacy by Design, having been embedded into the system prior to the first element of information being collected, extends securely throughout the entire lifecycle of the data involved – strong security measures are essential to privacy, from start to finish. This ensures that all data are securely retained, and then securely destroyed at the end of the process, in a timely fashion. Thus, Privacy by Design ensures cradle to grave, secure lifecycle management of information, end-to-end.

6. Visibility and Transparency – Keep it Open

Privacy by Design seeks to assure all stakeholders that whatever the business practice or technology involved, it is in fact operating according to the stated promises and objectives, subject to independent verification. Its component parts and operations remain visible and transparent, to users and providers alike. Remember, trust but verify.

7. Respect for User Privacy – Keep it User-Centric

Above all, Privacy by Design requires architects and operators to keep the interests of the individual uppermost by offering such measures as strong privacy defaults, appropriate notice, and empowering user-friendly options. Keep it user-centric.

Source: Ann Cavoukian, “Privacy by Design: The 7 Foundational Principles,” August 2009 (revised January 2011), <https://ipc.on.ca/wp-content/uploads/Resources/7foundationalprinciples.pdf>, accessed June 2018.

Exhibit 10a Brief Overview of U.S. Approach to Consumer Privacy

Consistent with its core values of freedom and autonomy, the U.S. had by and large adopted a self-regulatory approach to privacy. The Federal Trade Commission (FTC) recommended, but did not require, that firms be transparent in their approach to privacy and their data practices, and communicate to relevant stakeholders how they collected and used personal information. The FTC also recommended that firms give users control over their information—for example, by asking for their consent and giving them meaningful privacy choices. If firms did stipulate, via privacy policies, how they would use consumers' data, they were obligated to act in accordance with said self-imposed policies. Failure to do so could result in fines.

Although the U.S. did not have a federal law regulating the collection and use of personal data, there had been a growing appetite within some states for privacy regulation. In recent years, Massachusetts had passed a law requiring firms to encrypt personal data when sending it over public networks. And in California, a Consumer Privacy Act—a privacy regulation that would purportedly impose several specific rules on firms—was on the horizon; for example, businesses that sold consumers' data would have to allow users to opt out of such sales without penalty.

Source: Casewriters, compiled from the FTC, "Protecting Consumer Privacy in an Era of Rapid Change," March 2012, <https://www.ftc.gov/sites/default/files/documents/reports/federal-trade-commission-report-protecting-consumer-privacy-era-rapid-change-recommendations/120326privacyreport.pdf>, accessed June 2018; and Daisuke Wakabayashi, "California Passes Sweeping Law to Protect Online Privacy," *The New York Times*, June 28, 2018, <https://www.nytimes.com/2018/06/28/technology/california-online-privacy-law.html>, accessed September 2018.

Exhibit 10b Brief Overview of EU Approach to Consumer Privacy

In the European Union, comprehensive privacy regulation—the General Data Protection Regulation (GDPR)—was slated to take effect in May 2018. Four years in the making, the regulation would obligate firms to adhere to specific rules for collecting and managing personal data and would impose penalties for non-adherence. Fortune Global 500 companies spent roughly €6.6 billion (approximately \$7.4 billion) to prepare, estimated the International Association of Privacy Professionals and Ernst & Young.

Any company that marketed goods or services to EU residents was required to follow the regulation. Companies had to have a reason and ask permission to collect and store personal data, and were required to protect the data they collected, processed, and stored. They also had to articulate how consumers' data would be used and could not hold it longer than necessary. In the event of data breaches, the GDPR required that firms notify affected consumers. Noncompliant firms faced fines of up to €20 million (approximately \$22.4 million) or 4% of their annual revenue for the prior financial year, whichever was higher.

The GDPR gave consumers some rights and control over their personal data. In particular, individuals had the right to understand why companies were collecting their personal data and what they were using it for. It also gave consumers the "right to be forgotten," meaning that consumers could ask a firm to delete their personal information, and firms were required to comply.

Source: Casewriters, compiled from Matt Burgess, "What is GDPR? The summary guide to GDPR compliance in the UK," *Wired*, May 24, 2018, <http://www.wired.co.uk/article/what-is-gdpr-uk-eu-legislation-compliance-summary-fines-2018>; Information Commissioner's Office, "Guide to the General Data Protection Regulation," <https://ico.org.uk/for-organisations/guide-to-the-general-data-protection-regulation-gdpr/>; Nate Lord, "What is GDPR (General Data Protection Regulation)? Understanding and Complying with GDPR Data Protection Requirements," June 19, 2018, <https://digitalguardian.com/blog/what-gdpr-general-data-protection-regulation-understanding-and-complying-gdpr-data-protection>; and Mehreen Khan, "Companies Face High Cost to Meet New EU Data Protection Rules," *Financial Times*, 11/19/17, <https://www.ft.com/content/0d47ffe4-ccb6-11e7-b781-794ce08b24dc>; accessed June 2018.

Exhibit 10c Brief Overview of the Concept of an “Information Fiduciary”

To protect individual privacy rights, we’ve developed the idea of “information fiduciaries.” In the law, a fiduciary is a person or business with an obligation to act in a trustworthy manner in the interest of another. Examples are professionals and managers who handle our money or our estates. An information fiduciary is a person or business that deals not in money but in information. Doctors, lawyers, and accountants are examples; they have to keep our secrets and they can’t use the information they collect about us against our interests. Because doctors, lawyers, and accountants know so much about us, and because we have to depend on them, the law requires them to act in good faith—on pain of loss of their license to practice, and a lawsuit by their clients. The law even protects them to various degrees from being compelled to release the private information they have learned.

The information age has created new kinds of entities that have many of the trappings of fiduciaries—huge online businesses, like Facebook, Google, and Uber, that collect, analyze, and use our personal information—sometimes in our interests and sometimes not. Like older fiduciaries, these businesses have become virtually indispensable. Like older fiduciaries, these companies collect a lot of personal information that could be used to our detriment. And like older fiduciaries, these businesses enjoy a much greater ability to monitor our activities than we have to monitor theirs. As a result, many people who need these services often shrug their shoulders and decide to trust them. But the important question is whether these businesses, like older fiduciaries, have legal obligations to be trustworthy. The answer is that they should.

To deal with the new problems that digital businesses create, we need to adapt old legal ideas to create a new kind of law—one that clearly states the kinds of duties that online firms owe their end users and customers. The most basic obligation is a duty to look out for the interests of the people whose data businesses regularly harvest and profit from. At the very least, digital businesses may not act like con men—inducing trust in end users and then actively working against their interests. Google Maps shouldn’t recommend a drive past an IHOP as the “best route” on your way to a meeting from an airport simply because IHOP gave it \$20.

Source: Excerpted from Jack M. Balkin and Jonathan Zittrain, “A Grand Bargain to Make Tech Companies Trustworthy,” *The Atlantic*, October 3, 2016, <https://www.theatlantic.com/technology/archive/2016/10/information-fiduciary/502346/>, accessed September 2018.

Exhibit 11 Polling Data on Perceptions of Sidewalk Toronto, November 23, 2017

Who benefits most from Sidewalk Toronto

In your opinion, who benefits most from the development of Sidewalk Toronto, Sidewalk Labs, a subsidiary of Google, The City of Toronto, do they both benefit equally or does neither benefit?

[Base=Confidently or Somewhat confidently able to describe Sidewalk Toronto]

Age/Gender

%	Total	18-34	35-44	45-54	55-64	65+	Male	Female
Sample	219	49	36	51	40	43	120	84
Sidewalk labs	17	9	19	28	21	16	18	15
The City of Toronto	13	10	20	12	11	15	13	12
Both benefit equally	49	61	38	47	48	33	56	45
Neither benefit	10	11	13	5	12	6	7	12
Don't know	11	8	11	8	8	30	6	16

Income

%	Total	<\$20K	\$20-\$40K	\$40-\$60K	\$60-\$80K	\$80-\$100K	\$100-\$250K
Sample	219	18	30	17	23	30	48
Sidewalk labs	17	18	9	8	19	21	21
The City of Toronto	13	21	16	11	16	11	8
Both benefit equally	49	22	63	66	31	48	57
Neither benefit	10	29	6	6	24	4	0
Don't know	11	10	6	10	10	16	13

Education

%	Total	Secondary school or less	Some college or university	Completed college or university	Post graduate degree
Sample	219	33	51	71	64
Sidewalk labs	17	18	14	13	24
The City of Toronto	13	14	11	15	12
Both benefit equally	49	38	53	57	43
Neither benefit	10	20	6	6	11
Don't know	11	10	16	9	10

Source: Forum Research Inc., "Few Have Understanding of Sidewalk Toronto; Those who know it, think it benefits both Toronto and Sidewalk Labs," November 23, 2017, <http://poll.forumresearch.com/data/fa292eb0-0cc3-471f-8f10-e8fd97b93cc8Sidewalk%20labs%20.pdf>, accessed September 2018.

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