
SIDEWALK
TORONTO
FELLOWS
REPORT

TERRITORIAL ACKNOWLEDGEMENT

We begin this report by acknowledging that Toronto is built on the traditional Indigenous territory of the Huron-Wendat, Haudenosaunee, and most recently, the Mississaugas of the New Credit. This territory is part of the Dish with One Spoon Treaty, an agreement between the Anishinaabeg, Haudenosaunee, and allied nations to peaceably share and care for the resources around the Great Lakes.

While territorial acknowledgement is important, we understand that Toronto can and must do more to work towards truth and reconciliation with Indigenous peoples.

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ABOUT SIDEWALK TORONTO AND THE FELLOWSHIP

Sidewalk Toronto is a joint effort by Waterfront Toronto and Sidewalk Labs to create a new kind of mixed-use complete community on Toronto's waterfront. Sidewalk Toronto will combine new and innovative urban design and digital technology to create a people-centred neighbourhood, called Quayside

To realize this ambition, Sidewalk Toronto has embarked on a year-long process of consultation and collaboration with Torontonians, as well as leading global thinkers, that will inform and help shape the Master Innovation and Development Plan. The following report is one of the outcomes of this public engagement process.

The Fellows program was designed as an opportunity for early-career Torontonians to travel and learn about waterfront revitalization and the use of technology in North America and Europe. A full overview of the program can be found in Appendix B. The Fellows were asked to make recommendations based on their perspectives as young Torontonians interested in cities and technology.

The Fellowship was open to any Torontonian between the ages of 19 and 24 interested in the future of the city. More than 660 applications were received from young people in a variety of fields, and an adjudication panel was formed to review applications and make the final selection.

THE MEMBERS OF THE SELECTION PANEL WERE:

Pamela Robinson, MCIP, RPP, Associate Dean Graduate Studies and Strategic Initiatives in the Faculty of Community Services, and Associate Professor in the School of Urban and Regional Planning at Ryerson University;

Rhonda Moore, Policy Lead with the Public Policy Forum with responsibility for Your Energy Future fellowship program;

Anil Patel, technology for social change entrepreneur, current Ashoka and former Action Canada Fellow; and

Kristina Verner, Vice President of Innovation, Sustainability and Prosperity, Waterfront Toronto.

The panel reviewed the applications and selected a shortlist to interview on March 25 and 26.

THE 12 FELLOWS ARE:

Althea Wishloff, 23
Althea works at a seed-stage venture capital fund and has experience working on Indigenous community development projects.

Arnel Espanol, 21
Arnel is a graduate of architectural science and a designer with an interest in digital design and fabrication.

Betty Chang, 23
Betty is a researcher in public and social sector innovation who has worked with local and international health organizations.

Candice Leung, 22
Candice studied urban planning, and she promotes civic engagement and social justice through her involvement in a variety of community groups.

Carol Yeung, 21
Carol is studying engineering and has worked on a variety of technology projects. She has a passion for integrating technology into urban life.

Hana Brath, 19
Hana is studying Health Sciences and has previously studied contemporary art. She is interested in how the design of a neighbourhood can promote health in cities.

Helen Ngo, 24
Helen is a data scientist, poet, advocate for women in STEM, and a mathematics graduate.

Keisha St. Louis-McBurnie, 21
Keisha is a student in urban studies and political science and is an advocate for housing and affordability issues in Toronto.

Paul Seufert, 21
Paul studies engineering and works in management consulting. He is interested in design typologies and technological interactions.

Sachin Persaud, 23
Sachin is a graduate student in urban planning with an interest in economic development and affordability in suburban communities. He is also involved in promoting equity and tackling diversity issues at his university.

Sharly Chan, 24
Sharly is a graduate student in information studies who is interested in privacy and digital policy advocacy in Canada.

William Sutter, 24
Will is a policy analyst with experience working in various provincial government departments in the areas of social finance policy and strategic infrastructure planning.

To learn more about the Fellows, see Appendix A for full biographies. The Fellows travelled to Amsterdam, Copenhagen, Malmö, Boston, New York, and Vancouver between June and August 2018, and worked together to produce their report between August and October 2018.

ADVISORS:

The Sidewalk Fellowship Program was developed for Sidewalk Toronto by MASS LBP, with program support from Peter MacLeod, Katelynn Northam, and Adam Hasham.
Dr. Pamela Robinson, Associate Professor of Urban Planning and Associate Dean at Ryerson University, served as the fellowship's academic advisor. In this role, Dr. Robinson contributed to and reviewed the travel program and attended many of the Fellows' working sessions. For her contributions, she received a small stipend.

MASS LBP and Dr. Robinson supported and facilitated the drafting of this report and commend the Fellows for their dedication and efforts. Their involvement does not imply an endorsement of the contents of the report, and the following recommendations are the sole commentary of the Fellows themselves.

OUR OUTLOOK ON THE CITY AND THE WATERFRONT TODAY

We are millennials. We are on the cusp of becoming Canada's largest generation and electoral cohort. It is our turn to build the communities of tomorrow and set the principles that will define where Canadians call home. And yet, almost twenty years into the 21st century, the current state of Toronto politics can be summarized as follows: if it's not broken, don't fix it. And if it is broken, commission a few reports, debate the issue for years, and when it's finally time to make a bold decision, avoid it altogether and leave the problem for future generations to address.

Toronto, we love you.

This is our home. We didn't all grow up here, but it's where we have all chosen to be. The problems we face as a generation are complex and endemic. They are problems that earlier generations and governments have ignored. Commuting three hours a day with multiple transfers and fares to get to and from a first job is unacceptable. Not being able to save a cent, or think of starting a family because you struggle to pay market rent and carry enormous student debt is morally debilitating. Not being able to find a job that provides health benefits and has a pension plan is a betrayal of Canada's economic promise. Living in a community where design is often an afterthought, where energy is wasted, where the street-clogging car is still king, is discouraging. To us, the current system feels broken, and our current approach to city-building seems terribly out of date.

In Toronto, the neighbourhood in which you grew up *does* matter. Toronto's geographic divisions, amplified by gaps in transit infrastructure, affordable housing, and quality of urban design have separated people in the inner suburbs from the city's core. This sense of isolation goes beyond geography. Poverty and income inequality in Toronto are at an all-time high, with inequality between neighbourhoods increasing by 96 percent over the last 30 years.[1] As income inequality rises and access to opportunity diminishes, our collective outlook dims — 52 percent of Torontonians believe that the next generation will be worse off than the previous one.[2]

Toronto needs an attitude shift. The insular "Not-In-My-Backyard" mindset that is held by some long-time property owners needs to end. Just as you told us as kids that "we need to share," there is a subset of Torontonians that need to be told the same thing. This city is not yours alone. You need to share.

This is a divided city.

Notably, more than half of Torontonians (51.5 percent) now belong to a racialized community.[3] People around the world recognize Toronto as one of the most diverse cities in the world. We're proud of that, but sometimes it feels like a marketing facade. In actuality, many of our "diverse" neighbourhoods are racially segregated.[4] In the downtown core, well-off neighbourhoods are predominantly white; just look at Toronto's top-ranked neighbourhoods.[5] Diversity is a fact. Inclusiveness is a choice. It's time to stop patting ourselves on the back for being diverse and to continue the hard work of being *inclusive*.

The Greater Toronto and Hamilton Area's diversity, top-ranked colleges and universities, and leading research in artificial intelligence have garnered the world's attention. A world-class technology cluster is taking shape around us. Bloomberg LP cited Toronto as the fastest growing tech job-market in 2017, noting that we created more jobs in the technology industry

than San Francisco, Seattle, and Washington, DC, *combined*.[6] While we're excited for opportunities to leverage this technology in how we build our cities and deliver public services, we're cautious. In the midst of this economic growth, average wages have remained stagnant despite dramatic rises in cost of living.[7] What does this mean for the future of work in Toronto?

And what about the lake?

John W. Campbell, founding CEO of Waterfront Toronto, once said that "Toronto is a city with its back to the water."[8] How have we managed to ignore one of the city's most defining features for so long? The Gardiner Expressway is a physical and psychological barrier along the waterfront, airplanes landing into Billy Bishop Airport disturb proximal neighbourhoods, and luxury condominiums have created a glass wall between the city and Lake Ontario.

That's not to say that it's all bleak. Parts of the waterfront have been revitalized for the better. The Scarborough Bluffs, Trillium Park, Sugar Beach, and the Toronto Islands are great places to spend time and enjoy the lake. Projects such as the Queens Quay streetscape redesign, including the Wavedecks and the Martin Goodman Trail, are the first steps in re-establishing Toronto's waterfront as a vibrant and livable public space.[9]

Fundamentally, this report is the culmination of the thoughts of twelve young Torontonians who travelled to six cities in North America and Europe, asked tough questions to fascinating people, and reflected carefully on Quayside's potential. Underlying these recommendations is our belief that Quayside will catalyze a new era in our city — an era of bold decision-making and a dramatic pursuit for an equitable, affordable, and innovative Toronto.

THIS REPORT IS BASED ON A SET OF PRINCIPLES AND VALUES THAT GUIDED THE RECOMMENDATIONS THAT FOLLOW:

1. Quayside should be a complete community that allows all individuals and their families to thrive. To create an **equitable, inclusive, and diverse** neighbourhood, Quayside must be a place for Toronto's marginalized and equity-seeking communities. It should be a place for learning, capacity-building, and economic opportunity, fostering improvements in the social and economic conditions associated with the social determinants of health.

2. Quayside should be a place that is created by Torontonians for Torontonians through meaningful **citizen engagement** and citizen control. It should foster what is known as **place-making** — a process that capitalizes on a local community's assets, inspiration, and potential to promote well-being.

3. Quayside should be a place with integrity and one that **fosters trust** among residents, using mechanisms necessary to ensure public and individual accountability.

4. Quayside must put **humans first**. We believe strongly in protecting the **privacy of individuals**, and are acutely aware of the need for stronger protections for **collective rights** when data is collected and anonymized on a large scale. If technology is used as a solution to a problem, it must enhance the autonomy of citizens through ethical design and governance.

5. Quayside should be a place that embodies and fosters **environmental stewardship**. It should consider the environmental impact that physical and digital infrastructure may have on achieving better climate outcomes. We believe in a circular economy, where resources are kept in use for as long as possible, extracting their maximum value, minimizing waste, emission, and energy leakages, and then recovering and regenerating products and materials at the end of each service life.

A boat turned workspace at De Ceuvel in Amsterdam

STRUCTURES AND HOUSING

Oshawa. Barrie. Hamilton. Because of a failure to manage Toronto's housing market, our generation of Torontonians must look harder and further from Toronto in order to own or rent an affordable home that suits our needs. We have been told for years that the market will correct itself. What is an entire generation to do in the meantime? How long should we put our lives on hold, patiently waiting for the invisible hand of the market to magically make everything better? Enough is enough. Waiting for the housing bubble to pop is no longer within the realm of reasonable patience — it is a categorical failure in policy, and we should hold our politicians accountable for it.

From 2005 to 2015, the cost to rent in Toronto increased by 12 percent, while median income increased by only 4.6 percent (inflation-adjusted).[10] Governments, for their part, have not made substantial investments in affordable housing for several decades. At the same time, the City of Toronto has become segregated by income and race. As explained by David Hulchanski, we live in a divided city where the number of wealthy and disadvantaged neighbourhoods continues to rise, and our middle-income neighbourhoods are disappearing. In low-income communities where the average individual income is $32,000 before taxes, 68 percent residents are visible minorities.[11]

In Toronto, nearly 47 percent of tenant households live in unaffordable housing, meaning they spend more than the benchmark of 30 percent of income on shelter costs.[12] For a city that prides itself on its inclusivity, the facts presented suggest that we should not pat ourselves on the back. Quayside is an opportunity to embed affordability into the ethos of a community right from day one. It also represents a testbed for policy and technological innovations in housing, land use, and energy management. If Quayside proves to be successful as an affordable place to live, work, and play, we can apply the lessons learned and use them to make improvements to infrastructure and housing across Toronto.

Recommendation 1

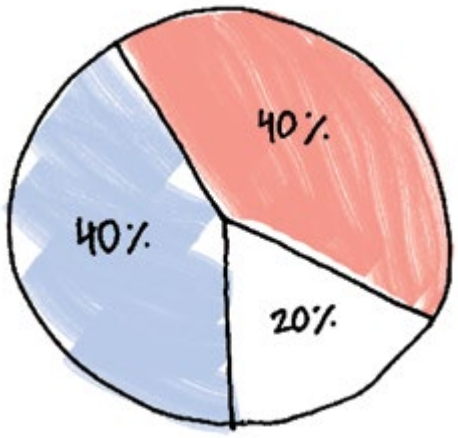
SET AMBITIOUS LOW- AND MID-RANGE AFFORDABLE HOUSING TARGETS

Quayside must include housing that is truly affordable for residents of Toronto across all levels of income. This recommendation calls upon Waterfront Toronto and the City of Toronto to leverage their ownership of public land in Quayside, adopt a firm negotiating stance with Sidewalk Labs when establishing a legal and financial agreement to set higher affordable housing targets in Quayside, and increase the mix and integration of market and non-market housing by developing an adequate supply of mid-range and social housing.

We must go beyond the 20 percent of "affordable rental housing" units Waterfront Toronto is mandated to provide, as defined in Toronto's Official Plan,[13] to create a truly accessible, equitable, and inclusive community. Here, we envision a strong role for Toronto's non-profit sector that wants to develop affordable housing but cannot afford to pay market price for land. In partnership with municipal governments, agencies, and social purpose investors who can put in land at low to no cost, we believe that our non-profit sector can create and manage a healthy and complete mixed-income community.

In this context, we recommend the following tenure breakdown for residential units in Quayside:

- 40 percent rent-geared-to-income (specifically for low- to middle-income residents, with a provision to house residents directly from the City of Toronto's centralized waitlist for subsidized housing); [14]
- 40 percent affordable rental and ownership housing (affordable rental and ownership redefined to describe housing where total monthly shelter cost is 80 percent of average market rent for the City of Toronto); and
- 20 percent market rental and ownership.



New, family-friendly condos in the Buiksloterham neighbourhood of Amsterdam

EXAMPLES

The City of Amsterdam is uniquely positioned to set ambitious affordable housing targets because the City owns and leases approximately 80% of land in Amsterdam. In 2017, the City of Amsterdam adopted a "40-40-20" housing model to substantially increase its supply of affordable housing to meet demand. As a part of its Housing Agenda 2025,the municipality will require 40 percent of new development to be social housing, 40 percent medium-rent and owner-occupied housing, and 20 percent expensive rental and owner-occupied housing. [15]

In 1977, the City of Toronto began construction on St. Lawrence — a municipally planned and developed, inner city, high density, socially mixed neighbourhood. To address fundamental justice and equity considerations, and in spite of high land values, the neighbourhood mixed housing types, sizes, and tenures ensuring long-term affordability for low- and moderate-income households. Notably, 30 percent of housing units were non-profit co-operative and private non-profit rental; 27 percent municipal non-profit, non-market rental; 39 percent condominium ownership; and 4 percent ownership townhouses. The community was completed in the late 1990s.[16]

PROVIDE AFFORDABLE HOUSING AT QUAYSIDE IN PERPETUITY

Many public affordable housing programs only require affordability for a fixed period of time. For example, in order to receive funding through the City of Toronto's Open Door Affordable Housing Program, applicants must provide affordability for 25 years — but then what happens? Once that period lapses, those units revert to market value and affordability becomes difficult to recapture. We concur with academics who argue that funds disbursed through public programs should be reserved for units that remain affordable in perpetuity, rather than kicking the affordability crisis down the road.[17]

Guaranteed affordability in perpetuity will allow households that would otherwise be priced out of an area after the affordability period had elapsed to remain, contributing to a stronger, stabler community. The benefits of providing "housing first" are well understood — residents need continuity to live healthy, happy lives. Continuous affordability also creates a more solid foundation upon which to increase housing supply, rather than always having to build new affordable units to replace the ones that have reverted to market price.

EXAMPLES

New York City's **Mandatory Inclusionary Housing (MIH)** policy contains a requirement that a portion of new residential development be made permanently affordable. Prior to adoption, a third-party financial feasibility assessment was conducted to determine how MIH would affect the feasibility of new residential development projects under a range of market conditions. In very strong and strong market conditions, multi-unit residential developments of all sizes were found to be feasible.

Western Harbour neighbourhood in Malmö, Sweden

Recommendation 3

ESTABLISH AN AFFORDABLE HOUSING FUND TO CHAMPION, FINANCE, AND OPERATE HOUSING AT QUAYSIDE

The Affordable Housing Fund (AHF) would create an ongoing funding stream dedicated solely to the construction and maintenance of affordable units. Governments should explore new and creative ways of embellishing the AHF. For example, a portion of intellectual property (IP) revenues generated at Quayside could be diverted towards the new fund. While it is not yet clear how much revenue this would create, Jim Balsillie has written that "'[s]mart cities' are the new battlefront for big tech because they serve as the most promising hotbed for additional intangible assets that hold the next trillion dollars to add to their market capitalizations."[18]

In other words, IP and data are where the money is. We believe that public sector actors should tether Toronto's affordable housing outputs to the private wealth generated from IP and data at Quayside. Each time IP rights are licensed from a Quayside-based IP owner, a portion of the royalties should be earmarked for the new affordable housing fund. If Sidewalk Labs develops a successful new autonomous vehicle (AV) prototype, our government should capture and redirect some of that value at the patent approval stage.

Another means of financing the AHF would be to divert any savings derived from construction efficiencies (e.g., as a result of tall timber and modular construction) towards the fund. Cost saving derived from affordable development and construction should be passed down to residents.

EXAMPLES

Vancouver has created an Affordable Housing Endowment Fund with a mandate to finance and deliver 72,000 affordable housing units over 10 years through partnerships. Funding will come from payments associated with the leasing of city lands, community amenity contributions, development levies, empty homes tax revenue and contributions from higher levels of government.[19]

Many US municipalities find their own ways to fund their affordable housing initiatives:

- Boston extracts a portion of collected development charges, Austin has inclusionary zoning in-lieu fees, and Portland (Oregon) diverts short-term rental tax revenues.

- In May, Seattle City Council passed a so-called "Amazon tax" to raise $50 million in additional tax revenue from companies making more than $20 million annually, based on number of employees. Barely a month later, council voted down the tax due to corporate success in turning local sentiment against the measure. The additional revenue would have been allocated towards affordable housing construction and dealing with the city's homelessness crisis.[20]

- In Mountain View, California, a referendum will be held in November on a tax measure similar to that proposed in Seattle. The measure is predicted to raise $6 million for the municipality. The mayor has identified transit, affordable housing, and homeless services as major priorities for funding.[21]

Recommendation 4

PREVENT THE "DISNEY-IFICATION" OF QUAYSIDE

Disney-ified cities aren't built for communities, they are built for tourists and real estate investors. During our trips, we observed the tension that exists between investor and community-building interests in quickly-growing cities. We witnessed first-hand the adverse effects this tension can have on sustaining livable and affordable communities. Because of the global interest surrounding this project, we need to be decisive and ensure that Quayside is a community for people to actually live in, not just invest in. To us, this means working across sectors to enact and enforce policies that prevent unnecessary exploitation of real estate by speculative investors.

Before any residential property in Quayside is sold we would like to reiterate the importance of and our support for City Council approved regulations on short term rentals. The City of Toronto should apply council-approved regulations on short-term rentals. The City should also work with organizations like Airbnb to develop new ways of enforcing regulations.

EXAMPLES

Amsterdam and Vancouver struggle with the pressures of short-term rental properties such as those offered by Airbnb. Further, we heard from locals about the overwhelming presence of large multinational retailers and gift shops that don't support the daily needs of residents and subtract from the dynamism of the streets.

While Vancouver has implemented taxation on short-term occupancy to manage housing prices and allow Vancouverites to reside within the city centre, the city continues to have some of the most "crisis-level" housing prices across the nation.

Downtown Toronto

Recommendation 5

EXPLORE THE FUTURE OF AFFORDABLE, GROUND-LEVEL RETAIL IN QUAYSIDE

Quayside deserves a retail environment that is as vibrant and diverse as Toronto itself. We envision a district where local startups, makerspaces, and small-scale artisan spaces are visible from the ground level. Sidewalk Toronto should establish a Business Improvement Area (BIA) in Quayside and work with Torontonians to define a local vision for the retail environment. This vision should become the guideline for assessing whether to grant leases as well as the basis for a dynamic leasing system that will encourage local and independent businesses to flourish.

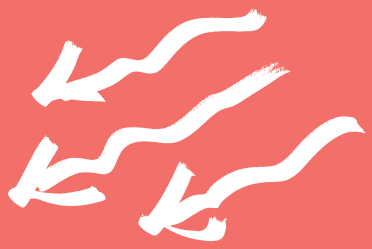
Further, there needs to be an adequate supply of micro-retail units to promote affordable space for small businesses and entrepreneurs. Sidewalk Labs should offer tools and training to businesses in the space to improve digital literacy and bolster their online presence in today's ever-evolving retail landscape.

EXAMPLES

As part of the Northeast False Creek development in Vancouver, the City is working with real estate developer, Concord Pacific Developments Inc., to integrate a unique kind of retail into the area. Instead of leaving it up to the developers to lease retail space to whomever they choose, city planners are creating "retail zones" to curate certain environments. The City aims to create a zone that fosters local business and entrepreneurship by building small commercial spaces in tight-oriented laneways — "like European-width lanes that don't take cars."[22]

Vancouver's Granville Island, managed by the Canadian Mortgage and Housing Corporation (CMHC), uses a dynamic lease rate system to foster a creative business environment. Calculated on a per square metre rate, base rents are dependent on "...a variety of factors such as use, location, and market conditions" and whether a development is "in line with Granville Island's mission."[23] This approach has led to the presence of tenants like the more-than-fifty local artists and artisans who sell goods that are produced on the premises, as well as an Arts Umbrella, a non-profit that provides dance, theatre, and visual arts educational programming for young artists.

ESTABLISH AND DEMOCRATIZE A CARBON-NEUTRAL NEIGHBOURHOOD ENERGY PUBLIC UTILITY PROGRAM



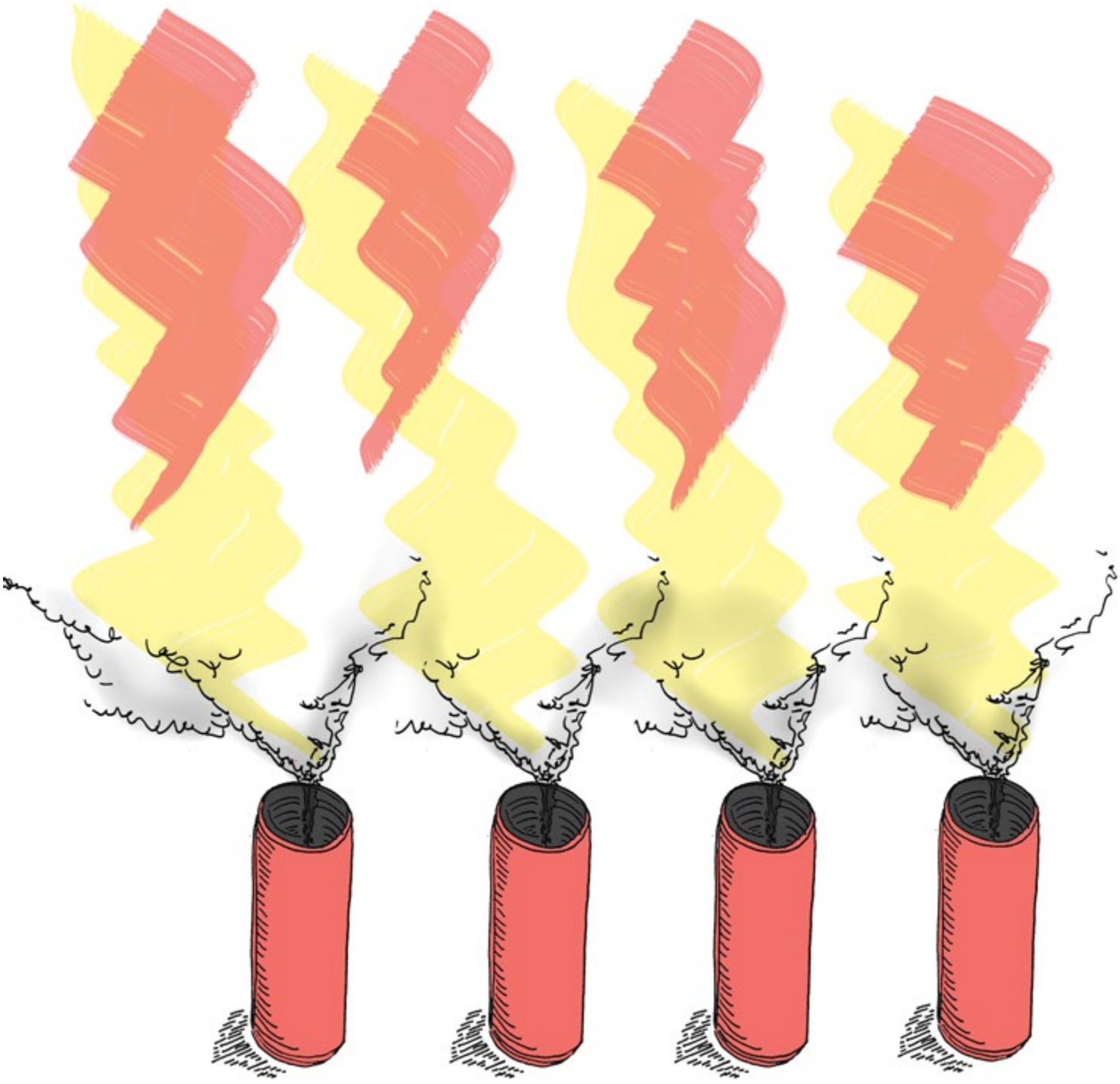
Buildings are the largest polluters in our city.[24] They consume too much electricity and produce tonnes of greenhouse gas (GHGs) emissions from the use of natural gas.[25] The main culprit of this energy consumption is the heating of our indoor air and water. The City of Toronto has only making efforts to offset energy consumption and GHG emissions by investing in systems like the Enwave deep water cooling to provide cool air to buildings like Union Station, City Hall, Old City Hall, and other buildings near them.[26] We want systems like this to service more of our neighbourhoods around the city and not only tall towers.

The City of Vancouver implemented the Southeast False Creek Neighbourhood Energy Utility (NEU) in 2010, which continues to grow and now services 484,000 square metres of residential, commercial, and institutional space.[27] The NEU is self-funded and operates by recovering heat from the city's sewage pipes and sending it back to its neighbourhoods, including Olympic Village, as heat and hot water. It can also adapt to future carbon-neutral systems, which can also stabilize energy costs for consumers compared to current non-renewable fuel prices.[28] This technology is nothing new — it is used in cities like Oslo, Norway, and Tokyo, Japan, making the Southeast False Creek NEU the first in North America.[29] Now, let's bring it to Toronto!

When public energy utilities become part of the fabric of our neighbourhoods, they should not be another eyesore. Rather, they should be integrated into our urban fabric and be interactive with local residents on a physical and digital level. We'll discuss design later in the report, but, for now, it would be worthwhile to realize that residents can potentially use digital platforms to understand and control how locally produced energy can benefit their neighbourhoods.

De Ceuvel is an innovation district in Amsterdam that relies on over 150 photovoltaic (PV) solar panels for most of its electricity needs.[30] These PV panels are installed on each houseboat studio in the district, and members share the energy they produce using a crypto-currency "token" called the *Jouliette*.[31] Members can also visualize and manage local energy production and consumption, make transactions with one another, or even trade goods at its local cafe online.

We're proposing a system that combines neighbourhood energy utilities and an energy sharing token like the *Jouliette*. Toronto's neighbourhoods can use the existing resources in our city, such as waste, sewage, or even Lake Ontario, to be self-sufficient while servicing other neighbourhoods around the city. Building a sharing platform like the *Jouliette* into a system like this can also enable Torontonians to benefit from energy that is harvested in their own neighbourhoods.



A parking lot of bicycles in Amsterdam

MOBILITY

As Torontonians hailing from across the city, we understand how the ease of a commute substantially influences the decisions we make, the opportunities we can access, and our general well-being. We want to be able to walk, cycle, or take public transit to get around, but we also know all too well the anxiety that stems from an often unreliable transit system. We know the stress of cycling on routes that don't have properly separated bike lanes. We've experienced first-hand the immense mental and physical tolls that result from travelling between suburbs and the downtown core.

At the same time, we've been enchanted by cycling experiences in cities like Amsterdam and Copenhagen, and we understand how this brings benefits to individuals and the collective city. For every kilometre travelled by bicycle instead of by car, Denmark gains approximately €1 in terms of health benefits, resulting in nearly €215 million saved each year.[32, 33] But, despite our eagerness to adapt lifestyles grounded in active transportation, many of us share horror stories about pedestrian and cycling accidents. Nearly two years after Toronto's Vision Zero was announced, our city is currently on pace for its deadliest year for pedestrians and cyclists.[34]

We believe that Quayside, and our city as a whole, should be able to support a wide variety of reliable and sufficiently scaled transit and transportation options. Moreover, we believe that these options should promote the health and well-being of residents, without compromising neighbourhood accessibility of citizens with differing mobility needs.

EXPAND THE CAPACITY OF OUR CURRENT TRANSIT NETWORK TO AND FROM QUAYSIDE

We can't successfully redevelop the Eastern Waterfront, including Quayside, without new and robust transit options to seamlessly connect different neighbourhoods and city areas. These options must adequately support projected increases in the demand of users travelling to and from the area.

Cycling or pedestrian pathways through Quayside must be better connected to existing recreational and cycling routes such as the Don Valley systems, by creating priority cycling- and pedestrian-friendly traffic lights and pathways along the lakeshore and under the Gardiner Expressway.

Regardless of whether someone travels these routes for their daily commute or for an occasional weekend visit, these pathways must be easy to find and easier to use. Quayside cannot be an enclave that stops at the Gardiner Expressway. Accessibility has to permeate throughout the neighbourhood's surroundings.

EXAMPLES

Cycling, walking, and public transit routes in Copenhagen and Amsterdam span the whole city: Amsterdam has nearly 200 additional kilometres of cycling lanes than Toronto, despite the fact that the City of Toronto is almost three times larger in size than Amsterdam.

These cities presented many opportunities for multimodal trips. For example, we travelled from Central to North Amsterdam by taking our bicycles on a city barge. In Toronto, you should be able to not only cycle across the city, but also transport your bicycle with ease by using transit options. Cyclists from Etobicoke, North York, and Scarborough should be able to connect their bicycle routes to other areas of the city by leveraging public transit. While this is currently possible on some forms of transit, it is not an option at all times of the day.

Recommendation 8

ENSURE THAT CYCLING, WALKING, AND PUBLIC TRANSIT ARE ALWAYS FASTER, MORE RELIABLE, AND MORE CONVENIENT THAN DRIVING

Cycling through North Amsterdam

The primary reason people choose to not walk, cycle, or use public transit is the lack of convenience. To significantly affect behaviour change, these options must be made more convenient. For example, in Copenhagen, where 41 percent of trips are by bike, the majority of cyclists prefer biking for speed and ease.[35]

Currently, Toronto disproportionately allocates resources towards automobile infrastructure. This is clearly visible when trying to use public transit, or when attempting to walk or cycle to 307 Lakeshore, Sidewalk Toronto's local headquarters. Plain and simple: making walking, cycling, and public transit faster and more reliable will require the dedication of a lot more resources. The City of Toronto, Waterfront Toronto, and Sidewalk Labs will need to make these infrastructure improvements a financial and time-sensitive priority.

Residents and visitors in Quayside will be more inclined to choose active transport (walking, cycling, or other physically engaging methods of transportation) or public transit if these options are made to be faster and more robust. This is better for the city in the long run, in terms of financial savings, health benefits for Torontonians, and environmental impact.

EXAMPLES

Traffic lights, stop signs, and right-of-way features favour cyclists, and reduce commute times by synchronizing to create a "wave" of green lights for cyclists in Copenhagen.

On Copenhagen roads, snow removal for cycling lanes is prioritized over snow removal from car/driving lanes.

CATALYZE ACTIVE TRANSPORTATION THROUGH BETTER DESIGN THAT PROMOTES SAFETY, COMFORT, AND DELIGHT

The Fellows in Amsterdam

People avoid active transportation in Toronto due to legitimate safety concerns. For example, pedestrians comprise 45 percent of street-related accident victims in Toronto.[36] Cycling can also be uncomfortable in terms of safety and ease, especially due to weather-related concerns during peak summer or winter seasons.

Safety features, such as raised cycling pathways, weather mitigation and prioritized snow removal, and separated pedestrian/bike lanes, could help encourage Torontonians to use active transportation more often.

Features to improve comfort and enjoyability, such as roadside handrails or footrests for cyclists, weather mitigation for additional comfort, "gamification" of a walking or cycling commute (such as Vancouver's IllumiLane bike and walk ways that integrate light-up art into journeys), and real-time, data-driven feedback for cyclists (e.g., providing cyclists with real-time route suggestions for their commute) could change behaviour around active transportation.

EXAMPLES

IlumiLane is an interactive light-up bike and walk way in Vancouver that integrates art into active transportation. It improves cyclist and pedestrian visibility while incentivizing safer cycling speeds. If cyclists ride below 20 km/h, they are rewarded with a pulse of rainbow lights ahead of them. If they ride faster than 20 km/h, the lights flash red as a warning to slow down.[37]

In Copenhagen, busy intersections have **cyclist "counters"** to inform commuters of how many people have biked that day. This real-time feedback lets cyclists know that they are part of the city's collective effort to keep the air clean, look after their personal health, and improve overall public health or environmental quality.[38]

Recommendation 10

USE QUAYSIDE TO DEMONSTRATE A REDUCED NEED FOR PRIVATE VEHICLE OWNERSHIP IN THE CITY OF TORONTO

As the convenience of public and active transportation options rises, limits on private vehicle use should also be raised. Reducing the use of private vehicles within Quayside presents more opportunities and resources for future modes of transit such as autonomous vehicles. Quayside should experiment with roads designed to accommodate AVs.

Some measures, such as dynamic congestion pricing, must be in place in order to promote active transport and public transit (as seen in Amsterdam and Copenhagen) and to improve the health and well-being of the residents of, and visitors to and from, Quayside. Traffic mitigation and reduction will improve pedestrian and cyclist safety, and promoting active transport will reduce environmental impact.

Reducing cars also means that those with mobility issues could face barriers when accessing Quayside. In line with the Ontario Disabilities Act, Toronto public transit must be barrier free by 2025. However, experts are skeptical about the feasibility of this mandate: over the past five years, TTC Wheel-Trans ridership demand has increased by more than 30 percent, while nearly half of subway stations remain inaccessible.[39] As Toronto's aging population skyrockets, those with mobility limitations should be allowed to continue accessing private vehicle use until transit accessibility and convenience is on par with this use. Until transit convenience achieves this state, older adults and those with mobility issues should have priority when it comes to the use of private vehicles and should be exempt from anti-car measures.

Additionally, across Toronto, the introduction of separated bike lanes has obstructed Wheel-Trans vehicles and created new barriers to accessible transit.[40] The design of Quayside roads could leverage technology to better integrate both accessible and active modes of transit or transportation. Individuals with limited mobility should be the first to access any future modes of transit, such as AVs, and additional measures to improve their access (such as free or reduced-price AV rides for seniors) should be implemented.

EXAMPLES

In **Amsterdam**, laws state that in instances of collisions between cyclists and motorized vehicles, the driver is always at fault.

Amsterdam limits parking spaces in the city centre, and the costs for parking in these spaces are up to five times greater than the parking prices in outer city neighbourhoods.[41] Pairing this anti-car measure with the city's existing cycling, public transit, ferry, and pedestrian networks, and the planning measures that support live-work-school trips by these modes, helps the city limit the use of private vehicles within the downtown core.

Christiansborg Palace, the site of the Danish Parliament in Copenhagen

PUBLIC POLICY AND GOVERNANCE

Today, 82 percent of Canadians live in urban areas and that number is growing quickly. The Province of Ontario projects that the Greater Toronto Area's population will grow by 40 percent by 2041 — bringing the population of the region to 9.7 million people by the time we're middle-aged.[42] We need to take decisive action now to ensure this growth is managed in an equitable and inclusive way. To us, that means making significant investments in critical infrastructure like public transit and housing, and ensuring that all Torontonians, especially those belonging to marginalized communities, are included in future planning processes. It means giving ourselves permission to experiment with bold solutions, and using policy to build a flourishing entrepreneurial and socially conscious economy.

To us, that means thinking creatively about how we invest in infrastructure and work across sectors to deliver public services. It means ensuring that all Torontonians, especially those belonging to marginalized communities, are included in future planning processes. And it means giving ourselves permission to experiment with bold solutions for our urban challenges, and in the process, shaping public policy in Canada and around the world.

PARTNER WITH INDIGENOUS COMMUNITIES IN THE PLANNING, DESIGN, AND LIVED EXPERIENCE OF QUAYSIDE

Post-Truth and Reconciliation Commission (TRC), Quayside should be the new model for city building in partnership with Indigenous peoples. This partnership would demonstrate that innovation and Indigenous engagement and reconciliation cannot be mutually exclusive.

To make this partnership effective, we further recommend that Sidewalk Toronto:

- Establish a "Board of Indigenous Representatives" who can assist in implementing cultural preservation efforts in a respectful way. The board's membership could include representatives from surrounding Indigenous communities, Indigenous architects and designers, and leaders from organizations that support Indigenous peoples. The work of the Board could include advising on how to incorporate Indigenous subject matter into school curriculums. We, as a group of young people, are not comfortable that this has taken a backseat, and are not proud to see this — on a global news stage — represent the City of Toronto. If Quayside becomes home to a public school, we need this to change. We want Sidewalk Toronto to create an environment whereby schools and teachers are encouraged to advocate for Indigenous-focused programming and/or events.
- Use the power of naming to pay respect to Indigenous culture. One example would be to rename at least one of each archetype of the street grid (boulevard, transitway, accessway, and laneway). Street names are not the only option. We believe this renaming must be in direct consultation with the Board of Indigenous Representatives, as they will inform which places might be most appropriate and meaningful to be given an Indigenous name.

Murals on Granville Island, painted by Musqueam artist Debra Sparrow to celebrate Indigenous culture.

EXAMPLES

In Vancouver, we saw numerous testaments to Indigenous engagement:

- Vancouver is located on the unceded territory of the Musqueam, Squamish, and Tsleil-Waututh peoples. As a City of Reconciliation, the City worked with Indigenous representatives to rename two public plazas reflecting the history and heritage of the city — šxʷƛ̓ənəq Xwtl'e7énḵ Square and d šxʷƛ̓exen Xwtl'a7shn. **The Plaza Renaming project** is an example of how the City facilitated an Indigenous consultation group to discuss what representation and cultural preservation looks like for them.

- **Northeast False Creek** exemplified how Vancouver's planners must seek the perspective and opinions of Indigenous peoples in their planning process if they aim to pay tribute to Indigenous history.

- Spencer Lindsay, the Indigenous Engagement Specialist for the City of Vancouver, uses a food preparation metaphor to guide his work. You would not invite people to dinner and expect them to cook, nor would you invite them and ask them what they want to eat after you've cooked it. In the same way, Indigenous consultation needs to happen at the right time and in the right space. Indigenous communities cannot solve a problem for you, nor should you ask them for feedback on a nearly-finished project. To conduct meaningful engagement, organizations need to have done their research and come prepared to listen.

- Additionally, Toronto-based organizations like the **Indigenous Place Making Council** are already doing important work in helping incorporate Indigenous heritage and history throughout public spaces across Canada.[43]

EXPERIMENT WITH INNOVATIVE FINANCING TOOLS AND PARTNERSHIP MODELS TO BUILD INFRASTRUCTURE AND DELIVER SERVICES

Brooklyn Bridge Park in New York City, built with tax increment financing.

The cities of tomorrow will combine traditional infrastructure with disruptive technologies to transform our relationship with the urban environment. However, the social and economic infrastructure gap in Toronto is enormous and governments alone will not have the resources to fund the infrastructure and services required to keep pace with demand.[44] Quayside and the broader Eastern Waterfront revitalization present an opportunity for the municipal and provincial governments to partner with the private and social sectors to experiment with innovative financing tools and partnership models. This means using innovative financing tools like capturing increases in land value to finance infrastructure using tools like tax-increment financing, or leveraging social finance tools so Torontonians can become stakeholders in their infrastructure. Some examples include green bonds to build sustainable infrastructure, community bonds to develop community assets, and social impact bonds to deliver evidence-based social services in the district.

EXAMPLES

Tax-increment financing has been used to finance infrastructure projects in NYC such as the Brooklyn Bridge Park and the extension of subway Line 7 to Hudson Yards, one of the largest redevelopment projects in US history. Both of these projects had been debated for years. While the demand was clearly there, no funding was available to get the projects built.

Green bonds are being issued in jurisdictions around the world to finance sustainable infrastructure from LED retrofits to solar and geothermal projects. Companies like Toronto-based social enterprise, CoPower, have developed green bond products and an easy-to-use platform which enables everyday citizens to finance community-level projects — effectively becoming financial and environmental beneficiaries of local infrastructure.

ESTABLISH A DISTRICT-LEVEL ZONE FOR URBAN PLANNING INNOVATION AND CIVIC TECHNOLOGY EXPERIMENTATION

We need to be bold in our pursuit of solutions for the challenges we are facing across Toronto. All three levels of government should work together to create the world's first district-scale living laboratory to test new technology and service delivery mechanisms in real urban conditions. The innovation zone should span across the eastern waterfront to have the scale required to generate meaningful discoveries.

In this living laboratory, The City of Toronto should define concrete urban problems that need to be solved and layout the parameters for each experiment (in terms of size, scope, and application criteria). The process of applying to participate in an experiment should be streamlined and accessible to all organizations, especially Canadian businesses, nonprofits, and researchers.

It's critical that Sidewalk Toronto provides opportunities for Torontonians to participate by doing things like crowd-sourcing ideas for new experiments and hosting hackathons, for example. Inclusion throughout the process will help ensure that products and services are created from a user-centric perspective, promoting greater acceptance and ownership among end users. Engagement would also help educate stakeholders on the technology being implemented in their neighbourhoods to enable them to take full advantage of it.

By creating a program to reduce barriers for innovation, the living laboratory will reduce time-to-implementation at lower costs for scalable solutions, attract entrepreneurship and investment, and shape future public policy and regulatory decisions at home and around the world.

De Ceuvel in Amsterdam

EXAMPLES

The City of Amsterdam had a problem: a highly contaminated plot of unused industrial land which they didn't have the resources to fix. They issued an RFP seeking an organization to take stewardship of the land, experiment freely with new processes and technologies, and in ten years, leave the land more valuable and biodiverse. The lease was awarded to urban design firm Space&Matter, which has been leading a consortium of urbanists and technologists to transform the old shipyard. Today, **De Ceuvel** is one of the most unique urban experiments in Europe. Through the use of innovative processes and sustainable technologies, the district is purifying the soil and has become as energy self-sufficient as possible by processing waste in new, innovative ways. The district has become a hub for clean tech companies and social enterprises.

Created by the City of Copenhagen, **The Copenhagen Solutions Lab** has set up "laboratories" across the city to test innovative solutions under real urban conditions. Street Lab, for example, is a test area in the heart of the city designed to use network technology and sensors to reduce air pollution and noise, optimize waste collection and water management, and provide intelligent parking. The Lab has established open standards to help strengthen innovation around smart city technology.

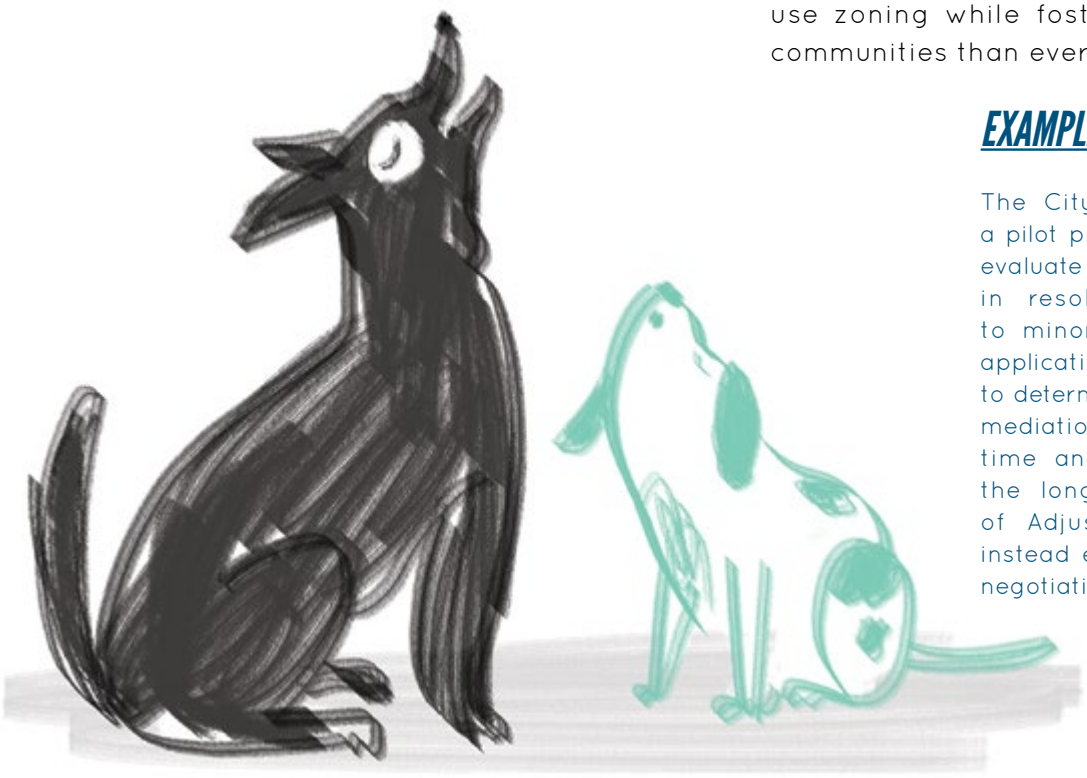
The Lab invites citizens, policy-makers, companies, and researchers to the join the open innovation process through an accessible application process. Organizations just need to submit a brief description of their idea and if the solution meets set criteria, the Lab guides innovators through the test process. This involves providing access to relevant government departments and permits, insights into the challenges facing the city, and hands-on assistance through the process of installing and connecting technology to the City's network infrastructure. All tests in the Copenhagen Street Lab are followed by a thorough evaluation and organizations are free to use the Street Lab and the case study as part of their branding strategy.

Recommendation 14

EXPLORE NEW GOVERNANCE MODELS FOR THE ADJUDICATION OF LAND-USE PLANNING CONFLICTS THAT OCCUR AT QUAYSIDE

Radical mixed-use will increase the frequency and intensity of conflict. For example, the residents in a building might determine that they need a dog kennel to help working pet owners. A unit in the building becomes available, but residents of neighbouring units protest that noise and unsanitary conditions will have an adverse impact on their living standard. One neighbour might be apprehensive about her young children being around potentially aggressive animals. Hundreds of new opportunities for conflict will play out under a radical mixed-use zoning regime. How will these conflicts be managed?

In most land-use planning contexts in Ontario, these conflicts are managed by Committees of Adjustment, municipal planning staff, and the Ontario Municipal Board (OMB). Radical mixed-use needs a more robust, responsive, and context-specific governance model than typical bylaw enforcement and appeals bodies. Condo boards are inadequate adjudicators given that members (being residents of the condo) are directly influenced by the outcomes of their decisions. Sidewalk Toronto must explore new planning and mediation forums through which stakeholders can negotiate fair and constructive solutions. This will help to contain the negative impacts of radical mixed-use zoning while fostering more complete communities than ever before.



EXAMPLES

The City of Toronto conducted a pilot project in 2017 to test and evaluate the benefits of mediation in resolving disputes related to minor variance and consent applications. The goal was in part to determine whether a process of mediation could save participants time and money by bypassing the long, zero-sum Committee of Adjustment procedure and instead encouraging constructive negotiation.

Stepped hardscape design in Boston City Hall

DATA

In a smart city, data is currency. It has the potential to improve services and empower innovation for economic and public benefit. However, residents are concerned about privacy, data governance, and ownership in Quayside. Will this be just another big tech company coming into Toronto to collect our data to sell it? Public-private partnerships like Sidewalk Toronto can be difficult to navigate but they cannot be an excuse to escape accountability to the citizens that they serve.

On our travels, we saw opportunities to level the playing field between citizens and those who own their data. At Waag Technology and Society in Amsterdam, the Smart Citizen Lab places control of data back in the hands of citizens. Residents work collectively with designers and technologists to build their own sensors to tackle public issues such as air quality. Digital literacy enables citizens to understand data relationships while providing community benefit, resulting in an informed population that is genuinely excited about innovation in their city.

Quayside has the opportunity to demonstrate to the world that data can be used to benefit the public. Sidewalk Toronto must build trust through accountability and transparency in the collection, use, and governance of data in order to build an equitable “smart city.”

Recommendation 15

ESTABLISH AN INDEPENDENT DATA TRUST FOR ALL DATA COLLECTED IN QUAYSIDE TO ENSURE STRONG DATA STEWARDSHIP

The *Plan Development Agreement (PDA)* does not outline clear data ownership terms, stating that Sidewalk Toronto will explore "access and potential ownership of data by Waterfront Toronto" including through an undefined "data trust."[45]

In a data trust, a mutual body would be formed to manage data on behalf of the citizens. The data would be held by the trust where there are specific conditions and rules around how the data held is accessed, used, or shared. It is similar to a Research Ethics Board (REB) that reviews and monitors whether research involving humans adheres to ethical standards.

Sidewalk Labs has announced its support for establishing an independent Civic Data Trust that would control all de-identified, aggregated, and anonymized "urban data" collected in Quayside.[46] The trust would also collect, review, and publish Responsible Data Impact Assessments from any entity seeking to collect urban data.

While we agree that a Civic Data Trust is a step towards achieving better data stewardship, this data trust must be a non-profit, third-party corporation comprised of a diverse group of experts and citizens. Data held in the Trust must include personally identifiable information in addition to Sidewalk's suggestion of de-identified "urban data" to reduce re-identification risks. The Trust must also have oversight mechanisms that are proportional to the scale of data collection in Quayside and ensure compliance with all provincial and federal regulatory bodies. These measures will help ensure that the Trust works in the public interest while effectively levelling the playing field between citizens and those who own/hold and control their data in Quayside.

Data stewardship will reside with the Trust and its use will be governed by rules around how data is used, accessed, or shared. It may also create a profit-sharing model to ensure that some of the data-related profit reaped from innovation, development, Intellectual property, and other Quayside activities is returned to the Trust to ensure its sustainability.

Our version of the Trust shifts the conversation away from ownership and towards the ethical use and collection of data. The Trust allows everyone equal access to the data it holds, whether it be a citizen, Waterfront Toronto, or Sidewalk Labs. This can help fuel ethical innovation because the data requested is evaluated for risks before being accessed, used, or shared. Achieving zero-risk is impossible but the risk evaluation process of the data trust can help minimize negative impacts.

EXAMPLES

Quayside's data trust should be formalized in legislation to ensure that these standards will always be in place. **The Institute for Clinical Evaluative Sciences (ICES)**, a non-profit corporation that allows researchers access to health data, is designated as a prescribed entity in Ontario's **Personal Health Information Protection Act (PHIPA)**.

A prescribed entity designation gives ICES the authority to use and disclose personal health data to other researchers because it has practices and procedures to protect the privacy of individuals' health information, and maintain its confidentiality.[47] This includes limiting the collection of information, restricting access by role or on a project-by-project basis, de-identifying personally identifiable information, and determining the uses of certain kinds of data. These practices are approved by the privacy commissioner of Ontario and reviewed every three years.

Recommendation 16

CREATE AND MAINTAIN AN OPEN DATA PORTAL TO ENCOURAGE INNOVATION FOR THE PUBLIC GOOD

Data collected in Quayside should be used to drive innovation in improving urban spaces for citizens. We want to leverage the strengths of both private companies and the city's individual developer community and, as such, recommend that the independent data trust create an open data portal for both private and individual civic use.

This data portal should be hosted by the independent data trust, and allow both companies and individuals to access de-identified data from Quayside to power innovation. With such a wide platform, the independent data trust must implement and maintain appropriate data access standards to increase its usability and impact.

Alongside the potential benefits from the private sector, including improved applications and user-friendly digital systems, open data would also allow and encourage development from individual or small-scale independent groups. If the public is able to use Quayside data to power their personal projects, or create projects where anyone can contribute (i.e., open-source), engagement will increase, from developers in Toronto and all over the world.

These technology projects can be a great asset to improving quality of life in Quayside by being implemented in the digital layer. Taking safety concerns into account, we recommend that Sidewalk Toronto establish an innovation board to regulate the implementation of private and open-source projects in Quayside.

EXAMPLES

Edmonton has an exemplar **open data portal** which was implemented in 2010 and has been active since.[48] It allows citizens access to municipally collected data, publishes government-internal projects and open-source projects to a blog, and has a data request system called "Suggest a Dataset" that we recommend Quayside also implement.

Recommendation 17

COLLECT DATA TO BUILD COMMUNITY TRUST AND EMPOWER PUBLIC GOOD

Sidewalk Toronto must acknowledge public mistrust of data due to its dual-use nature and prioritize resiliency against malicious actors or changing political regimes. All data governance (including policies of the proposed data trust) must be codified in legislation to ensure accountability and democracy.

We propose that data collection issues be addressed starting at sensor level. Sensors should only be implemented if they are democratically approved by the independent data trust, wherein the approved sensors should also be reviewed by the independent data trust. No override functions should be available to reverse these limitations. If citizens feel uncomfortable with the idea of certain data being picked up from their interactions with the public digital layer, they should hold the power to decide what public sensors should be implemented in places near them. There should also be open and accessible information and discussion opportunities for the community at large to question and debate new sensor implementation. Decisions regarding data collection should be presented to the public and reviewed by experts before implementation.

Quayside's data collection must proactively combat bias and malicious misuse to build trust with citizens. Data collected should be ethical, fair, and reflective of the city/region. With time, we hope that Toronto will understand the positive impacts of data in civic technology.

EXAMPLES

The Independent Electricity System Operator (IESO) runs a province-wide smart energy meter in Ontario to better track electricity consumption and local distribution of energy. They have implemented a Data Strategy Advisory Council that reviews and provides input to the development of products and processes that are used in this smart data repository.

Recommendation 18

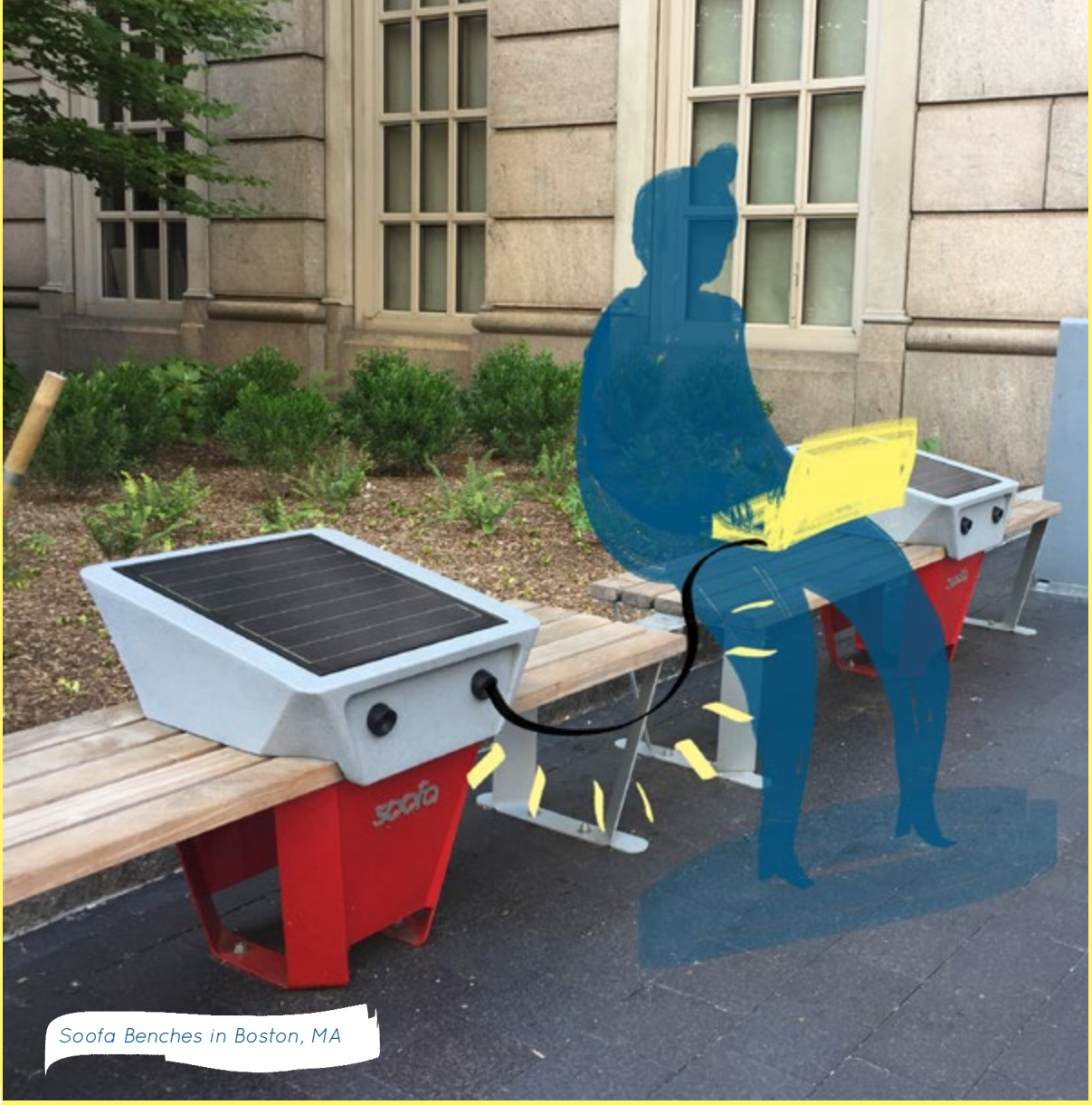
ADDRESS MEANINGFUL CONSENT AND ITS IMPACT ON PUBLIC SPACES IN THE MASTER INNOVATION AND DEVELOPMENT PLAN

While our proposed data trust examines data stewardship and how data is used, there are broader issues about how data is collected. The collection of data — personal or behavioural or both — in public spaces in Quayside with sensor and/or video technology presents a challenge to informed consent (where citizens agree to the collection of data and its uses before it is collected). Sidewalk Toronto must address issues related to how consent will work in sensor-laden environments as well as the ethics of data gathering in public spaces.

Data collection must be clear to citizens before the collection occurs, including when it is aggregated. Obtaining meaningful consent in the public realm will be challenging since passive sensors may have a radius that extends beyond the object itself.

Ontario's current privacy framework only provides legal protections to individuals when they are personally identifiable. However, Sidewalk Toronto must address how the collection of data — personal, anonymized, de-identified, or aggregated — may also raise re-identification risks that could impact individuals.

Proper consultation with Canadian stakeholders and regulators can meet legislative requirements and privacy expectations. In contrast to the American legislation, MAC addresses are considered personally identifiable information and not anonymous information in Canada.[49]



Soofa Benches in Boston, MA

EXAMPLES

On our travels, we saw many positive uses of data and technology but we were also aware of harmful things that were invisible to us. In Boston, **Soofa Benches** are part of the smart city movement to have tech embedded in urban furniture. These benches provide a nice place to sit, charge your phone, and access free Wi-Fi, but it's more complicated than it seems. The bench collects data from sensors about how the area near the bench is being used and sells it to stakeholders like municipalities.

Soofa benches passively collect data from Wi-Fi-enabled devices, such as their unique MAC address, manufacturer information, and signal strength. Soofa claims that the data is non-identifiable and that they apply a cryptographic function to the MAC addresses to further anonymize them.[50]

In order to opt-out of data collection, people would need to be aware that they must turn off their Wi-Fi before entering into the range of the sensor. However, there are no signs or notifications that caution the public before entering into the radius of the Soofa bench sensor.

The Soofa bench case study may seem innocuous because it is one bench, but the scale of collection proposed in Quayside poses a challenge to meaningful consent in the public realm if these capabilities are widespread.

Recommendation 19

ADVOCATE ALL-AGES DATA LITERACY THROUGH HANDS-ON EDUCATIONAL INITIATIVES INTEGRATED WITH TORONTO'S EXISTING TECHNOLOGY COMMUNITY

Quayside must prioritize data literacy as a cornerstone and integrate it with communities to allow people to understand and shape their everyday digital systems.

A digitally-literate population that understands the implications of their interactions in a data-centric world will be empowered and motivated to contribute to and champion innovation on the digital layer. The future of innovation in a smart city will be powered by data. Building trust through transparency will empower citizens to contribute to innovation in the service of humanity through non-monetary means.

Sidewalk Toronto should advocate for digital literacy and computer science fundamentals to be mandatory for students in grades 7-10, so all people have the opportunity to learn about the digital layer around them from a credible source. Affordable continuing education courses should be promoted to increase digital literacy for working adults. Existing community organizations such as Canada Learning Code, Civic Tech Toronto, and Data For Good should be engaged to utilize Toronto's technology community as teachers, mentors, and inspiration.

As using data to influence social change becomes mainstream, Sidewalk Toronto should engage with academic institutions to provide opportunities for students to collaborate across disciplines and with industry partners. For example, architecture and computer science students could partner with City Hall to consult on experimental technology-backed public infrastructure to be tested in Quayside, creating the next generation of interdisciplinary learners who are excited about bringing civic technology to life in their own city.

Additionally, all active applications in the digital layer that use citizen data in real time should be registered in a database and continually updated when new data points are logged. A one-click option must be provided to anyone who wants to disable an application from using their data. Giving citizens control of the flow of their information means giving them peace of mind, which is integral to the success of a smart city.

EXAMPLES:

CityStudio Vancouver is a makerspace that enables citizen scientists to democratize art and technology projects. CityStudio engages post-secondary students in semester-length projects to encourage young Vancouverites to contribute to civic tech initiatives.

MIT Senseable City Lab is an academic lab of designers, planners, and engineers who collaborate to "develop and deploy tools to learn about cities — so that cities can learn about us."[51]

The **DECODE** platform, including a digital wallet research project underway at **Waag Society** in Amsterdam, proposes the creation of a social digital identity to allow citizens to selectively grant access to their data across platforms.

Superkilen Park in Copenhagen

DESIGN

Quayside should be grounded in what is our greatest asset as a city: our diversity. Toronto is made up of people from over 230 countries speaking more than 140 languages, 51 percent of whom are foreign-born.[52,53,54] Quayside should be designed first and foremost for all Torontonians, and as a secondary focus, provide a welcoming place for visitors from around the world. Whether you're a senior in Markham, a first-generation immigrant putting down roots in Regent Park, or a young professional working in the Eastern Waterfront, we want the neighbourhood to hold a place for you.

Throughout our travels, we saw how collaborative, user-centred design transformed built and digital environments thoughtfully — from transportation to the public realm. In New York, we compared the animated, amenities-filled Brooklyn Bridge Park with our hyper-commercialized, "extraordinarily ugly" Yonge-Dundas Square.[55] In Copenhagen, where 62 percent of residents bike to work or school, we imagined how the city's spacious cycling infrastructure could be applied to Toronto's car-first roads.[56] And in Amsterdam, we spoke to entrepreneurs about how they are putting privacy-by-design into practice through a mobile app that manages your online identity reliably and securely.

In "Our Outlook on the City and the Waterfront Today," we've outlined the challenges people in our city face, and in "Our Vision for Quayside and the Waterfront" we elaborate on what we as Toronto residents envision Quayside to be. Quayside should be designed to address these needs and wants and must showcase Toronto as a leader and pioneer in inclusive, smart city design.

Recommendation 20

SET A NEW STANDARD FOR INCLUSIVE, TRANSPARENT PUBLIC ENGAGEMENT ACROSS ALL PHASES OF QUAYSIDE DESIGN, PLANNING, AND DEVELOPMENT

We appreciate that Sidewalk Toronto's current Engagement Plan provides different opportunities for Torontonians to get involved and informed, from design jams to our Fellows Program. But we believe the project can do more and do better. Good design is based on including the perspectives of the public at every step of the process — an approach known as human-centred design — and Sidewalk Toronto has the opportunity to set a new gold standard for what inclusive, public engagement looks like.

Firstly, Sidewalk Toronto must ensure that all Torontonians have a seat at the table — especially the underrepresented. For example, the Sidewalk Toronto Engagement Plan includes one short, nondescript blurb on the back cover on "commitment to Indigenous people" without elaborating any specific plans or processes, while in the *Sidewalk Toronto Residents Panel Interim Report*, the panelists acknowledged the difficulty of considering the important perspective of Toronto's Indigenous groups because they didn't have the chance to hear directly from them (though it should be noted that panelists were able to meet with representatives from the Mississaugas following the release of the interim report). These traditionally underrepresented groups — Indigenous communities, racial and ethnic minorities, and youth and seniors — should be included in Toronto's planning and development.

We want to address what transparent public engagement can look like. Future users should be involved as much as possible, transforming public processes into a pro-active proposition, and be able to see their feedback and suggestions directly in the design plans. We saw this in Superkilen Park. Located in Norrebro, one of the most ethnically diverse parts of Denmark, local residents took part in extensive public engagement to create "a world expo" that integrated their backgrounds and culture into the landscape — literally. The park includes Moroccan fountains, neon signs from Moscow, and a giant plastic octopus from Japan that doubles as a slide, all of which were suggested by residents.

Digital platforms like Facebook have already been used by Sidewalk Toronto to stream talks to a wider online audience. The organization should continue experimenting with how out-of-the-box technologies can bolster transparency and inclusivity in public participation. CrowdBuilding, a Dutch real estate development firm founded by Space&Matter, uses an online platform to connect potential residents sharing similar values or interests as co-creators of residential community projects.[57] Block by Block Foundation by UN-Habitat empowers community members to design their own public spaces in the popular sandbox video game Minecraft.[58]

Sidewalk Toronto can be a shining exemplar to other cities of how upholding inclusive, transparent, participatory democracy leads to smarter city design.

Public art by Justin Langlois along the water in Vancouver

EXAMPLES

In Vancouver, where we saw a diverse demographic of residents similar to Toronto's, we were inspired by recent initiatives to engage Indigenous and African-Canadian populations in the planning and development process.

For example:

Hogan's Alley, the nickname for a now-demolished alley, had been Vancouver's African-Canadian neighbourhood. As part of Vancouver's Northeast False Creek development, the Hogan's Alley community was engaged in the planning process, advocating the recognition of public and cultural space for the black community. Their inputs have led to the planned establishment of a community land trust and a cultural centre on the Hogan's Alley block.[59]

In New York, as part of the World Trade Centre Redevelopment, we saw the scale that public participation can reach. The Regional Plan Association (RPA) hosted **"Listening to the City"**, an enormous 4,300-person forum that gave participants an opportunity to provide feedback about concept plans for the site. Participants came from all over the region and represented a variety of backgrounds; technology allowed for instantaneous, transparent engagement. The in-person and online events led to the rejection of several sets of master plans, in part due to people's concern of too many office buildings on a now sacred, historic piece of land. As Daniel Libeskind, the site's master planner, put it, the mandate for the redevelopment was to create "a space for people, not just corporations."[60]

BUILD FLEXIBLE SPACES THAT INDIVIDUALS CAN DESIGN AND CONTINUOUSLY ADAPT TO THEIR NEEDS AND WANTS

Hans Ibelings, an architectural historian at the University of Toronto, once criticized the "sheer ubiquity and relative uniformity of [Toronto's condominium towers]" as a call-to-action for the city to be built more thoughtfully.[61] The power that developers and planners have in dictating our surroundings — and frankly the boringness of our buildings — can be seen in other structures across our city, from the Gardiner Expressway to our shopping malls. Ultimately, it leaves communities disengaged and uninspired by the spaces we live and move in.

We believe spaces should be flexible, where individuals have the agency and desire to "personalize" their surroundings and fully express their creativity. This also ensures future-proofing, where spaces can anticipate and respond to events even when they unfold in unpredictable ways. So, how can we build for flexibility?

Raw spaces should be designed only with basic services and amenities, including water, plumbing, heating and cooling, and Wi-Fi, for maximum adaptability. Superlofts, by the Dutch firm Marc Koehler Architects, is a "co-living" community that offers spacious unfurnished concrete lofts in which residents can customize or self-build their dream home based on their lifestyle, taste, and budget.[62] We toured vibrant, personalized units that included a family-friendly three-bedroom and a turn-key luxury bachelor pad.

Tactical urbanism, also known as "do-it-yourself urbanism," creates temporary, low-cost pop-ups by the community, for the community. Take a walk down King Street, and you can see this in full effect.[63] As part of the Everyone is King Design Building Competition, pop-up parklets are decked out with colourfully painted country chairs, milk crates acting as a bench, and foam noodles forming a jungle gym, designed and built by young Torontonians.

Generative design tools also help city builders design flexibly by making better data-informed decisions. At the Sidewalk Labs office, we saw a demonstration of their generative design software which allows planners and architects to input data and run analyses in weighing thousands of potential solutions at the neighbourhood level. We believe the potential of these tools are enormous for taking individuals' preferences and desires into account, including at more micro, building-specific levels. For example, what if staff could optimize their seating arrangements in an office space, or residents their own floor plans for environmental performance in Quayside? The Living design studio did exactly this when designing the new office space in the MaRS Innovation District.[64] Using measurable goals like work style preference, adjacency preference, daylight, and productivity, they generated 10,000 design options that were evaluated and refined over time.

Superlofts, flexible living spaces in Amsterdam

Recommendation 22

CREATE AN INTEGRATED, MIXED-USE NEIGHBOURHOOD THAT PROMOTES COMMUNITY HEALTH AND WELL-BEING

Quayside is imagined as a mixed-use development, blending residential, commercial, cultural, and institutional uses into one neighbourhood. We believe three enablers can help Sidewalk Toronto create spaces and places that are what we've coined as the "3 I's": Intergenerational, Interactive, and Integrated.

To develop a complete community on 12 acres is ambitious, and we believe Sidewalk Toronto has the opportunity to push the envelope on novel vertical mixed-use typologies. Harvey Corbett, architect and urban "futurist," envisioned in 1928 that green spaces, schools, homes, and offices would be stacked on top of each other. Fast forward to today, we see these vertical mixed-use buildings as a way to conserve valuable land resources, produce energy and building efficiencies, and brighten communities. Generally, the rule of thumb has been ground floor for retail and office, and upper floors for residential use. But in Europe, we saw rooftops being transformed into an extension of the public space. Space&Matter, an Amsterdam-based firm, designed an aquaponics farm on the roof of a former factory turned office space. And senior housing developers are making upward strides in the Manhattan market through a 15-storey senior living development with assisted-living services, and community and outdoor spaces interspersed throughout residential floors to create "mini neighbourhoods."[65]

We want Quayside to be physically integrated — fence- and barrier-free. We noticed how the fencing off of public skateparks and community gardens on Governors Island and in Domino Park in New York created a sense of exclusivity and inaccessibility. In Copenhagen, Israels Plads and Islands Brygge Park feature basketball courts, skateparks, and harbourside baths that are open and visible to the entire park. To us, this is an active design feature that promotes and welcomes social and environmental interaction.

Tying into active design principles, the design decisions and success of solutions across all of Sidewalk Toronto's pillars — from mobility to housing — should be measured by community health and well-being outcomes. In Malmö, the City explained how they plan for social sustainability to improve health equity. This struck a chord as we noticed a comparative lack of health and social service examples during our travels. We believe that health and well-being should cross-cut every pillar, taking into account the walkability of streets, amount of nature and greenery, and quality of relationships in residences as social determinants of health.

Domino Park in New York City

EXAMPLES

The wide disparity in the levels of health between Malmö's different socioeconomic groups is a pattern echoed in other major cities around the world. To gather evidence and propose strategies to this challenge, the **Commission for a Socially Sustainable Malmö** was formed in 2010, one of the world's first local commissions for reduced health inequities. The Commission's work led to two overarching recommendations covering a total of 24 objectives and 72 actions, including on residential environment and urban planning.[66] Annual follow-up has been conducted to measure and evaluate progress towards objectives.

Dialog, a Toronto-based integrated design firm, has published the Community Wellbeing Framework, a methodology to help design professionals understand, measure, and evaluate the impact of their work on community wellbeing.

Recommendation 23

INFUSE PUBLIC ART INTO THE BUILT ENVIRONMENT THAT PROVOKES AWARENESS, EDUCATION, AND ACTION

Our built environment should heighten awareness on critical urban issues such as climate change, racial inequality, and data privacy, as well as civic issues such as voter engagement and air pollution. We believe public art can be a powerful medium to do so, by creating imaginative, vibrant neighbourhoods and catalyzing social and economic benefits for citizens.

From the onset, new structures including utilitarian ones should be designed with the same degree of thoughtfulness and craft as a work of art. Take a stroll through Sherbourne Commons to see the Light Showers, a water installation. Listen to the sound of running water drown out the sounds of cars, watch people relax and play, touch the water. Look closely, and you'll start to understand that the park is also purifying stormwater from our streets before your eyes.

It's not just new structures, but existing ones too. Integrating socially conscious public art into existing structures around Quayside and Toronto can beautify our built environment and promote education and awareness of history, heritage, and social issues to a broader audience. On the facades of Granville Island's bridge pillars, Musqueam artist Debra Sparrow painted murals inspired by Indigenous culture, and a bio-wall in Copenhagen's City Hall brightened up the office space with floor-to-ceiling green foliage. Imagine what we can do with the grain silos beside Quayside!

Experimenting with unconventional building materials and methods can challenge and improve the way we build sustainably, and introduce new textures, colours, forms, and experiences as public art into our environment. MX3D is a robotic technology startup that is forging the future of design and manufacturing. At the startup's office, we admired the intricate textures and interwoven metal designs of their prototypes. We were invited to see the steel pedestrian bridge they 3D printed in-house. It will be installed over one of Amsterdam's canals and will include built-in sensors to measure its performance and safety in real time.[67]

Finally, data collected in Quayside can be visualized and incorporated into public art. Real-time, interactive data visualizations can empower storytelling, distill complex relationships into understandable insight, and encourage people to frame their understanding in the context of their own individual impact. Senseable City Lab at MIT dedicates a team to building data visualization projects which are published online and in academic journals. These projects can be incorporated into our public spaces too.

"A False Creek" by Rhonda Weppler and Trevor Mahovsky

EXAMPLES

Northeast False Creek Neighbourhood Energy Utility in Vancouver has a number of artistic features that bring the process within the building into the public eye.[68] The facility's Five Fingers Smoke Stacks light up based on the amount of energy the neighbourhood is using. There are also a series of openings on street level that allow people to peer directly into the mechanical rooms.

A False Creek is a series of horizontal bands painted in different shades of blue on the columns of the Cambie Street Bridge.[69] Each band rises higher above eye level for people to visualize the threat of rising water levels in False Creek.

Recommendation 24

SHARE LEARNINGS BY PUBLISHING A DESIGN GUIDE THAT INFORMS, INSPIRES AND EMPOWERS CITIZENS AND CITY BUILDERS

Sidewalk Toronto's mission to build a complete "smart" community from the ground up amidst a booming megacity is ambitious and unprecedented. The success of this project has the potential to showcase Toronto as a leader and pioneer in smart city design.

The City of Toronto already has an Official Plan and a set of Design Guidelines that are available to the public online. However, they are supplied only as static PDF documents and navigating through them can be disorienting when looking for specific advice.

Sidewalk Toronto should provide a cohesive knowledge-sharing platform that democratizes learnings from Quayside. This "toolbox" will serve dual purposes: to inspire and empower citizens to design and build in their communities, and to enable city builders around the world to adapt lessons to their own cities. We envision the toolbox to be a continuously updated, digital platform that is accessible and engaging in language and format. It should be up-to-date with concepts, principles, and open-source tools, focusing on overlooked and emerging trends in city planning and design, such as Indigenous reconciliation, AVs, and robotic fabrication.

The High Line in New York City

Temple of Mnemon"" by Anne Lilly, an interactive art installation on the Rose Kennedy Greenway in Boston

EXAMPLES

Auckland Design Manual is a free online resource for designers, planners, and developers provided by the Auckland Council.[70, 71] It acts as a step-by-step guide from the design through development of a project, while providing case studies that demonstrate local design values. For example, Kopupaka Reserve is one case study of how designers referenced elements of the Māori culture in the design of the park.[72]

Did you know that the Times Square we know today as one of the most photographed public spaces in the world started off as temporary street closures, paint, and inexpensive beach chairs? The **Tactical Urbanism Guide** acts as a one-stop-shop for citizens prototyping temporary, low-cost changes to their cityscape, where they can follow guidance and get inspiration for suitable project materials.[73]

Governor's Island in New York City

PUBLIC SPACES AND AMENITIES

Good public spaces should be more than just eye-candy. They should be integrated into the local communities, and should allow residents to meaningfully interact with each other and with the environment. A combination of carefully placed amenities, along with the freedom for users to make the space their own, are some of the ingredients we've seen in other great public spaces on our travels. With the price of housing marching ever upwards, and likely with smaller units to match, it is crucial that the public spaces of Toronto's future are open, flexible, and welcoming to everyone.

Recommendation 25

MAXIMIZE COMFORT AND USABILITY OF OUTDOOR PUBLIC SPACES FOR TORONTO'S RAIN AND SNOW

Weather is an inextricable part of the Toronto experience, but it doesn't need to rain on our parade. Sidewalk Labs is already working with a number of partners to double the number of hours in a year that Quayside is thermally comfortable. While this is a fantastic start, we believe that further weatherization techniques can make Quayside public spaces valuable even during Toronto's less hospitable weather conditions.

The goal of weatherization is to increase usability while also decreasing the maintenance effort required. We have seen two major categories of weatherization techniques: passive solutions that are built into a space, and active solutions that require power. The thermal optimization project is entirely passive, while some of Sidewalk's other proposals (extendable rooftop eaves, heated pavement tiles to melt snow) are entirely active and appear somewhat impractical. We believe a combination of active and passive techniques could provide Quayside with the benefits of weatherization at the lowest cost.

EXAMPLES

Enghaveparken, a public park in Copenhagen, uses a purely passive solution that captures rainfall as part of the stormwater management system. During cloudbursts, the lowered areas in the park can completely fill with water to transform into a reflecting pool. Copenhagen's City Architect, Tina Saaby, noted that people are fascinated by the process, and that "the park gets busier as it rains."

Bo01 in Malmö also features a passive stormwater collection solution, but integrates active elements with numerous fountains that add to the ambience of the setting. We imagine that instead of fountains, the captive stormwater could be actively used as grey-water in Quayside to lower freshwater consumption.

The High Line in New York City is a beautiful public space, but when it snows the many staircases in the park need to be shovelled by hand, which would be impractical in snowy Toronto.

A passive solution to this problem would be designing parks with smooth ramps instead of stairs to be snowblower accessible. An active solution could be using Sidewalk's heated pavement tiles to melt the snow. This passive solution is too constraining to the design of public spaces, and the active solution is too expensive. Instead we believe a hybrid solution, where most spaces are clearable by snowblower and only stairs and other hard-to-reach locations are equipped with Sidewalk's heated panels, would be the most effective and economical.

REDEFINE OUR CITY'S RELATIONSHIP WITH LAKE ONTARIO BY MAKING IT MORE VISIBLE AND ACCESSIBLE

Lake Ontario is a beautiful feature of our city that deserves to be celebrated, not restricted. Compared to other cities we visited, much of our city's development history has neglected the water as a primary asset of our public realm. Controversial debates around the Gardiner Expressway, Billy Bishop Airport, and luxury tower condos have all highlighted the faults of our city's design by way of restricting access to the waterfront and impeding community relationships along the water. Although great efforts have been made by Waterfront Toronto and other organizations to revitalize and animate our waterfront, visibility and access to the Lake is still restricted by impeding infrastructure, inaccessible spaces, and discomforting environments. Quayside should reverse this direction.

Harbour baths in Copenhagen

EXAMPLES

The Hills on Governors Island in New York City are unique and clever features that emphasize the best vantage points of the East River, Manhattan, and the Statue of Liberty. These human-made hills were constructed from recycled demolition debris and act as a flood mitigation tactic. However, the Hills appear as natural mounds that enable opportunities to explore the edge zones of New York City's waterfront.

Copenhagen harbour baths are structures that extend public spaces into and on top of the Harbour. In the late 1990s, Copenhagen committed to cleaning the harbour water so that it was safe for people to swim in. The harbour baths celebrate this achievement by enabling opportunities for people to interact with the water. The Harbour Baths' design is also compelling in the various ways they dare users to engage with the waterfront. Some Harbour Baths have a variety of heights you can jump off from or a launching slide for your kayaks.

Recommendation 27

EQUIP PUBLIC SPACES TO BECOME AN EXTENSION OF A FRONT AND BACKYARD

The density of downtown Toronto means that the luxury of private outdoor space is either out of reach or limited to the often poorly designed building-level communal areas. Barbeques, play sets, garden plots, and more may seem like luxuries only suited for suburban living, but we know there is a place for these amenities in the heart of the city as well. Rather than losing or limiting our opportunity to flourish outdoors, our city parks can better meet these needs so that the well-being of those living in urban environments and in Quayside is not compromised.

Toronto is already a very dense city and our public spaces have struggled to keep up with our growth. City parks that are barren, open fields, with little to no amenities or animation, fail to provide complete community living opportunities. We've seen parks, such as R.V. Burgess Park in Thorncliffe Park, transform when properly equipped with amenities that serve the community. An example of this are the public tandoori ovens provided as a result of lobbying by the Thorncliffe Park Women's Committee.[74] As a result, residents are able to use the park as an extension of their balconies or backyards to thrive. We recommend that Sidewalk Toronto equip public spaces with the amenities that communities need.

EXAMPLES

Playful Copenhagen. Seamlessly integrated into public spaces are features that invoke playfulness. We saw trampolines on sidewalks, rock climbing walls along alleyways, jungle gyms masked as sculptures, and bright coloured buildings that remind us to enjoy our surroundings. By equipping spaces with the amenities that allow people of all ages and abilities to play, recreation takes precedence in a community and does not need to be restricted to the confines of private spaces.

BBQ ready Brooklyn Bridge Park. Select piers of the park are equipped with barbeques and picnic tables. Strategically integrated into the public space, these amenities catalyze meaningful opportunities for people to come together and enjoy the social well-being of one another and their environment without feeling confined to the square footage of their housing unit.

The Bentway in Toronto is a space already equipped for play and interaction

CONCLUSION: OUR VISION FOR QUAYSIDE AND THE WATERFRONT

As the Sidewalk Toronto Fellows, we represent a cross-section of young Torontonians: early-career professionals and students with different backgrounds and interests; from planners and architects to engineers, technologists, and policy-makers. What we have in common is a shared passion for the city we call home and an unwavering belief in its potential. The Fellows Program represents what we love about our city and what other cities point to as inarguably our greatest strength: we are residents of diverse communities who contribute to a unified collective. Together, we crafted this report to inform the Sidewalk Toronto project of the issues that matter most dearly to us.

Quayside and Toronto have the potential to serve as a visionary model for how sustainable, innovative solutions can address civic challenges. We imagine a complete, mixed-use, and mixed-income community that is livable and affordable; enables citizen-centric democracy and autonomy; and is home to a population as diverse as the Greater Toronto Area. We want Quayside to instill a sense of wonder, playfulness, and delight in both residents and visitors alike; to challenge what is possible; and to be a testbed for thoughtful innovation.

As Sidewalk Toronto drafts the Master Innovation and Development Plan for Quayside, we commend the residents, community groups, organizations, and government entities that have tirelessly worked towards making our city a place we're proud to live in. We would also like to thank those who have mobilized to hold Waterfront Toronto accountable as a tri-governmental organization and Sidewalk Labs as a private corporation, in the face of a project that may set Toronto on a trajectory which, once finalized, could be difficult to reverse.

DESPITE THE WORK THAT HAS ALREADY BEEN DONE, WE TOO HAVE HESITATIONS ABOUT THIS PROJECT:

- Does collaborating with a company owned by a technology behemoth piloting their first "smart city" project align with our interests? We want our governments to retain their autonomy and agency. We want our governments to be the ones leading public policy development.

- How can we ensure that Quayside is able to adapt to future innovations and is not over-engineered to current technological and social needs?

- There are existing neighbourhoods in Toronto that continue to struggle. How will the lessons learned at Quayside positively or negatively impact these communities? What will equity and inclusion look like in Quayside in practice? Quayside should serve as a catalyst for unity in the city, not division.

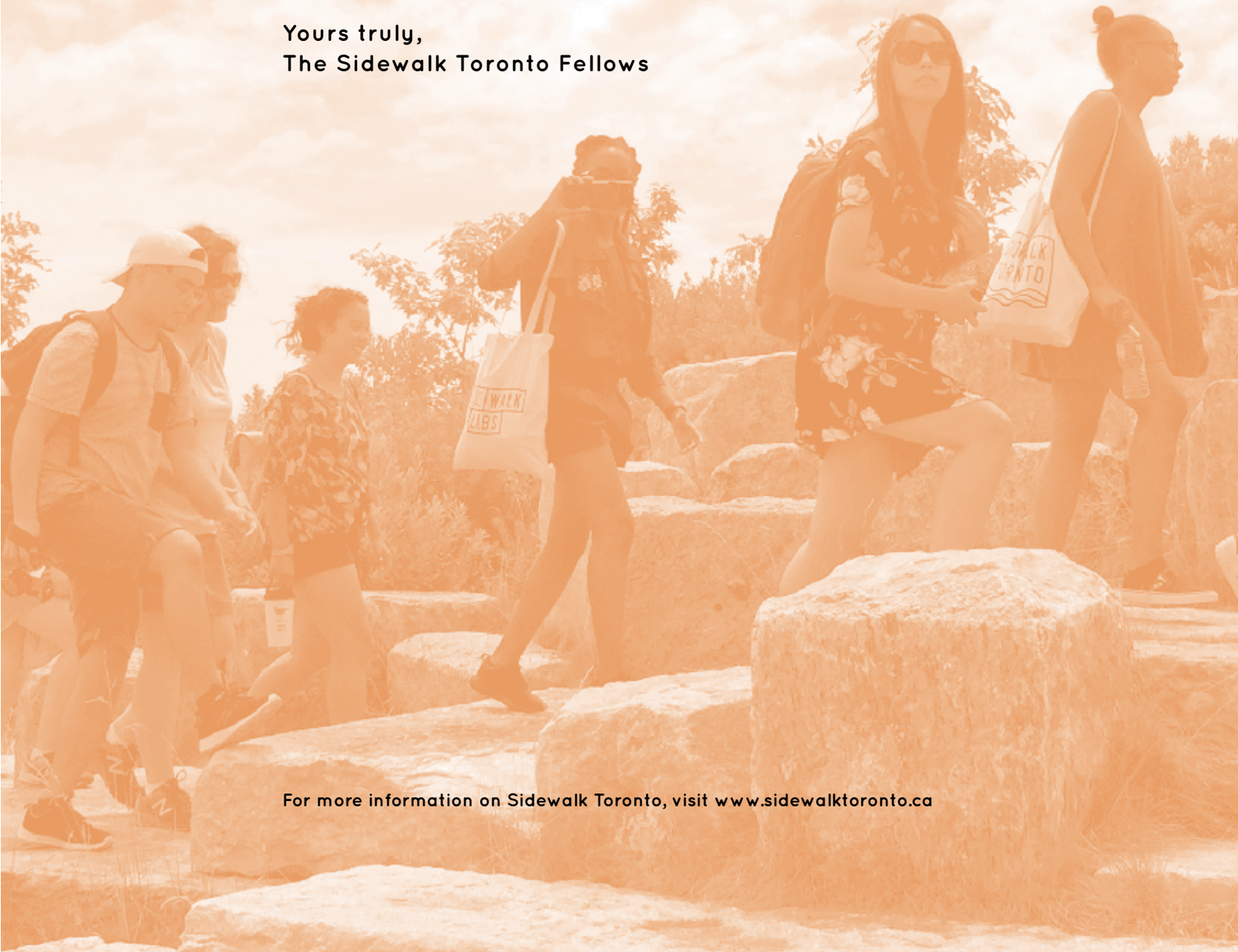
- How do we ensure that technology is being used to improve the human experience in Quayside, and not just for its own sake?

- Will strong intellectual property rights be established to defend Canadian innovation?

We encourage Torontonians to continue to advocate for their communities. In return, we expect Waterfront Toronto, and the City at large, to listen and learn along with everyone who calls this city home. As we look beyond this Fellowship, we will also continue to be engaged in this process as members of the public.

Toronto, this report is for you. We don't have all the answers, and we know that the challenges we face are immense, but we believe that the potential benefits are so great that we must consider this endeavour. The future of our city is being shaped now, and it is crucial that we all take part.

Yours truly,
The Sidewalk Toronto Fellows



For more information on Sidewalk Toronto, visit www.sidewalktoronto.ca

GLOSSARY

Active space: Any space that encourages physical activity, for instance to basketball courts, soccer fields, play structures, and skateparks.

Active transportation: Human-powered transportation such as walking, cycling, and variants such as wheelchair, handcart, scooter, in-line skating, or skateboarding.

Aggregated Data: Data that has been compiled from several measurements. It aims to collect and process data in a way that makes it impossible to link the data to the individual by any means.
Example: Using age ranges instead of specific numbers when collecting data.

Algorithm: A set of rules on how to solve a class of problems.

Anonymized Data: "Data collected is rendered anonymous in such a way that the data subject is not or no longer identifiable."[75] Anonymized data does not contain any identifiable information, making it impossible to identity any person, even by the people who are anonymizing the data.
Example: Data from a motion detector.

Aquaponics: The process of growing plants overtop a fish tank. This kind of controlled growing environment allows the exchange of nutrients between the plants and fish to occur.

Autonomous vehicles (AV): Vehicles that operate independent of the driver.

Business Improvement Area (BIA): A municipal district responsible for the promotion and development of local businesses.

Business improvement district: A defined area within which businesses are required to pay an additional tax (or levy) in order to fund projects within the district's boundaries.

Circular economy: A system that aims to minimize waste, maximize the value and use of products and resources, and re-use and recover products at the end of their service life. This contrasts our traditional linear economy model of "make-use-dispose," and requires us to redesign our modern industrial system with a focus on both ecological and human systems.

Community bonds: An interest-bearing bond that can only be issued by non-profits. Bonds are targeted to small-scale, unaccredited investors.

Community land trust: Community land trusts are non-profit, community-based organizations designed to ensure community stewardship of land. Community land trusts can be used for many types of development (including commercial and retail), but are primarily used to ensure long-term housing affordability.

Data Trust: A mutual body formed to manage data on behalf of the citizens. The data would be held by the trust where there are specific conditions and rules around how the data held is accessed, used, or shared.
Examples: The Institute for Clinical Evaluative Sciences (ICES) is a non-profit corporation that allows researchers to access health data. The Independent Electricity System Operator (IESO) runs a province-wide smart energy meter in Ontario to better track electricity consumption and local distribution of energy.

De-identified Data: "De-identification is the general term for the process of removing personal information from a record or data set. De-identification protects the privacy of individuals because once de-identified, a data set is considered to no longer contain personal information."[76]

Differential lease rates: A dynamic lease rate system which aims to attract certain types of retail tenants and businesses in a neighbourhood. For instance, offering relatively affordable rates to attract small businesses and non-profits.

Dynamic congestion pricing: Congestion pricing is a demand management tool that charges automotive vehicles traffic fees when travelling into or within a predetermined area of high congestion. Dynamic congestion pricing is an approach to control the traffic flow on the network by setting variable tolls that are adjusted based on real-time traffic conditions.

Edge computing: Processing data in real time where it is being generated, instead of moving it over a network to a centralized data warehouse. This improves security as data is not moved and is destroyed when no longer necessary.

Future-proofing: Designing to anticipate change in the future.

Generative design: A design method that uses computation to create a wide variety of design solutions based on a set of rules and conditions.

Green bonds: Green bonds are designated bonds intended to encourage sustainability and to finance climate-related or other types of special environmental projects.

MAC Address: A unique identifier used to identify a networkable device.

Open data portal: A centralized repository for civic datasets which is freely and widely available to the public.

Open source development: A community-based development paradigm that encourages programmers to collaborate on projects where the underlying code is available to the public on a central portal (e.g., GitHub). In contrast to closed-source projects, where the code is secured by a corporation or individual.

Parklet: A small, temporary seating area or gathering place that is built overtop of a parking space.

Placemaking: Being involved in creating meaning and/or personal value in the spaces we occupy and gather in.

Prescribed Entity: A designation of an organization, body, or corporation that gives them authority to use and disclose personal health data under s.45 in Ontario's Personal Health Information Protection Act (PHIPA). This designation is given after the Privacy Commissioner of Ontario approves its practices and procedures to protect the privacy of individuals' health information, and maintain its confidentiality.

Radical mixed-use: When residential, commercial, retail, and institutional land uses coexist in the same building regardless of their stark differences.

Re-identification Risks: "Any process that re-establishes the link between identifiable information and an individual".[77] Large datasets and pervasive data collection may make re-identification of individuals easier through big data and machine learning, which use algorithms to find correlations to make predictions from data.
Example: New York Taxi details can be extracted from anonymized data through unlikely datasets like paparazzi photos and reverse-engineering.[78]

Reconciliation: Restorative action taken to acknowledge the wrongs committed against the Indigenous peoples of Canada; includes restoration of traditional land, recognition of culture lost at the hands of residential schools, and the political sovereignty of Indigenous peoples.

Research Ethics Board: A committee that applies research ethics by reviewing the methods proposed for research to ensure that they are ethical. Commonly found in universities and health institutions, and used in any research sector that has human participants.

Social determinants of health: Social determinants of health are the circumstances in which people are born, grow up, live, work, and age. This also includes the systems in place to offer health care and services to a community. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics.

Social impact bonds: A Social Impact Bond (SIB) is a pay-for-performance contract in which the government agrees to pay for improved social outcomes. A partnership between investors, service delivery organizations, and the government is established to tackle a specific social issue. The government repays the investors with interest only if the program meets its outcome targets.

Social purpose investors: Those who seek market-driven opportunities for profitable businesses based on services or products that solve real problems. They share a willingness to take a lower financial return in exchange for their financial investment risk as they look for new innovative solutions to complex social and/or environmental issues that can be scaled in a significant way to maximize benefit for society.

Soofa: A Cambridge-based startup with the goal of using sensor data collected by urban furniture to help cities with planning. Their products include Soofa Benches, which are solar-powered charging stations for phones that provide free Wi-Fi. The bench captures "anonymized" data from Wi-Fi enabled devices.

Tactical urbanism: A low-cost, citizen-driven approach to community building that involves spontaneous, low-tech alterations to public spaces to improve their quality, communicate a message, or maybe even get people talking to each other about something important.

Tax-increment financing: Governmental or quasi-governmental entity that raises bond debt from private investors on the condition that proceeds are invested to make improvements in a specific district. The debt holders agree to be paid back only out of the incremental tax, fee, or other revenue generated out of the district.

Third-party financial feasibility assessment: A study prepared by an entity independent of the entity that commissioned the study that evaluates the financial plausibility of a program or policy under a set of circumstances.

Vertical mixed use: Having public amenities such as parks, shops, and cafes mixed into higher levels of a building.

APPENDIX A: ABOUT THE FELLOWS

Althea Wishloff

Originally from Vancouver, I moved to Toronto in 2016, where I now work at a seed-stage venture capital fund. I joined the Fellowship to bridge my experience in community development with my desire to craft Quayside into a profitable, entrepreneur-attracting, and equitable community.

I am of Gitxsan Nation heritage, so Indigenous engagement is a cause close to my heart, and something I wanted to see brought to life through Quayside's civic engagement process. I also wanted to use this Fellowship to learn the mechanics of how municipalities could use innovative financing mechanisms to achieve their goals. I believe a smart city has the capacity to not only be equitable and inclusive, but also revenue-generating, and I want this realized through the Sidewalk Toronto partnership.

In my spare time, I can be found cycling around the city, drinking too much coffee, and spending time with my awesome siblings. Also, Toronto's parks are great — thank you, green space! Vancouver had long been my home, but Toronto has quickly become home too.

Arnel Espanol

I graduated from the Department of Architectural Science at Ryerson University just as we began our journey. I was born and raised next door in Mississauga, where my family started a new life after emigrating from the Philippines during the 1970s. Having lived in Toronto during my four years of studies, I'm glad to have regrown roots in the city.

Each academic year, I took on several extracurricular design-build projects that were installed on campus and around the city. The most recent project I completed was NEST, a warming station that stood for a month on Woodbine Beach as part of the 2018 annual Winter Stations International Design Competition.

Design innovation is the driving force behind seeking a spot in the Fellowship. My favourite part of the Fellowship was seeing unfamiliar methods in design, fabrication, and construction in the cities we visited over the summer. I am excited to see these new ideas reimagined and made real at home in Toronto. One of my aspirations is to operate a design studio / digital fabrication lab where I can test and build things for the public.

Betty Chang

Hailing from North York, I'm a researcher in public and social sector innovation, and a B.Sc. graduate of McGill University. I've strategized and implemented technology-enabled health and social services at Toronto Public Health and at the United Nations Children's Fund. Previously, I interned at Intel as a product manager on their consumer security team, as well as with the World Health Organization developing global maternal and child health policy recommendations.

As a Fellow, I'm interested in how urban innovation and open data can help build equitable services, infrastructure, and policies inclusive to all of Toronto's diverse residents and communities. What excites me most about the Fellowship is the opportunity to meet fellow Torontonians and hear their unique perspectives along this journey.

Outside the office, I'm a proud volunteer with Planned Parenthood, and an avid runner, foodie, and coffee connoisseur.

Candice Leung

I join the Sidewalk Toronto Fellowship Program as a passionate urbanist. I take pride in advocating progressive community planning that celebrates all the best parts about Toronto.

I have always had a committed interest in the betterment of my community, which is why I promote civic engagement in several grassroots organizations in Toronto. I have taken leading roles coordinating community events, managing independent studies, and supporting initiatives related to food security, transit accessibility, municipal affairs, and public space design. While completing my undergraduate degree, specializing in Urban Planning, I was also an active voice for climate and social justice. I presently live in Scarborough, splitting my time between furthering my education, volunteering, and supporting project engagement with the planning and urban design team at DIALOG.

Carol Yeung

It has been a pleasure to work as a Fellow this summer. I've learned so much about sustainability, the issues surrounding technological integration, and the challenges that come with collecting data in urban spaces. I'm highly interested in the idea of implementing systems that allow residents to control the digital layer around them and which are user-friendly enough to ensure all groups in the community are represented and can contribute to continual growth and change in the Quayside community.

I am currently studying Industrial Engineering at the University of Toronto and reside near the heart of downtown. Having lived in the suburb of North York as a child, I have called Toronto home for my entire life. Having also completed several technology-related internships in the past few years, I hope that my cumulative experiences can help give me perspective to guide recommendations for Quayside.

As an ex-competitive figure skater, I enjoy active hobbies like running, dancing, and ultimate frisbee. I also like to try cooking new savoury dishes in my spare time and hope to one day overcome my baking ineptitude. I am also the proud caretaker of two turtles.

Hana Brath

I am a born and raised Torontonian who is proud of my east end roots. I grew up in Leslieville before later moving to Riverdale, where I currently reside. I am excited to explore new plans for the waterfront, having spent countless summers biking up and down the waterfront, the Don Valley, and the Leslie Spit.

I am presently a Health Sciences student at McMaster University in Hamilton, and previously studied contemporary art at Etobicoke School of the Arts. I hope to combine my health and design backgrounds to learn how the design of a neighbourhood can promote health in the city. With Toronto's increasingly diverse healthcare needs, I would also like to explore ways that new technologies and unique data sources can be applied to support Toronto's healthcare infrastructure and better inform urban health practices. I have spent the past few summers researching opportunities to optimize the health of older adults at Women's College Hospital. I am excited to continue exploring health equity using different perspectives.

In my spare time, I enjoy playing ice hockey, hiking, petting dogs, and drinking coffee.

Helen Ngo

Toronto has given me the opportunity to chase dreams and find wonder, and I'm thankful for everything the city has given me over the past two years here. It has been an honour to be part of the Sidewalk Toronto Fellowship as a data scientist, poet, mathematics graduate, and advocate for women in STEM (Science, Technology, Engineering, Mathematics). I'm passionate about enabling large-scale machine intelligence in production, ethical data science, intersectional feminism, and spoken word poetry.

Outside of work, I co-organize the Toronto Women's Data Group and serve on the steering committee of the Toronto Deep Learning Series. Previously, I've volunteered with a deep learning meetup lab and served as an editorial associate for Towards Data Science. Sidewalk Toronto has challenged me to take on thoughtful conversations around data policy, differential privacy, the technologist-urbanist divide, and machine intelligence for good.

I'm a firm believer in the potential at the intersection between art and science, and that human concerns outweigh technological ones. I am hopeful and excited for Toronto's talented technology community to bring their vision and enthusiasm to Quayside.

Keisha St. Louis-McBurnie

Born and raised in co-operative housing in Cabbagetown-South St. James Town, I have spent 21 years of my life in a community that is vibrant, affordable, and thriving. I am currently an undergraduate student specializing in urban studies and majoring in political science at the University of Toronto. As Housing Lead for the Toronto Youth Cabinet (TYC), I have worked to create a more equitable, accessible, and youth-friendly city of Toronto through advocacy and policy development shaped by lived experience. I spent this past summer in the Ontario Public Service as a research assistant in the Ontario Cabinet's Executive Council Office, and am now an intern at Social Planning Toronto.

In the context of our city's widening disparities, I believe that we must ensure that Quayside will be a model for equitable and inclusive mixed-income neighbourhood development. As a Sidewalk Toronto Fellow, I am excited to explore how we can alleviate affordable housing challenges in Toronto with technological and infrastructural innovation and cross-sector partnerships. As an urbanist who is passionate about inclusive city-building practices, I would also love to create place-making opportunities for marginalized and equity-seeking communities along the waterfront.

Paul Seufert

I was born in Ottawa, and I moved to Toronto four years ago for school. I am currently finishing my degree in engineering science at the University of Toronto, where I am focusing on operations research and decision making. Between my third and fourth years of school, I worked for 14 months at ZS Associates, a global leader in data-driven sales and marketing consulting. Prior to my time at ZS, I was a research fellow with University of Toronto's iCity research group, where I investigated procedural modelling tools as a way to help communicate elements of smart city design to policy makers. After graduation, I will be joining the Boston Consulting Group.

As a Fellow, I was most interested in investigating how to empower the residents of smart cities. I am a firm believer in the power of decentralized decision making, and it is extremely important to me that Quayside always gives its residents choice. This includes providing a wide range of housing typologies to meet affordability and accessibility requirements, designing flexible public spaces that can be adapted for any use by local communities, and ensuring that residents can both understand and consent to their interactions with technology.

Sachin Persaud

A lifelong resident of north Scarborough, I am currently a graduate student in the School of Urban and Regional Planning at Ryerson University. In concurrence with the Sidewalk Toronto Fellows program, I completed an internship at the City of Toronto Planning Division where I provided support for an update to the Green Roof Bylaw. I have also completed internships with Infrastructure Ontario and multiple ministries in the Ontario Public Service. My graduate research is a policy review of the City of Toronto's Imagination, Manufacturing, Innovation and Technology (IMIT) property tax incentive program for employment-related development.

Public policy and governance are passions of mine. I am participating in Ryerson Leadership Lab's Can Study US Tour where I will be travelling to Chicago to meet with political candidates, campaign strategists, policy advisors, and journalists ahead of the hotly contested US midterm elections. My professional dream is to become a White House speechwriter. This stems from a desire to connect with ordinary people where they are and ultimately, to inspire them. I bring that same desire to the Fellows program; I want to make the complex elements of this project and its implications understandable to the everyday Toronto resident.

Sharly Chan

I am a graduate student at the Faculty of Information at the University of Toronto with a specialization in critical information policy studies. I examine the social impact of technology and its governance. I have worked as an analyst to review the ethics and accountability of artificial intelligence in the public sector in Ontario. I have also held research positions that range from increasing digital policy literacy for youth to examining the surveillance of civil society groups in Canada.

As a Fellow, I'm interested in critically engaging with Sidewalk Toronto's data strategy, particularly with data governance and ownership. I want to ensure that privacy, security, and transparency practices exceed current legislative and industry requirements to work in the public interest.

Outside of my studies, I'm a Junior Fellow at Massey College in the University of Toronto and a proud member of Civic Tech Toronto, a diverse community of Torontonians interested in finding solutions to civic challenges through technology and design. Since moving to Toronto for my studies, I have lived in the Annex, Chinatown, Seaton Village, and the Church-Yonge Corridor. In my spare time, you can find me exploring the city on my bike, practising martial arts, learning how to play guitar, and discovering hidden gems for great food.

William Sutter

Having grown up in a mixed-income community in Toronto's inner suburbs, I know that affordable housing, with access to reliable public transit, are key elements of intergenerational mobility. As a Fellow, I'm keen on exploring how to work across sectors to get stuff done. I want to dive deep into what makes a great public-private partnership in the financing, delivery, and management of infrastructure and social services.

I graduated with a Bachelor of Arts from Wilfrid Laurier University. I'm currently a Policy Analyst in Ontario's Ministry of Infrastructure where I provide advice to help the Province make evidence-based investment decisions. Previously, I worked in the Ministry of Economic Development and Growth where I supported the devel-opment of Ontario's first social impact bond. I've also held research positions studying policy innovation and open government.

I was born and raised in Scarborough and currently live in North York. I can be found hanging out in Trinity Bellwoods Park on a hot summer's day, on a dance floor in the Church-Wellesley Village, and at local coffee shops around the city.

APPENDIX B: DETAILED PROGRAM DESCRIPTION

ORIENTATION PROGRAM: APRIL 25-26, 2018

The Fellows met for the program orientation on April 25 and 26, 2018. The objective of the orientation program was to introduce and explain the program structure, and to give the Fellows an introduction to Toronto's waterfront and the Sidewalk Toronto project.

Saturday, April 25

Introduction to Fellows Program
Peter MacLeod

Fellows were introduced to the program structure and trip itineraries, as well as how to the process for drafting the final report.

Introduction to Sidewalk Toronto
Megan Wald (Sidewalk Labs) and Aaron Barter (Waterfront Toronto)

Representatives from Sidewalk Labs and Waterfront Toronto provided a basic overview of the project to date, including each organization's mission and goals, current issues in Toronto that the Quayside project is responding to, and broadly what the vision of Sidewalk Toronto is for Quayside.

History of Toronto's Waterfront
Michael Noble, Waterfront Secretariat

Michael Noble introduced the Fellows to a history of Toronto's industrial waterfront history, and provided an overview of current waterfront revitalization projects that have been recently completed or are underway.

Tour of Quayside and Eastern Waterfront
Mira Shenker and Louroz Mercader, Waterfront Toronto

The Fellows took a short tour of the Waterfront with representatives from Waterfront Toronto, starting at the WaveDeck, and viewing Sugar Beach, Quayside, and finally the Port Lands.

Sunday, April 26

Panel on Toronto Issues
Ken Greenberg, Adriana Beemans (Metcalfe Foundation), Pamela Robinson (Ryerson University)

Local experts in urban planning and development held an hour-long panel and discussion with the Fellows to discuss their impressions of what important issues face Toronto today, and what role "smart city" technology could play in addressing those issues.

Deep dive into Sidewalk Toronto Pillars
Megan Wald (Sidewalk Labs), Marie Buckingham (Sidewalk Labs), Steven Turell (Sidewalk Labs), John Wittrock (Sidewalk Labs), Jeff Ross (Waterfront Toronto), Pina Mallozzi (Waterfront Toronto), Michael Wolfe (Waterfront Toronto)

Representatives from Sidewalk Labs and Waterfront Toronto presented more information on the different pillars of the Sidewalk Toronto project and the current objectives and vision for each pillar.

Trip Preparation

The orientation program ended with a more detailed overview of the itinerary and planned meetings for each trip, with more focus on the upcoming Europe trip.

AMSTERDAM + COPENHAGEN + MALMÖ: JUNE 3-8, 2018

June 3

Canal Tour and Introduction to Amsterdam
Those Dam Boat Guys; Joeri van den Steenhoven

The Fellows took a canal boat tour to learn about the history and layout of the city. They discussed the city's relationship to water by learning about the variety of activity and industries seen throughout the tour. The discussions evolved and touched on topics related to maintenance, ownership, and safety of the canals, as well as cycling culture. They were joined on the tour by Joeri van den Steenhoven, the former VP of Systems Innovation at MaRS Solutions Labs and founder of Kennisland, a Dutch foundation that supports innovation and systems change.

June 4

Bicycle Tour of Buiksloterham and Amsterdam-Noord
Tjeerd Haccou, Principal, Space&Matter

The Fellows travelled by bicycle and ferry to the neighbourhood of Buiksloterham in Amsterdam-Noord, which is a recently redeveloped former industrial waterfront neighbourhood. They met with Tjeerd Haccou from the design firm Space&Matter, and learned about several local projects the firm has been involved with, including De Ceuvel, and a floating neighbourhood called "Schoonschip." They visited a local condominium building with local architect Bart Aptroot, and learned about recent attempts to make Buiksloterham a "circular economy."

De Ceuvel
Metabolic

De Ceuvel is a clean-tech neighbourhood in Amsterdam North constructed from restored houseboats on previously contaminated industrial land. The site is home to a variety of technology firms and social ventures, including Metabolic, a research and consulting company focused on sustainability. After a tour of the site, Metabolic delivered a presentation to the Fellows about Jouliette, a blockchain-based decentralized energy model which enables citizens to share their locally produced renewable energy.

MX3D
Gijs van der Velden, MX3D

MX3D is a digital fabrication company that is developing a new technology to enable robotic 3D printing for use in construction. They are working specifically with metal, and are in the process of 3D printing a bridge that will be placed over a canal in downtown Amsterdam. The Fellows listened to a presentation about the company's approach, milestones, and technology, and toured the studio to see the 3D bridge printing in-progress.

Houthavens and Superlofts
Antonia Nieto, Urban Designer, City of Amsterdam and David Tol, Marc Koehler Architects

The Fellows travelled by bicycle and ferry to the Houthavens neighbourhood across the harbour from Amsterdam-Noord. Similar to Amsterdam-Noord, Houthavens is a new waterfront neighbourhood built on a former lumber port. After discussing the strategy behind the redesign of the site with local planner Antonia Nieto, architect David Tol took the Fellows inside the Superlofts residential development to demonstrate the flexible, customizable designs of the units.

Conversation with Chief Technology Officer of Amsterdam
Ger Baron + Team

The Fellows met with the municipality's CTO, Ger Baron, and members from the Technology Office. The Office leads smart city projects in collaboration with other municipal departments and the private sector. The Fellows discussed some of the municipality's past and current projects, the role of the technology office, and how Ger and his team are working to encourage a culture of innovation and public-private collaboration within City Hall.

June 5

Waag Society
Ivonne Jansen-Dings, Head of Programme, Smart Citizens Lab, Job Spierings, Program Manager, and Taco van Dijk, Software Developer

The Fellows spent a morning with Waag Society,

a non-profit foundation that works with grassroots and institutional partners on research and projects that explore how to "make technology and society more open, fair and inclusive." Ivonne Jansen-Dings led the Fellows on a tour of Waag's design lab, wet lab, textile lab, and fabrication lab. Following the tour, the Waag team gave a presentation to the Fellows on the mission of the foundation and the work they do. One of their primary projects is called DECODE, a new project to help give people more information and choice over what personal data is available online, and how it is used.

Discussion on Affordable Housing in Amsterdam
Elly van Sluijs, Team Coordinator Corporations & Tenants & Resident Support, City of Amsterdam and Andrej Badin, Assistant Landscape Architect, City of Amsterdam

The Fellows met with several public servants in the City of Amsterdam to discuss Amsterdam's approach to providing affordable housing. They began by exploring pressing housing issues in Amsterdam including the impacts of growing income inequality and the role of gentrification in creating segregation. The City of Amsterdam also outlined their Housing Agenda 2025 plan to build and maintain new social and middle-rental housing, counterbalancing market forces and creating new mixed-income neighbourhoods.

June 6

Bicycle tour of Copenhagen cycling infrastructure
James Thoem, Urban Designer, Copenhagenize.

Copenhagenize took the Fellows on a morning bicycle tour of Copenhagen. Host James Thoem highlighted the variety of cycling infrastructure the city has that celebrates and complements its cycling culture. Together, they rode along different types of bike lanes and across non-vehicular bridges, taking in the sights and design of the city. Seeing comprehensive bike lane networks and strategically designed cycling infrastructure led to larger discussions following the tour about how cities can better support and encourage active transportation.

Meeting with Copenhagen Chief Architect
Tina Saaby, Chief Architect, City of Copenhagen

The Fellows met with Copenhagen's Chief Architect, Tina Saaby, to discuss Copenhagen's approach to urban design and planning. Tina spoke with the Fellows about topics ranging from Copenhagen's cycling infrastructure to their attitudes towards social housing. She highlighted Copenhagen's unparalleled approach to enabling widespread access to public parks and spaces.

Meeting with Copenhagen Culture and Leisure Mayor
Niko Grunfeld, Copenhagen Culture and Leisure Mayor

Mayor Grunfeld gave the Fellows a presentation on Copenhagen's cultural landmarks and traditions. He spoke at length about what motivated him to get into politics, the value of a strong city identify, and Copenhagen's culture relative to arts, food, and cycling.

Meeting on Approaches to Transportation in Copenhagen
Steffen Rasmussen, Manager of Traffic and Urban Life, City of Copenhagen

The Fellows met with Steffen Rasmussen to discuss innovations in transportation demand management and vehicles. Rasmussen gave a presentation on the work undertaken by the Technical and Environmental Department. He spoke about his own work experience relative to streetscape design, carbon-neutral commitments, vision zero, and subway extensions. Rasmussen also explained Intelligent Transport Systems (ITS) which utilize the potential of technology to improve road safety and urban mobility.

Meeting at Danish Parliament
Uffe Elbaek, Member of Parliament, Leader of The Alternative Party

The Fellows ended the day with a discussion and question and answer session with Uffe Elbaek, leader of Danish national party The Alternative. Uffe shared his thoughts on public engagement and how to build a more inclusive and productive political culture. He also talked about the work of The Alternative, which seeks to challenge the current global economic order of "growth" by creating a society — and world — that is environmentally, politically, economically, and socially sustainable.

June 7

Bicycle tour of waterfront
Sophia Schuff, Urban Anthropologist, Gehl Design

Sophia led the Fellows by bicycle on a tour of Copenhagen's waterfront, discussing projects like the cyclist bridges, the wave deck, public baths, and waterfront condo developments. She spoke at length about the importance of human centric design, citing a "measure, test, and refine" design approach. Throughout the tour, the Fellows engaged in discussions about waterfront housing affordability, public realm, and ways of measuring a project's impact on urban life.

Tour of Western Harbour neighbourhood in Malmö, Sweden
Lotta Hansson, City of Malmö

The Fellows learned about the evolution of Malmö's waterfront from primarily industrial uses to mixed uses following the decline of the shipbuilding industry. They then toured the Western Harbour neighbourhood, built in the early 2000s, that has become Sweden's first carbon-neutral neighbourhood.

BOSTON + NEW YORK CITY: JULY 11-14, 2018

July 11

Biobot
Newsha Ghaeli, President & Co-founder, and Erin Winslow, Head of Partnerships and Business Operations

The Fellows met with Biobot, a startup using wastewater epidemiology to tackle urban health problems. Currently, their robotic collection systems in city sewers are helping governments more accurately understand and address the opioid epidemic. The Fellows discussed the costs benefits and implications of new data sources from waste water to inform city systems. Topics relating to data governance and the impact of aggregate-level data on privacy were discussed at length.

Senseable City Lab - MIT
Erin Schenck, Assistant Director, and Ricardo Alvarez, Researcher

The Fellows visited Senseable City Lab at MIT to learn about ways the lab is exploring intersections between people, cities, and technology. At Senseable, interdisciplinary teams take on city issues from a design and science perspective. The Fellows reviewed several research projects, including the Minimum Fleet Network on rideshare optimization in New York City, and Roboat, a pilot on self-driving boats in Amsterdam. They discussed challenges and opportunities for government, academia, and citizens to collaborate on city issues.

Mayor's Office of New Urban Mechanics
Jaclyn Youngblood, Program Director, MONUM, Nigel Jacob, Co-Director, MONUM, MONUM staff

Representatives from MONUM met with the Fellows to discuss their novel approach to citizen engagement and innovation. This office works across departments to explore, experiment, and evaluate better approaches to civic life. In an open forum setting, the Fellows learned about past MONUM projects and the impact of their results. Discussion evolved around public engagement, tech literacy, the difference between a pilot and a prototype, and the office's role in supporting public trust.

Rose Kennedy Greenway
The Fellows walked along the Rose Kennedy Greenway, which is a linear park at grade built overtop the John F. Fitzgerald freeway following Boston's "Big Dig." The Fellows walked along the Greenway from Hanover Street to Seaport Blvd, taking note of the different public space amenities, art installations, and animating features of the linear park.

July 12

Visit to Roosevelt Island and Cornell Tech
Andrew C. Winters, Chief Operating Officer, Development (Sidewalk Labs)

The Fellows travelled by tram to Roosevelt Island to tour the site and explore Cornell Tech. They were greeted by Andrew Winters, who was the former Director of Capital Projects and Planning for Cornell Tech and who worked at Cornell through most of the campus's development. Andrew gave the Fellows an overview of the Island's history as a neglected site for a jail and hospital. He then explained the planning

and design approach for the Island and the development of Cornell Tech as a design competition. The Fellows toured the campus and discussed topics such as public access, complete community planning, and environmental sustainability.

Tour of Governor's Island
Friends of Governor's Island

The Fellows toured Governor's Island, a former military base that has been redeveloped into a public park. The Friends of Governor's Island is a non-profit that manages the island and development. Representatives from Friends of Governor's Island gave the Fellows an overview of the Island's history and its vision moving forward. The Island is presently only accessible by ferry during seasonal times of the year and offers scenic views of surrounding cities and landmarks, such as the Statue of Liberty. The site features public art, programming, and outdoor space. The Fellows toured the urban farm, Hammock Grove, and The Hills — human-made hills that are built from clean infill and double as a flood protection measure for the island. Throughout various stages of the tour, the Fellows engaged in discussion about the planning, design, and financing of the island.

Discussion and Visit to World Trade Centre Site
Regional Plan Association

The Fellows visited the Regional Plan Association to learn about the history of the process of redesigning the World Trade Centre site after September 11, including how the RPA engaged citizens in building public support for the new site design. The Fellows then toured the site and discussed the different design choices on the site and how the city acknowledged and memorialized the disaster while also focusing on rebuilding New York City's public infrastructure.

Tour of Brooklyn Waterfront
Josh Sirefman, Head of Development, Sidewalk Labs

Josh Sirefman led the Fellows on a walking tour of the Brooklyn Waterfront, discussing his experience working on expanding the Brooklyn Bridge Park while at the Economic Development Corporation. He described the innovative funding model that underpins the project and the strategic design utilized by the old piers of the waterfront. At the end of the tour, he held a general Q&A session with the Fellows, where they discussed Sidewalk Toronto's proposal for Quayside.

July 13

Walking tour of High Line
Patrick Hazari, Director of Design and Construction, Friends of the High Line

Patrick Hazari led the Fellows on a tour of the High Line, describing the process of how the High Line was saved from demolition and developed into a park. The Fellows then learned about the role that the Friends of the High Line, a non-profit organization, has in managing the park. In this discussion, the Fellows posed questions about the significance a linear park has had on dense lower Manhattan, and the impacts on proximal neighbourhoods as the High Line has become more popular. Throughout the tour, Patrick noted points of interest and the general organization of the park into different "rooms."

Presentations and Discussions with Sidewalk Labs Pillar Leads
Rohit Aggarwala, Head of Urban Systems, Charlotte Matthews, Director of Sustainability, Craig Nevill-Manning, Head of Engineering, Karim Khalifa, Director, Buildings Innovation, Jesse Shapins, Director, Public Realm, Joanna Lack, Interim Head of City Operations

Sidewalk Labs pillar leads gave the Fellows brief updates on the Quayside proposal pillars and took questions. Some of the topics explored included: leveraging tall timber construction, creating a climate positive community, reimagining the public realm as shared space for the community, the role of digital infrastructure in a neighbourhood, increasing urbanity with mobility, and the importance of health and well-being in Quayside.

Lunch and "Ask Me Anything" with Sidewalk Labs staff
Various Sidewalk Labs staff

The Fellows split into three groups and had lunch with Sidewalk Labs staff. The groups were focused on finance, development and planning, and technology. This was an opportunity for the Fellows to ask questions about specific topics that interested them. It also allowed them to gain a more contextualized understanding of Sidewalk Labs and the different pillars of the company.

Q&A with CEO of Sidewalk Labs
Dan Doctoroff

The Fellows had an hour-long question and answer session with Dan Doctoroff, CEO of Sidewalk Labs. Topics of discussion ranged from the importance of scale for achieving ambitious social and environmental goals, to Sidewalk's role as a "master-enabler" of civic innovation, and Toronto's opportunity to set a global standard for the responsible use of data.

Product Demonstrations with Sidewalk Labs
Ananta Pandey, Software Engineer, Violet Whitney, Associate Director - Design, John Wittrock, Senior Software Engineer, Alyssa Harvey Dawson, General Counsel and Head of Legal, Privacy and Data Governance, Marie Buckingham, Associate Product Manager

The Fellows met with engineers and product managers from Sidewalk Labs to explore products where civic data is used to provide insight on opportunities for optimization in the city context. Replica is a dashboard powered by simulated data on transit and movement, with a data distribution which matches that of the actual city. This allows planners to understand the way that citizens choose to get around while obscuring personally identifiable details. The Generative Design project provided the Fellows with insight on novel algorithms which could optimize city planning based on constraints set by planners (e.g., amount of shadow, tree space, etc). This work is meant to augment that of designers and architects. The Fellows also discussed nuances around data ownership and residency, including legal implications and possible mitigation plans.

VANCOUVER: JULY 29-31, 2018

July 29

Walking Tour of Gastown and Chinatown
Tour Guys

The Fellows took a walking tour of Gastown and Chinatown and learned about the history of Vancouver's development as a large urban centre, as well as recent attempts to build more affordable housing downtown while addressing issues of inequality and gentrification.

Transit Discussion
David Cooper, Translink

The Fellows spoke with David Cooper about the issues and challenges with planning and building public transit projects in Vancouver, as well as how the city works to engage the public around transportation planning. David Cooper shared his experiences working as a transportation planner in three Canadian municipalities.

July 30

Meeting with City Councillor
Andrea Reimer, City Councillor, Vancouver

The Fellows met with Councillor Reimer for a general question and answer session about Vancouver's approach to city planning, public engagement, reconciliation with Indigenous peoples, and how the city's councillor-at-large representation model impacts politics and decision-making. Councillor Reimer touched on her own legacy as a city councillor, citing her experiences creating the Downtown Eastside Plan as well as exploring innovative strategies to build more affordable housing.

Walking Tour of Olympic Village
Karis Hiebert and Andrew Pask, Planners, City of Vancouver

The Fellows had a walking tour of the Olympic Village development with city planners. They learned about how the neighbourhood was designed for a mix of uses and incomes, and how the space was specifically designed to help re-engage the public with the water's edge.

Tour of Granville Island
Lisa Ono, Manager, Public Affairs & Programming, CMHC-Granville Island

After walking the length of the waterfront from Olympic Village to Granville Island and observing some of the older housing developments along the route, the Fellows had a brief walking tour of Granville Island. They learned about how the community has encouraged the growth of a vibrant arts and retail community using a dynamic leasing model. They also discussed the Granville Island 2040 Vision project, and then had some spare time to walk around the island and look at the many art exhibits and public space amenities.

Walking Tour of Yaletown and Northeast False Creek
Holly Sovdi, Planner, City of Vancouver

Holly Sovdi took the Fellows on a tour of Yaletown and along the waterfront towards Northeast False Creek, where a new waterfront community development has just been approved. He discussed at length the different considerations for how the neighbourhood was designed, including the impacts that the imminent removal of the Georgia Street viaducts will have on the public's access to the waterfront. He also outlined the project's public engagement process, with particular emphasis on how the City worked to ensure the Indigenous community's needs were met. He also shared how the city worked with the African and Chinese communities concerning Hogan's Alley, a low-income and ethnically diverse community that was demolished in the 1970s to build the viaduct.

July 31

City Studio
Host: Janet Moore, Co-founder, City Studio

The Fellows met in the morning with Janet Moore, co-founder of City Studio, a program that embeds students in government departments to pilot-test new place-making and urban innovation projects to address a variety of urban challenges. They learned about the Studio's methodology and approach, and discussed some of the specific experiments that have emerged from the studio, including IllumiLane, Colouring Cambie, Tea Talk, and Keys to the Streets.

Indigenous Engagement Discussion
Spencer Lindsay, Indigenous Engagement Specialist, City of Vancouver

The Fellows learned about Vancouver's approach to Indigenous engagement. They discussed a recent case study of the city's renaming of two public plazas. Spencer Lindsay discussed his experience working with chiefs and councils, and advised the Fellows on how to ensure the right timing for engagement. The group also discussed the concepts of more centralized ("discrete") and decentralized ("diffuse") forms of acknowledgement (i.e., having one single monument in one area vs. having artifacts and acknowledgements of Indigenous history spread throughout an area).

Meeting with Catalyst Community Developments Society
Stephanie Allen, VP Project Planning and Development, and Rob Purdy, Chief Financial Officer

The trip ended with a meeting with Catalyst Community Developments Society where Stephanie Allen explained the company's approach to building affordable housing in Vancouver. As a non-profit real estate developer, Catalyst works to create communities where residents spend no more than 30 percent of total household income on rent and have access to vibrant community spaces. They start by identifying community needs and assets, and partner with mission-aligned investors, organizations, and municipalities to create a more affordable British Columbia.

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RECOMMENDATIONS

1. Set ambitious low- and mid-range affordable housing targets

2. Provide affordable housing at Quayside in perpetuity

3. Establish an Affordable Housing Fund to champion, finance, and operate housing at Quayside

4. Prevent the "Disney-ification" of Quayside

5. Explore the future of affordable, ground-level retail in Quayside

6. Establish and democratize a carbon-neutral neighbourhood energy public utility program

7. Expand the capacity of our current transit network to and from Quayside

8. Ensure that cycling, walking, and public transit are always faster, more reliable, and more convenient than driving

9. Catalyze active transportation through better design that promotes safety, comfort, and delight

10. Use Quayside to demonstrate a reduced need for private vehicle ownership in the City of Toronto

11. Partner with Indigenous communities in the planning, design, and lived experience of Quayside

12. Experiment with innovative financing tools and partnership models to build infrastructure and deliver services

13. Establish a living laboratory for urban planning and civic technology experimentation

14. Explore new governance models for the adjudication of land-use planning conflicts that occur at Quayside

15. Establish an independent data trust for all data collected in Quayside to ensure strong data stewardship

16. Create and maintain an open data portal to encourage innovation for the public good

17. Collect data to build community trust and empower public good

18. Address meaningful consent and its impact on public spaces in the Master Innovation and Development Plan

19. Advocate all-ages data literacy through hands-on educational initiatives integrated with Toronto's existing technology community

20. Set a new standard for inclusive, transparent public engagement across all phases of Quayside design, planning, and development

21. Build flexible spaces that individuals can design and continuously adapt to their needs and wants

22. Create an integrated, mixed-use neighbourhood that promotes community health and well-being

23. Infuse public art into the built environment that provokes awareness, education, and action

24. Share learnings by publishing a design guide that informs, inspires and empowers citizens and city builders

25. Maximize comfort and usability of outdoor public spaces for Toronto's rain and snow

26. Redefine our city's relationship with Lake Ontario by making it more visible and accessible

27. Equip public spaces to become an extension of a front and backyard

For more information visit
www.sidewalktoronto.ca