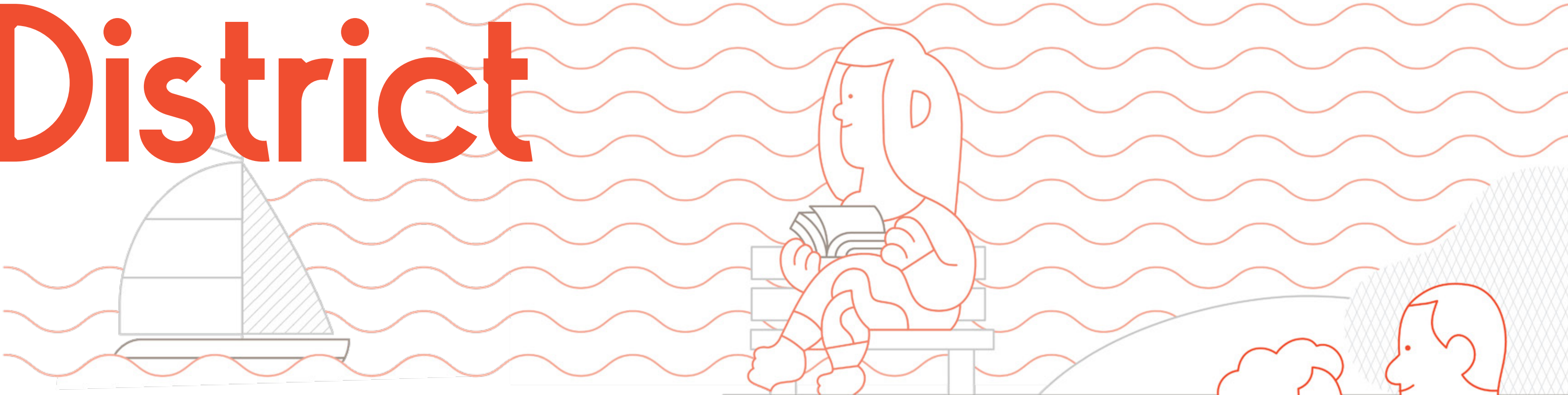
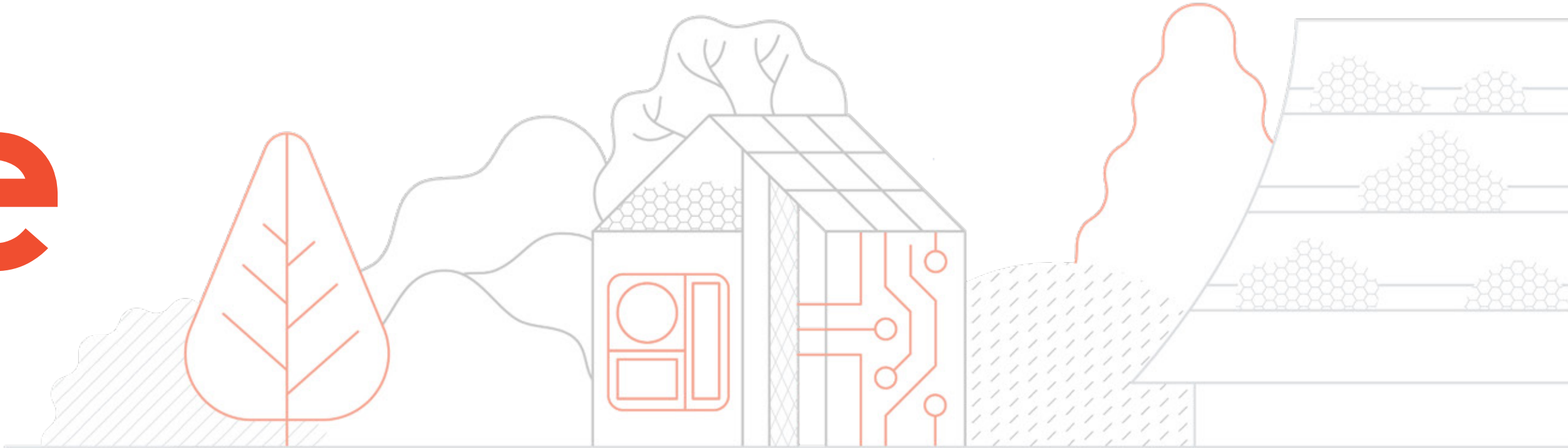


The River District



Introduction

p256

Part 1

Neighbourhood Planning Concepts

p292

Part 2

Scaling Urban Innovations

p348

The Future Is Now

p408



Planning Holistically to Achieve Toronto’s Goals

Extending Quayside’s innovations into the River District would enable Toronto to capitalize on existing public investments and leverage the significant proposed investments by Sidewalk Labs to fulfill the waterfront’s extraordinary potential.

For decades, Toronto’s planners have recognized the opportunity for the eastern waterfront to play a critical role in addressing Toronto’s challenges.¹

Yet despite the success of the Film District studios and the improvements to Cherry Beach, the area continues to have much greater potential to contribute to the fabric of the city than is currently being realized. While there has always been a general agreement that the eastern waterfront should have a strong focus on employment and jobs, unlocking that potential has been an ongoing challenge for decades.

An important step was taken when Waterfront Toronto and its government partners initiated the Don Mouth Naturalization and Port Lands Flood Protection Project Environmental Assessment, which considered how to eliminate a first barrier to development: flooding. The result was the \$1.25 billion Don Mouth Naturalization plan currently underway.²

As another important step, the Port Lands Planning Framework and Villiers Island Precinct Plan have established a vision to guide the transformation of the area over the next half century.³ The framework emphasizes the development of mixed-use neighbourhoods surrounding the renaturalized Don River and on the newly created Villiers Island to provide much-needed spaces for production, interactive, and creative jobs and for affordable housing, anchored by an expanded transit network and vibrant public spaces.

But even with the significant recent public investment, the area still lacks even basic infrastructure and remains separated from the great neighbourhoods that surround it to the north. Despite a shared recognition of the systems required to achieve

the eastern waterfront’s potential, such as new public transit lines, there is currently no clear path to funding and building them.

Drawing on its unique mission to integrate new technology and urban design to improve urban life, Sidewalk Labs proposes to work with Waterfront Toronto and the City of Toronto to develop innovative approaches, tools, and resources to deliver the necessary infrastructure to build on Toronto’s planning foundation and accelerate the realization of major policy objectives.

This partnership could fulfill the revitalization vision for the eastern waterfront with a focus on urban innovation, economic development, environmental sustainability, improved mobility and affordability, and social inclusion.

As described in the previous chapter of Volume 1, the opportunity begins in Quayside, which can become a globally significant demonstration project that advances a new model for sustainable and innovative urban development. Its relatively intimate scale presents a perfect environment to prove the viability of the proposed innovations.

But many of the innovations initiated in Quayside can only achieve their full potential and become financially feasible when applied at a larger scale. That is why Sidewalk Labs is proposing a second phase for the project across a larger geography it is calling the River District.

Together, Quayside and the River District form the basis of the Sidewalk Toronto project proposal to transform a small portion of the eastern waterfront — less than one third to be developed over 20 years — into an Innovative Design and Economic Acceleration (IDEA) District that can catalyze tens of thousands of jobs and help tackle the major challenges facing Toronto today.



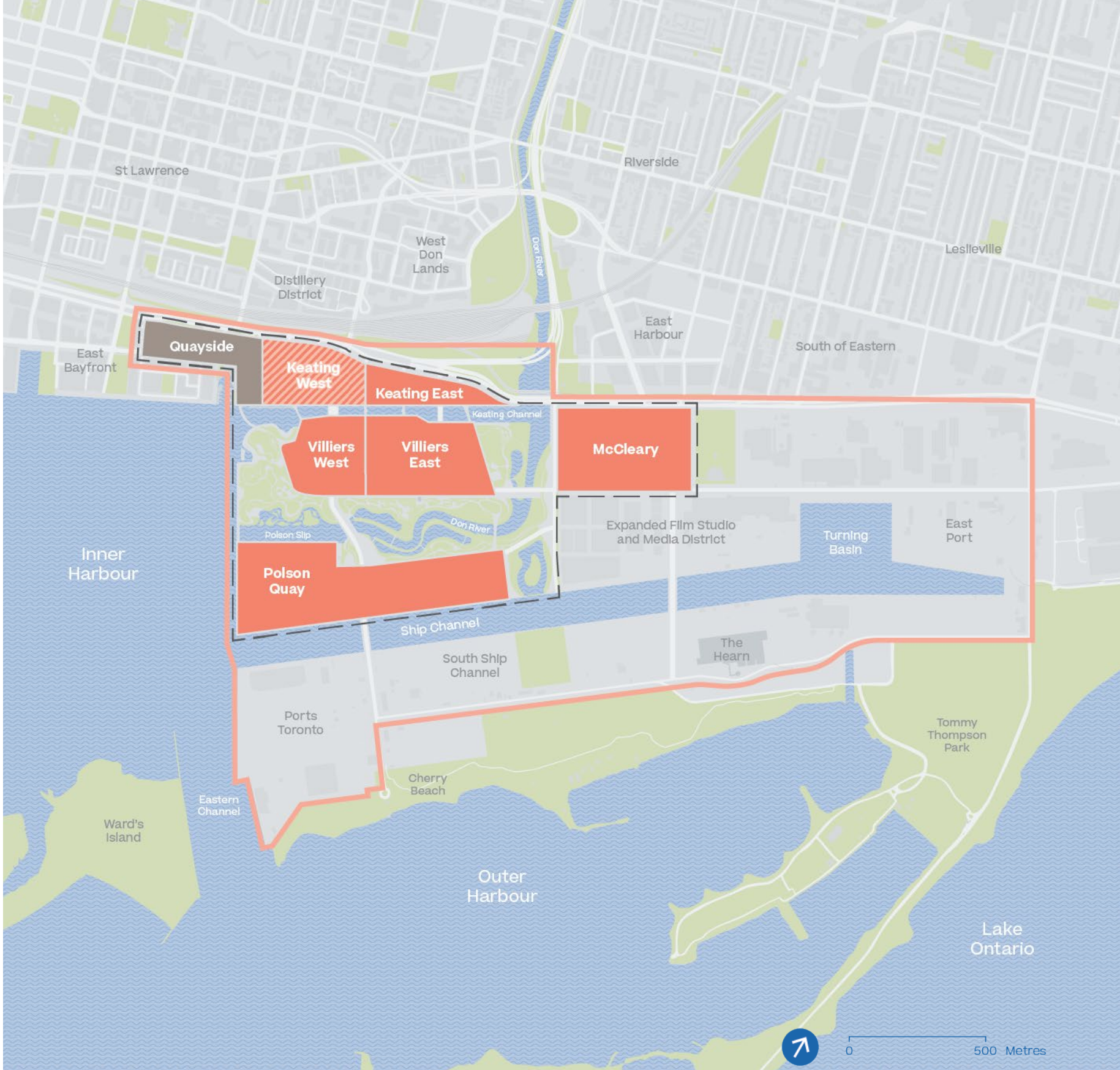
Unlocking the full potential of the underutilized eastern waterfront for inclusive urban growth has been a challenge for decades.
Credit: Mark Wickens

This limited geography recognizes that there are successful industries already in place that require their own spaces to expand. That is why the growing Film District is not included as part of the proposal. Neither is East Port, which is an important location for the consolidation and ongoing operation of larger industrial uses.

While the Film District and East Port are not part of this proposal, the River District development would seek to partner with them and support them where appropriate. Such efforts might include incorporating technology into the streetscape to facilitate film shoots or fostering research into green industrial practices that could benefit companies in the East Port.

The River District also does not include Keating West, which consists of two privately owned parcels that have already undergone precinct planning and had zoning bylaws adopted by council. These sites would, at their discretion, have the option to participate in the advanced sustainable infrastructure program proposed by Sidewalk Labs.

Sidewalk Labs' proposed role in development would also shift as the project expands into the River District; this role is described more in the following section, beginning on Page 260.



Map

The IDEA District and eastern waterfront geography

- Eastern waterfront
- - - IDEA District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2

The River District: Proposed geography and roles

The River District, a 62-hectare area just beyond Quayside that surrounds the naturalized Don River and ends at the Ship Channel, would consist of five neighbourhoods: Villiers West, Villiers East, Keating East, McCleary, and Polson Quay.

Collectively, these areas contain sufficient scale, density, and diversity to unlock opportunities for Waterfront Toronto and the city to fully realize shared objectives. While the specific plans developed by the responsible government agencies would respond to the unique potential of each neighbourhood site, collectively these communities can become a global showcase for a new kind of live-work-make model for urban life, driven by adaptable designs that can respond to the changing needs of future generations.

It is Waterfront Toronto's mandate to lead the urban planning, design, infrastructure delivery, and real estate development associated with broader geographies along the eastern waterfront. Sidewalk Labs proposes that government designate a public entity to serve — or in the case of Waterfront Toronto, continue to serve — as revitalization lead for the IDEA District.

Waterfront Toronto selected Sidewalk Labs as the partner best suited to achieve its objectives around economic opportunity, sustainability, mobility, and affordability. As a company founded to leverage the latest innovations to improve the quality of life in cities, Sidewalk Labs can bring together the expertise and tools required to devise, finance, and implement creative solutions to large-scale problems.

Sidewalk Labs believes that the best way to achieve Toronto's goal of creating an innovation showcase along the waterfront is by demonstrating leadership and empowering others to do the same. That is why a fundamental part of its plan is to create conditions that allow third parties to easily access, explore, adapt, and build on its ideas and technologies.

In one area of the River District, Villiers West, Sidewalk Labs proposes to be the lead real estate developer in concert with local development partners, with Google's relocated Canadian headquarters as the centrepiece, to create a major economic hub focused on urban innovation. In total, Sidewalk Labs proposes leading development (with local partners) only on Quayside and Villiers West — less than 7 percent of the eastern waterfront.



Map
**River District
geography
and roles**

- IDEA District
- River District
- Phase 1: Quayside
- Phase 2: River District
- Optional participation in Phase 2
- Sidewalk Labs develops real estate and advanced systems



For more information on proposed roles, see the “Innovation and Funding Partnership Proposal” chapter of Volume 3.

The proposed River District would create the conditions that enable third parties to develop urban innovations, unlocking improvements and solutions that are as yet unimagined.

In the rest of the River District, an array of third parties would take over the development, and Sidewalk Labs’ roles would include supporting Waterfront Toronto as the planning, design, and implementation partner (including the creation of innovation design standards and guidelines); deploying a core set of technology solutions required to achieve key project objectives; and financing infrastructure (an optional role). A mixture of public, private, and non-profit entities would develop buildings, create jobs, provide housing opportunities, and deliver social and community infrastructure.

Reflecting these roles, the River District chapter includes considerable planning details for Villiers West but only includes concepts for the other proposed River District neighbourhoods. This chapter also describes how each core innovation pillar initiated in Quayside generates greater quality-of-life benefits — and in some cases only becomes financially viable — at scale.

Sidewalk Labs believes that its unique approach to planning, supported by a new partnership model that harnesses the private sector’s ability to help realize public policy goals, would create the conditions that enable third parties to develop urban innovations, unlocking improvements and solutions that are as yet unimagined.

The River District’s Scale Is Necessary to Realize Priority Outcomes

Quayside’s five hectares make it a perfect place to explore new innovations to improve quality of life, but many can only become effective or financially feasible at the scale of the 62-hectare River District.

Waterfront Toronto has established five priority outcomes to guide the MIDP: job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance).⁴ Achieving these goals will require establishing strong economic anchors; building new public transit connections; designing, financing, and operating advanced infrastructure systems; and developing financial tools that can generate significant new value to help fund affordable housing.

These systems and approaches become feasible only when they are applied to an area large enough to support the substantial resources required to develop, implement, and run them. For that reason, several of the foundational innovations proposed in Quayside are possible only when they are designed and implemented in the context of the broader geographic area that includes the River District.



Proposed innovations that can only exist at scale

Many urban systems benefit from scale; more space can mean more amenities and more potential experiences. Some require scale to exist at all. They simply cannot be financed or successfully operated without a certain amount of density to support them. Here is a list of the innovations proposed in the MIDP that would only be possible at the scale of the River District, either for technical, financial, or operational reasons.

This list is introduced briefly here and described in greater depth in the sections that follow.

1 Attracting new economic anchors is only possible at scale.

→ **Urban innovation cluster.** A mixed-use development area with sufficient space and amenities is needed to attract an economic anchor that can generate significant jobs and establish an ecosystem of ongoing urban innovation.

→ **Factory-based construction.** A critical mass of construction is needed to catalyze a Canadian tall timber industry and justify investment in a modular production factory in southern Ontario.

2 Supporting advanced infrastructure to achieve climate positivity is only possible at scale.

→ **Climate positivity.** A sufficient development area and density are needed to finance and operate the advanced infrastructure systems core to creating a climate-positive community.

3 Unlocking significant progress towards affordability is only possible at scale.

→ **Affordable housing.** Sufficient development areas and densities are needed for new financial tools to ensure that developers can help support public goals around below-market housing, managed by a new housing trust.

4 Creating a 21st-century mobility network is only possible at scale.

→ **Public transit expansion.** A sufficient development area and density are needed to self-finance the construction of the planned public transit extensions — without competing with other city funding priorities.

→ **New mobility options.** Providing an area large enough to establish a full network of new mobility options is necessary to integrate new technologies and to improve and expand multiple modes, including public transit, walking, cycling, ride-hailing, and micro-mobility options.

1

Attracting new economic anchors

Sparking an urban innovation cluster.

Quayside can establish the foundation of a district that actively supports innovation, creativity, and exploration, but it does not have the space to accommodate an economic cluster's potential expansion or a sufficient density of housing, retail, and amenities to support tens of thousands of new workers and residents.

The River District presents this opportunity. Alphabet commits to establishing a new Canadian headquarters for Google on the western edge of Villiers Island, as part of an agreed-upon transaction within the IDEA District. **Alphabet would target up to 500,000 square feet, which would be sufficient to accommodate as many as 2,500 jobs, the majority of which would be for Google employees (though actual hiring would depend on market conditions and business requirements).**

This new headquarters would be the centre and catalyst for a new innovation campus, amplifying the area's economic potential. Based on experience in a variety of other cities, it is expected that the Google tenancy would attract an array of other companies in the Toronto tech ecosystem to locate at the innovation campus.

This campus would also include the Urban Innovation Institute, a new non-profit applied research institute designed to bring together academia, industry, entrepreneurs, advocates, and public agencies to collaborate on tackling urban challenges. The proposed institute would be developed with local universities and

government partners, with the idea of helping innovators access, contribute to, and export the learning made possible throughout Quayside and the River District.⁵

The innovation campus would be a major employment anchor for the revitalized eastern waterfront, complementing the Film District expansion and the East Harbour development. **In total, Sidewalk Labs estimates that 10,500 of the 93,000 IDEA District jobs would be focused on urban innovation, creating a new economic engine around this emerging area.**

Catalyzing a mass timber industry.

As the world's first entirely mass-timber neighbourhood, Quayside can help demonstrate the feasibility and benefits of this new sustainable building material. But Sidewalk Labs estimates that a larger development area — roughly 6 million square feet — is needed to justify an investment in the factory-based production of mass timber, as well as for such a factory to hit peak efficiency in producing sustainable building components on a predictable timeline that developers can trust.

Extending this approach across the River District could catalyze the creation of a new Canadian industry that capitalizes on the country's abundant green-certified forests, and could support a new modular factory that accelerates construction timelines by up to 35 percent.⁶

2

Supporting advanced infrastructure to achieve climate positivity

Waterfront Toronto sought a unique funding and innovation partner because it recognized that its ambitious goal of creating a climate-positive community — which requires exporting clean energy outside of a project area or actively reducing Toronto’s current greenhouse gas emissions through carbon offsets — cannot be achieved by simply extending existing infrastructure into new neighbourhoods. But designing, implementing, and operating the new, advanced infrastructure systems necessary to achieve climate positivity requires a large enough customer base to be effective and financially feasible.

Specifically, to keep Quayside resident energy bills in line with Toronto averages, the advanced power and thermal grids would require a \$19 million supplemental

innovation investment based on the current plan, due to factors including the high cost of geothermal exchange and initial electric grid connections, in addition to the poor economies of scale for operating costs. While this is not financially sustainable at the scale of each neighbourhood, no additional supplemental innovation investment would be required to extend operations into the River District beyond Villiers West, because the systems scale in a financially sustainable way.

The River District would provide a large enough area to support these investments, including new infrastructure to eliminate the use of natural gas and implement an advanced electric power grid, a new thermal energy grid for heating and cooling buildings, a new anaerobic digestion facility to process organic waste, and new digital technologies that can optimize energy use within buildings.⁷ This holistic plan could also encourage local companies and innovators to invest in new technologies (such as advances in battery storage capacity) to support the emerging cleantech industry.

With public-sector support, the Sidewalk Toronto project could become the largest, densest climate-positive district in North America and the third largest in the world — establishing a credible path forward for cities to follow.

The Sidewalk Toronto project could become the largest climate-positive district in North America.

3

Unlocking significant progress towards housing affordability

Waterfront Toronto has recognized that the eastern waterfront can become an essential piece of the city’s strategy to address increasingly urgent affordable housing needs — and that doing so creates an opportunity to honour the city’s commitment to inclusive, diverse neighbourhoods.

Sidewalk Labs has embraced this mission, with an ambitious commitment to make 40 percent of units in Quayside available at below-market rates.⁸ But with 2,600 total housing units, and roughly 1,000 below-market units, the neighbourhood has a limited ability to make a substantial dent in the city’s housing market.

To make a significant dent, Sidewalk Labs plans to explore a series of private funding sources that can help support an ambitious vision for housing affordability. These sources include affordability by design (using efficient unit design to create more total units, and thus additional value); the increased value of public land due to factory-built timber construction; and a condo resale fee.

At the Quayside scale, however, only affordability by design would create value (roughly \$37 million) that could be directed towards a below-market housing program. Generating land value from factory-based construction requires 6 million square feet of delivery output — far more than available in Quayside — to refine the factory process and reliably accelerate project timelines and reduce project risks for developers. And generating funds from the resale fee require ongoing condo turnover, and thus additional phases of development.

Applying these strategies at the scale of the River District has the potential to generate more than \$1.4 billion for below-market housing and support the creation of a housing trust fund that can assemble and distribute these funds.⁹ With this approach, the district would include an estimated 13,600 below-market units. (See Page 384 for more details.)

It also would offer a new range of housing types, ownership and rental models, and flexible units, creating inclusive communities that welcome Torontonians across all lifestyles, life stages, and income levels.

Housing affordability by the numbers:
 → **40% below-market vision**
 → **More than \$1.4 billion in private funding**
 → **Up to 13,600 below-market units (with additional government support)**

Creating a 21st-century mobility network

Extending the LRT into the Port Lands.

Toronto has planned an extension of its public transit network across the eastern waterfront since 2006, recognizing light rail's role in supporting the development of sustainable neighbourhoods. But the plans, which could cost as much as \$1.2 billion, remain unfunded.¹⁰ Sidewalk Labs is proposing, if public funding is not available, that this critical project can be built now and financed through future revenue streams generated by the development made possible by the transit extension.

This self-financing approach is a proven strategy for accelerating transit construction in a way that does not compete with other public spending priorities.¹¹ Sidewalk Labs is prepared to provide financial support to this approach, but it only becomes viable if the new transit lines would serve a sufficient amount of development.

Quayside's proposed development of 10 buildings (roughly 2.65 million square feet) is not large enough to sustainably support the financing of the waterfront light rail. An area the size of the proposed River District (nearly 27 million square feet) could provide enough density to pursue promising self-financing methods for the light rail, such as tax increment financing.

Once built, the new light rail lines would become a fundamental driver of the eastern waterfront's economic development strategy, accelerating the creation of thriving new transit-first neighbourhoods.

Designing a network of new mobility options.

The limited street network of Quayside can be used to develop new ways to design streets that prioritize people and cyclists, improve the efficiency of how space is allocated as travel patterns shift across a day, and incorporate adaptable features that can respond to new mobility options as they emerge. But while the neighbourhood's four blocks can be an effective demonstration project, streets only have transformative impact when they form a network.

If Quayside's mobility innovations are applied across the River District, there would be opportunities to give residents, workers, and visitors a full set of transportation options designed to meet all of their needs without owning a car, helping to reshape mobility patterns across the city. Within the IDEA District, 77 percent of trips could be made through transit or active modes.

Toronto could also take a leadership role on how to thoughtfully integrate emerging mobility options like self-driving vehicles. The River District could showcase the world's first street network designed to integrate self-driving vehicles in a way that supports public transit use, shared rides, and enhanced pedestrian and cycling experiences.

Creating the conditions for urban innovation

The true impact of the proposed innovations would come not as individual components but as a comprehensive set of initiatives that together can create the conditions to improve how cities function and enhance quality of life.

By establishing the physical, digital, and policy conditions for urban innovation, the River District can become a beacon for researchers, entrepreneurs, civic organizations, government agencies, and innovators from around the globe to create countless new services and products designed to improve urban life.

At the heart of this vision is the ability to create the digital conditions for others to build on. These include:

- Providing more affordable and flexible digital infrastructure, such as ubiquitous connectivity and standardized mounts
- Setting data standards that are open and secure
- Creating a trusted process for responsible data use, with a proposed independent Urban Data Trust to oversee and approve the use or collection of urban data
- Launching core digital services that others can build on through open access to properly protected urban data.

Together, these conditions would help the IDEA District become an economic engine — with a focus on urban innovation — that generates up to 93,000 total jobs, \$14.2 billion in annual economic output (GDP), and \$4.3 billion in annual tax revenue by 2040.

But while Quayside is the perfect demonstration site to begin developing these digital conditions, many require the scale of the River District to realize their full potential.

For example, new advances in fibre-optic technology and network security can build on Waterfront Toronto's progress bridging the digital divide by offering residents and businesses access to secure, super-fast internet connections at an affordable cost. These advances can also enable countless new solutions to be developed by a wide array of third parties, supporting the development of an economic cluster in urban innovation. But such an advanced network only becomes financially sustainable at the scale of the River District, given the number of residents or businesses needed to recoup the initial investment in core enabling infrastructure.

By planning holistically, and over a large enough area, the integration of these systems and innovations can unlock transformative change. This is the opportunity before Toronto.



See the “Digital Innovation” chapter of Volume 2 for more details on these proposed initiatives.

Key Term Urban data

Information gathered in the city's physical environment, including the public realm, publicly accessible spaces, and even some private buildings.

River District impact: The new bottom line

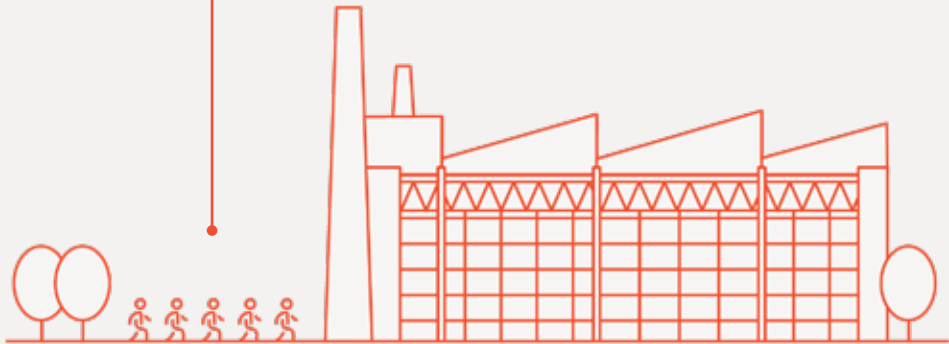
The combined impact of Sidewalk Labs’ proposal for Quayside and the River District could achieve Waterfront Toronto’s priority outcomes around job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance) — establishing the waterfront as a global demonstration project.¹²



Economic impact

An economic engine that creates 93,000 total jobs (including 44,000 direct jobs) and generates \$14.2 billion in annual economic impact by 2040

A new Ontario-based factory that catalyzes a Canadian mass timber industry

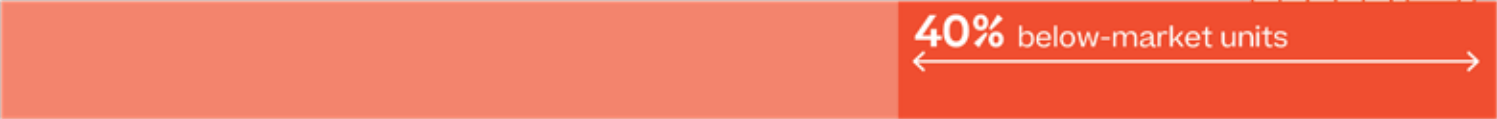
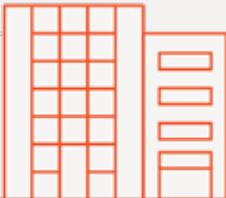


Climate impact



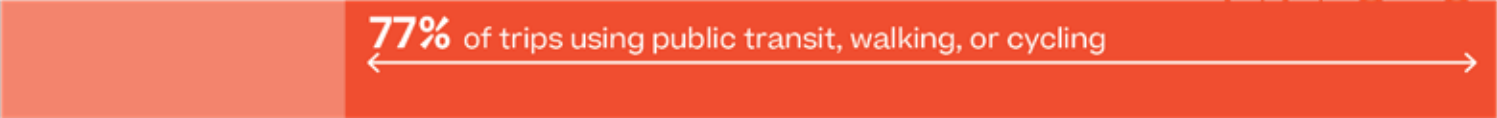
A climate-positive neighbourhood that cuts greenhouse gases by 89 percent

Housing affordability impact



A housing vision with 40 percent of units at below-market rates, supported by more than \$1.4 billion in new private funding sources

Mobility impact



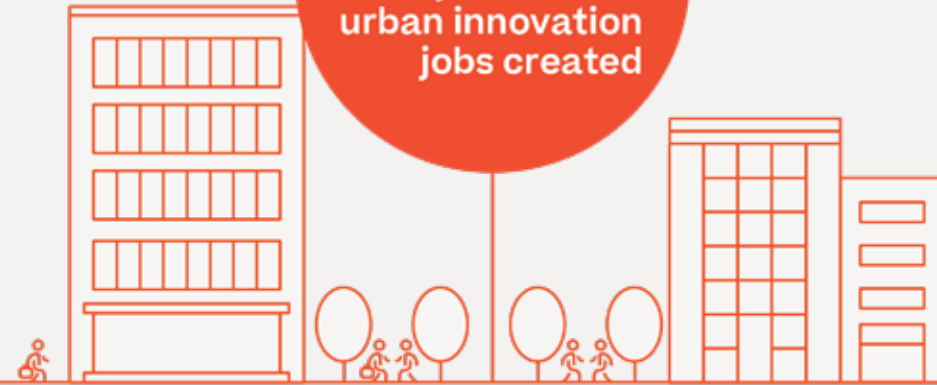
An estimated 77 percent of trips would use public transit or active modes, like walking or cycling

Urban innovation impact



A new innovation campus and economic cluster, with 10,500 jobs (of the 93,000 total) focused specifically on urban innovation

The ability to catalyze digital innovation while protecting privacy and the public good through a new standard of responsible data use



A Pivotal Moment for the Future of the Eastern Waterfront

The area’s lack of basic infrastructure and transit connections are a barrier — and an opportunity. Installing innovative systems across the proposed River District can provide the foundation to attract private development that would fully unlock the waterfront’s potential.

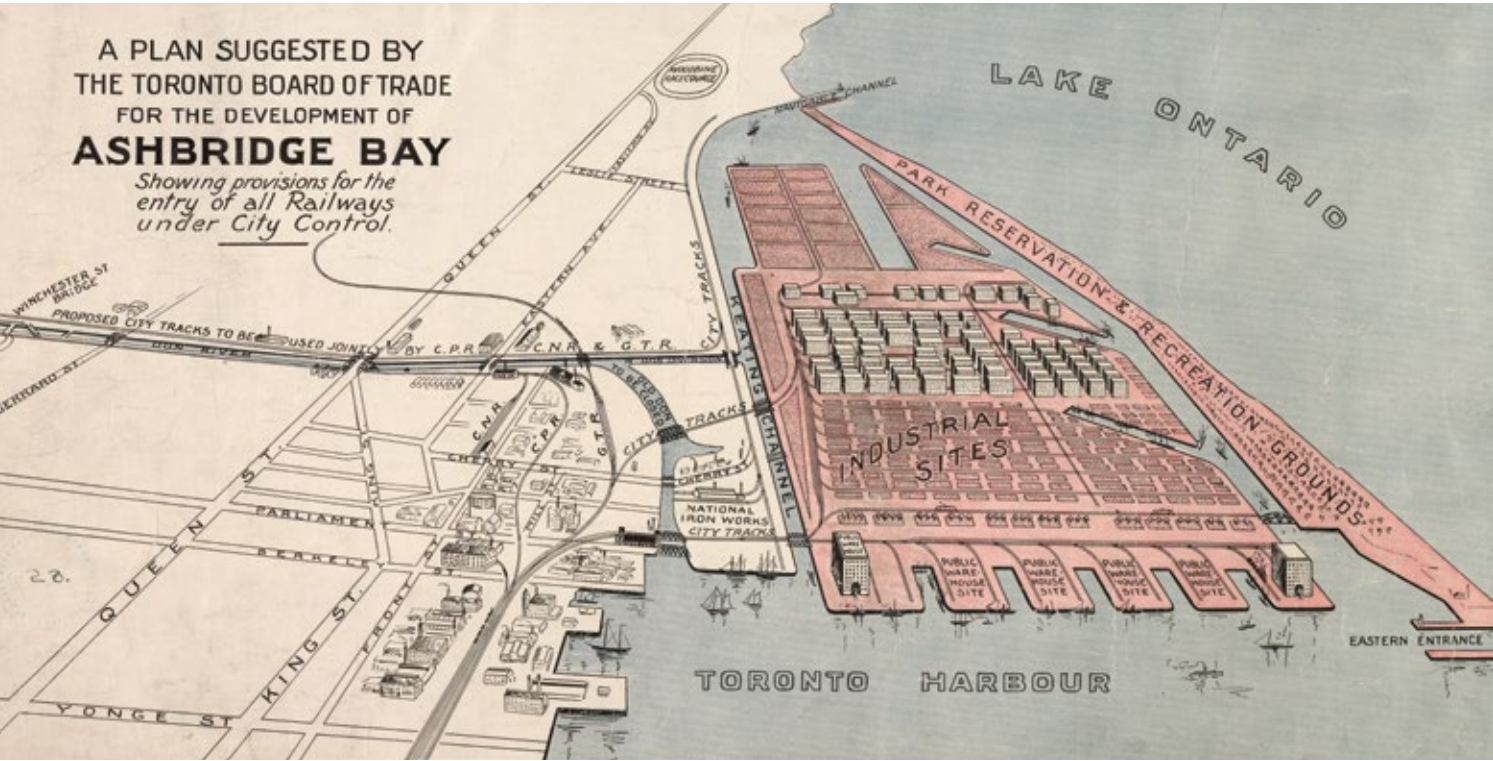
The River District history: Unfulfilled potential

In the early 1900s, civic leaders targeted what was then the marshy and highly polluted area at the mouth of the Don River, known as Ashbridges Bay, as a potential new centre for shipping, industry, and commerce.¹³

They created the Toronto Harbour Commission in 1911 with the goal of establishing a competitive port, filling in Ashbridge’s Bay with lakefill and constructing new quays, extensive dockwalls, and two new shipping channels that cut through the new land. In addition, plans were sketched out for parks, homes, beaches, and winding lagoons that could serve as living and recreational areas for residents.

But these ambitions were never fully realized, as the port never achieved the full anticipated growth.

After World War II, Toronto’s economy shifted away from manufacturing — as was the case in many cities across North America — leaving the waterfront’s industrial areas to enter a long period of decline and neglect. Today, beyond the important Film District, the eastern waterfront is largely a storage ground whose remaining industrial structures serve as a testament to the difficulty of large-scale urban development.



The Ashbridges Bay Development Plan — one of the earliest proposals for the eastern waterfront, from the Toronto Board of Trade in 1909 — envisioned Ashbridges Bay as an island encircled by shipping channels with rail-only access. Credit: Toronto Public Library

The River District today: Poised to fulfill its promise



In 2018, Waterfront Toronto began construction on a complex, \$1.25 billion plan to protect the Port Lands from flooding, taking a key step towards unlocking revitalization. Credit: DroneBoy

With the central waterfront district approaching completion, and the rezoning for the nearby East Harbour district approved, the eastern waterfront area has once again become a central focus of Toronto’s planning efforts. There is widespread recognition that this unique moment requires an ambitious and forward-looking approach to development.

As the city grows, the need for additional sustainable neighbourhoods, affordable housing, and space for growing industries has become more urgent. Whereas the Port Lands were once isolated and distant from the city’s core, today

new buildings on the waterfront have marched steadily eastward, with numerous projects completed and others currently under construction within a few blocks of Quayside.

Once again, Toronto’s planning efforts have focused on the potential of this area for economic development that can benefit the entire city. But a new generation of thinking, led by Waterfront Toronto, seeks a holistic approach that re-establishes natural systems and provides for a more sustainable and healthy kind of urban growth.

Planning spotlight

How the River District proposal adds value to the Port Lands Planning Framework

Released in 2017 by the City of Toronto and Waterfront Toronto, the Port Lands Planning Framework outlines a high-level vision for the future development of this area over a timeline of roughly 50 years.

By extending the innovative approach to planning initiated in Quayside and leveraging long-term resources, Sidewalk Labs can not only help achieve this vision but help to accelerate it and amplify many of its core components. At nearly 27 million square feet of development, the River District envisions a density with the potential to unlock a public transit expansion, dramatically increase the supply of affordable housing, and generate billions in tax revenue for the economy — achieving city and waterfront objectives years sooner than anticipated by the framework.

Some key areas where the River District proposal adds value to the Port Lands Planning Framework include:

Envisioning Villiers Island as a major economic hub.

The Port Lands Planning Framework identifies Villiers Island as mostly a residential mixed-use area. The River District proposal builds on this foundation by identifying the area as a potential major economic and employment hub anchored around an urban innovation campus, enabling the creation of a true live-work-make community and a significant revenue source for the city. (See Page 292 for more.)

Preparing for self-driving vehicles.

The framework envisions the creation of a balanced mobility system that emphasizes public

transit, walking, and cycling. The River District proposal complements that approach by designing adaptable streets that anticipate the safe arrival of self-driving vehicles operating as a shared service, dramatically reducing the need for residents and workers to own a car and enabling a significant amount of road and parking space to be reclaimed for public space. Additionally, the potential for self-driving vehicles to operate as electric vehicles is a significant component of the path toward climate positivity.

Developing advanced energy infrastructure.

The framework calls for innovations and infrastructure that can help realize a climate-positive community but does not identify the advanced systems needed to achieve it. The River District proposal introduces a comprehensive approach towards climate positivity through advanced infrastructure systems (identified on Page 322) supported by digital energy management tools.

Planning for greater density to unlock a transit expansion and sustainable development.

The River District proposal envisions a greater scale of density than commonly assumed for the Port Lands Planning Framework (particularly in Polson Quay), characterized by a mixture of residential uses alongside non-residential uses such as retail, office, community, and production. Greater density unlocks the ability to finance sustainable infrastructure, such as the transit expansion (see Page 352) and improves affordability through the delivery of a significant supply of below-market housing (see Page 389).

Expanding the supply of affordable and below-market housing.

The River District proposal strives to exceed current waterfront requirements for housing affordability by promoting a housing vision defined by 40 percent below-market units. This vision targets 20 percent of housing units for middle-income households that currently do not qualify for affordable housing and envisions half of all units being purpose-built rentals to improve long-term affordability. The proposal also outlines paths for developers to support ambitious public goals for affordable housing, including through the use of new financial tools and efficient unit designs that can create new value that can be applied towards below-market programs (see Page 386).

Accelerating the development timeline.

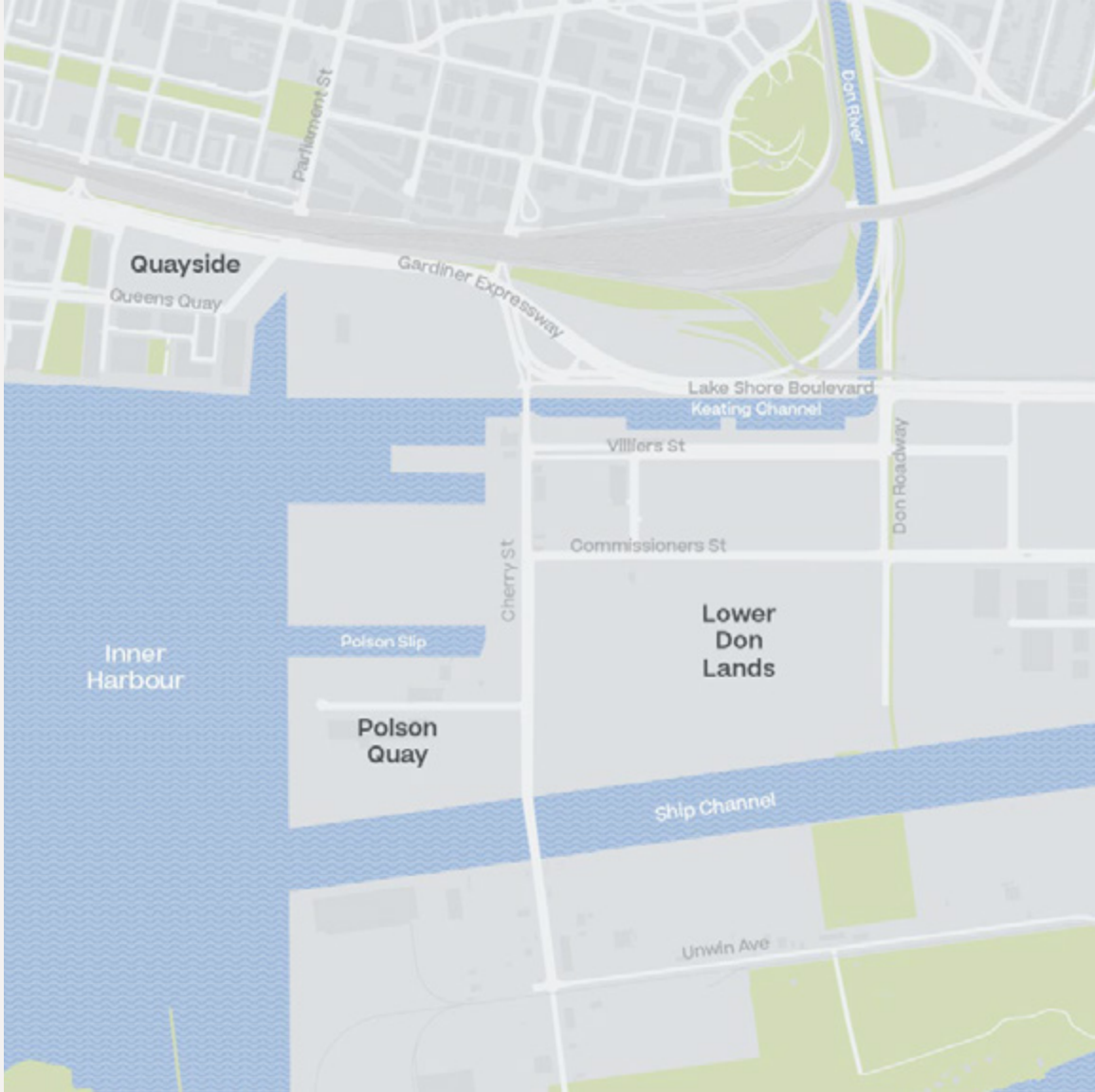
The Port Lands Planning Framework considers the area’s evolution across a period of roughly 50 years. The River District proposal leverages private-sector resources to help deliver more than 30 percent more square feet of development on a timeline 10 years faster than the current plan. (The full IDEA District proposal would produce 32.8 million square feet of development by 2040, versus a baseline scenario of 24.4 million square feet by 2050.) The IDEA District has the potential to generate an enormous annual benefit to the Canadian economy, including over 93,000 jobs, \$14.2 billion in annual economic output, and \$4.3 billion in annual tax revenues. (See the “Economic Development” chapter of Volume 1.)

Map

Port Lands Flood Protection Project: Creating Villiers Island

Before:

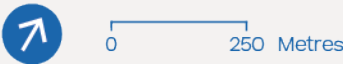
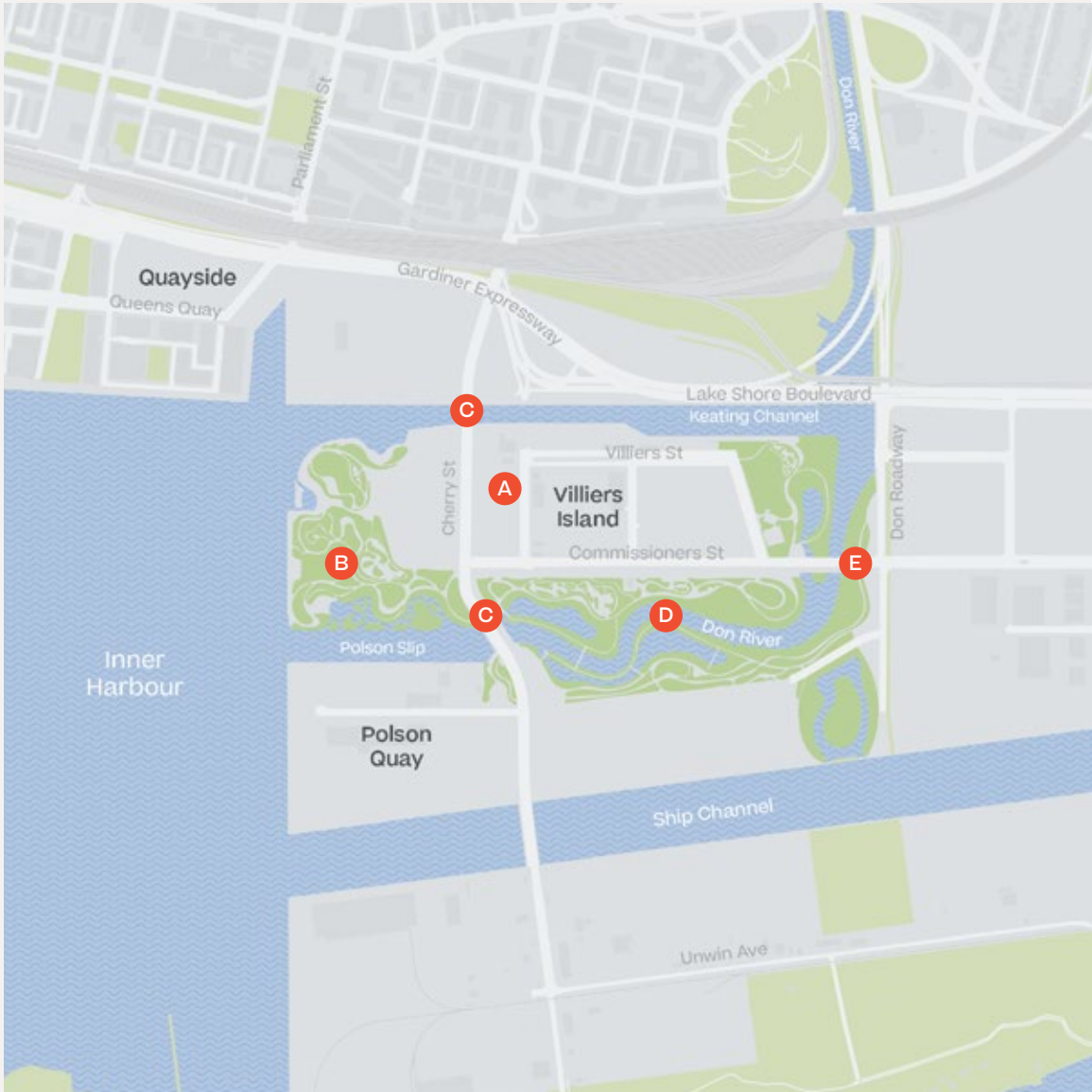
The Port Lands today



After:

The Port Lands after the flood- protection project

- A** Creation of Villiers Island
- B** Establishment of new park system
- C** Construction of new bridges at Cherry Street
- D** Renaturalization of Don River
- E** Construction of new bridge at Commissioners Street



The Port Lands Planning Framework lays out a vision to transform these industrial lands into an economic and innovation hub that adapts to changing conditions, enjoys ubiquitous connectivity, respects the waterfront context, and creates a network of dynamic new neighbourhoods. “Over the coming decades, the Port Lands will transform from a predominantly industrial district into a modern and vibrant extension of the urban metropolis,” reads the framework. “The Port Lands will be a showcase for innovation and a leader in environmental performance.”¹⁴

At a similar size as downtown Toronto, the Port Lands can be reimagined not simply as a series of new live-work communities on the water but as an expansion of the central city itself — with a full and diverse range of innovative areas for working and production that allows the Toronto economy to grow and prosper.

The Port Lands Flood Protection Project: Setting the stage for development. In 2018, Waterfront Toronto began construction on a complex, \$1.25 billion plan to protect large southeastern portions of downtown Toronto, including significant portions of the Port Lands, from flooding. Funded by all levels of government, this investment aims to unlock the Port Lands for revitalization, to enable the creation of new communities, to improve Toronto’s resiliency in response to the growing impacts of climate change, and to lay the groundwork for economic development.

The design concept for the project was the result of an international competition led by Waterfront Toronto, which challenged respondents to think differently about natural systems, public space, and development.¹⁵ As a result, the project takes a highly innovative approach to providing flood protection.

For example, rather than rely exclusively on traditional “hard” concrete infrastructure (such as dockwalls, channels, and pipes) to manage water, the project envisions a renaturalized riverbed that allows the Don River to flow through newly created wetlands and natural habitats configured to allow for expansion of the riverbed during floods and for contraction during normal times. The project is scheduled to be completed in 2024.¹⁶

While the investment in the Port Lands Flood Protection Project is extraordinary, it is only a first step. Substantial additional investments are required to fully unlock the area’s potential. The lack of modern infrastructure and questions over how to finance it create a formidable barrier to any kind of development, let alone the standard-setting communities envisioned by Waterfront Toronto and the City of Toronto in the Port Lands Planning Framework.

The River District tomorrow: Infrastructure to meet future needs

Over the coming years, substantial investments in infrastructure will be required at the Port Lands well beyond the flood protection work, and the results will determine the future of the waterfront.

The infrastructure developed nearly a century ago to support an industrial centre is not up to the demands of a modern mixed-use district hosting tens of thousands of workers, residents, and visitors. As a result, the eastern waterfront requires entirely new systems for transportation, energy, information technology, water, freight, and waste.

The standard approach to new development would suggest extending the existing infrastructure along the waterfront into the Port Lands, and incrementally

building it for each new neighbourhood as it develops. But this approach would forfeit an extraordinary opportunity to think holistically about the potential of the eastern waterfront to implement a more sustainable, integrated, and forward-looking set of urban systems that can achieve the city's goals of climate-positive neighbourhoods and new mobility infrastructure, while building in flexibility to meet the needs of future generations.

If implemented, these systems would fuel economic development, empowering Toronto as a driver of innovation, supporting local companies, and attracting investment from around the globe.

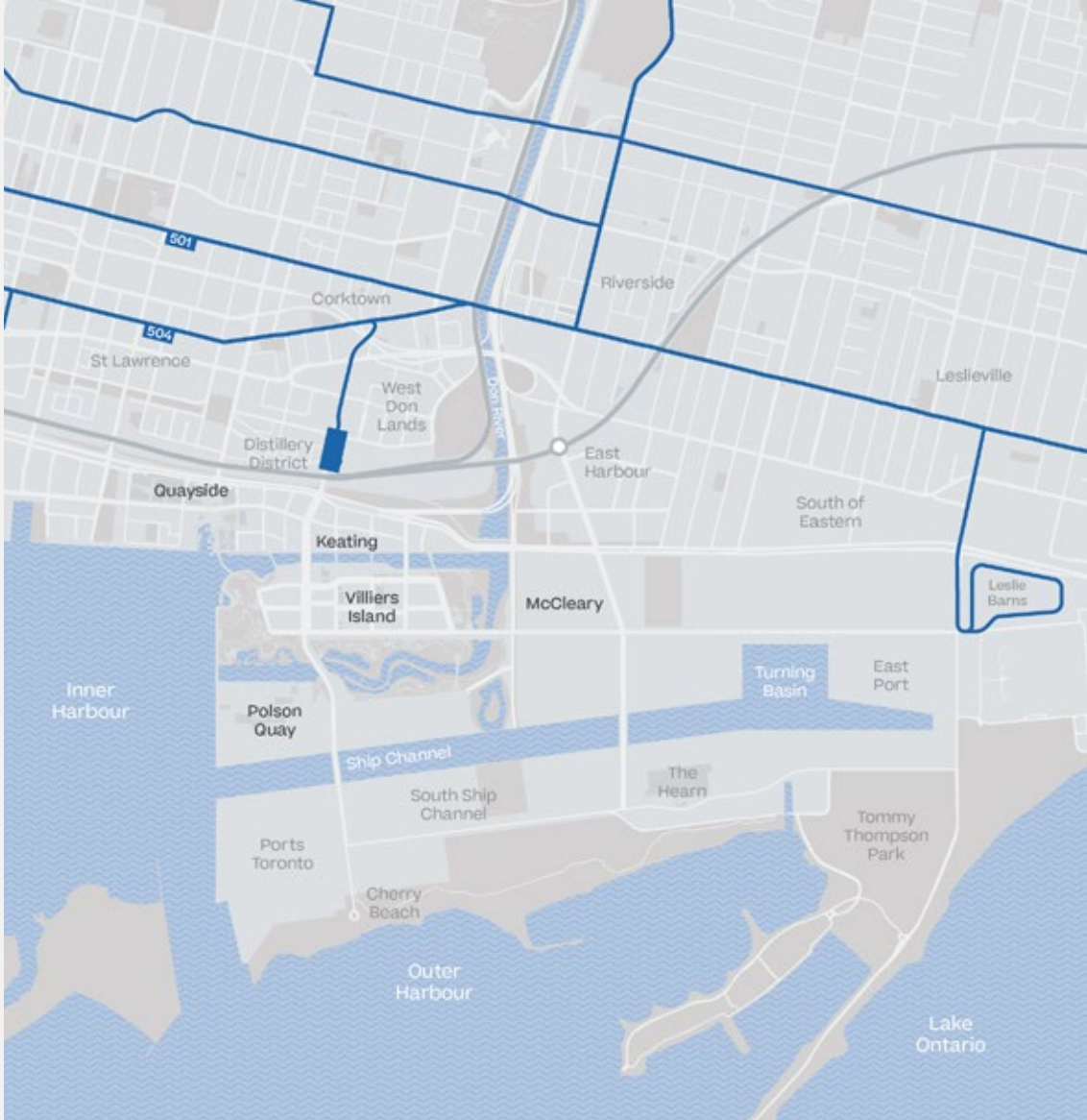
East end of Keating Channel, looking south-west.
Credit: City of Toronto Archives



Map Rapid transit connections in the eastern waterfront

Before: Light rail network today near the eastern waterfront

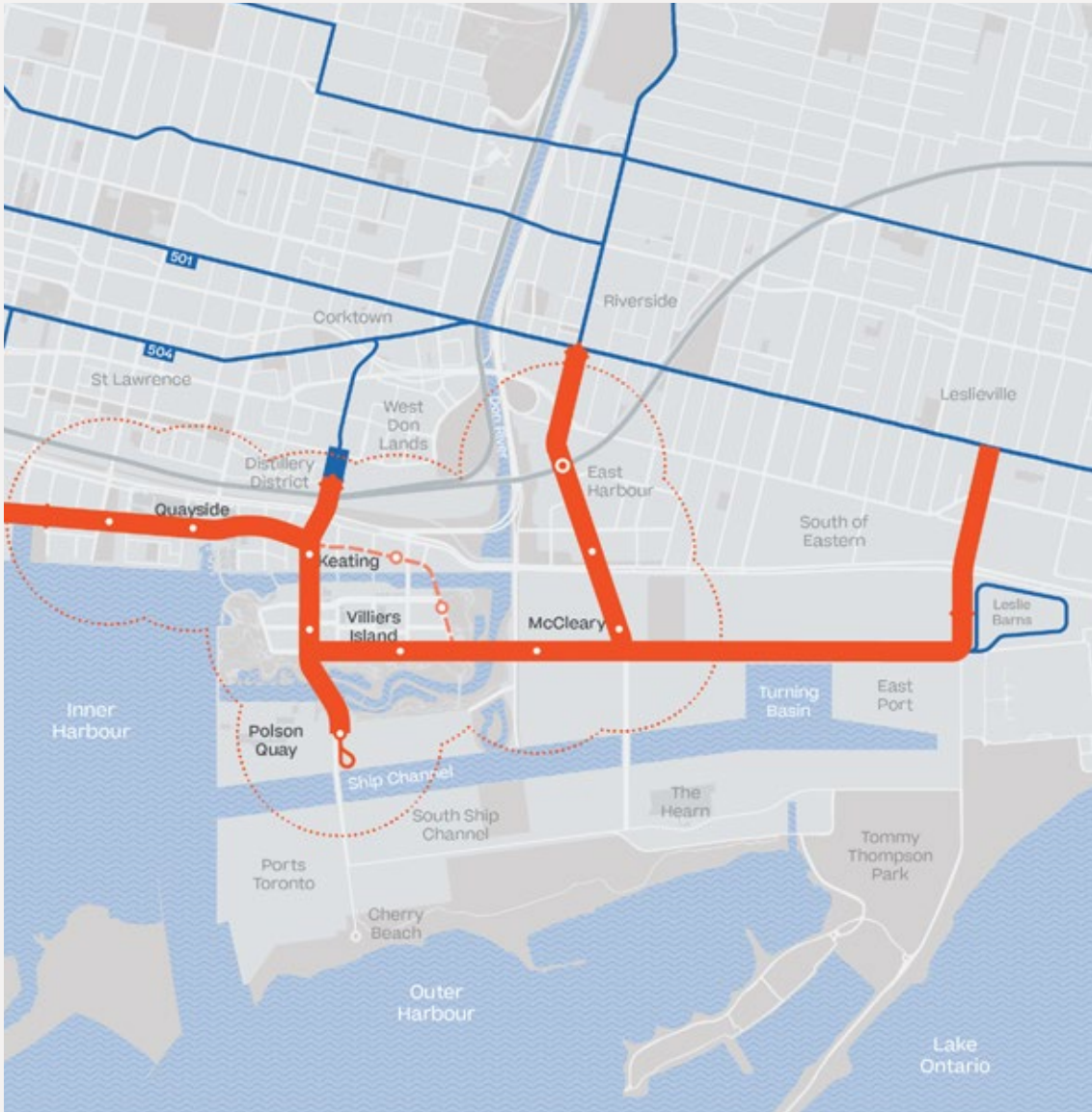
GO Transit / SmartTrack
Existing light rail



After: Light rail expansion into the eastern waterfront

GO Transit / SmartTrack
Existing
Approved extension
Optional
5-minute walk from new stops
Planned East Harbour Station

0 500 Metres



The River District Can Anchor a Renewed Eastern Waterfront

Collectively, five distinct neighbourhoods have the potential to form a spectacular district driven by innovation, including a new Google Canadian headquarters and an Urban Innovation Institute.

Spanning 62 hectares, the proposed River District would encompass five distinct neighbourhoods surrounding the renaturalized Don River: Villiers West, Villiers East, Keating East, McCleary, and Polson Quay. These neighbourhoods would be carefully stitched into their surrounding environments, including extending the innovation corridor along Queens Quay and into Quayside.

These are the only areas within the Port Lands Planning Framework that have been identified as appropriate for

mixed-use growth. Consistent with the framework, Sidewalk Labs envisions them as complete communities that integrate residential and recreational uses alongside significant urban innovation jobs focused on production, interactive, and creative industries.

Sidewalk Labs believes that applying new technologies and approaches can foster even more jobs and businesses than a

traditional mixed-use development while providing a higher quality of life for workers, visitors, and residents.

To name just a few examples: new flexible building types, coupled with outcome-based building-code systems, can expand the types of non-residential uses that can coexist in a neighbourhood and strengthen opportunities for true live-work-make communities. New mobility networks that are reliant on public transit and active modes, along with dense housing (including a 40 percent below-market program) adjacent to job centres, can provide a level of convenience and sustainability across the district. Extending the light rail can accelerate the pace of development in significant ways, especially when coupled with digital design

and fabrication strategies for buildings, bringing benefits to Toronto sooner than originally anticipated.

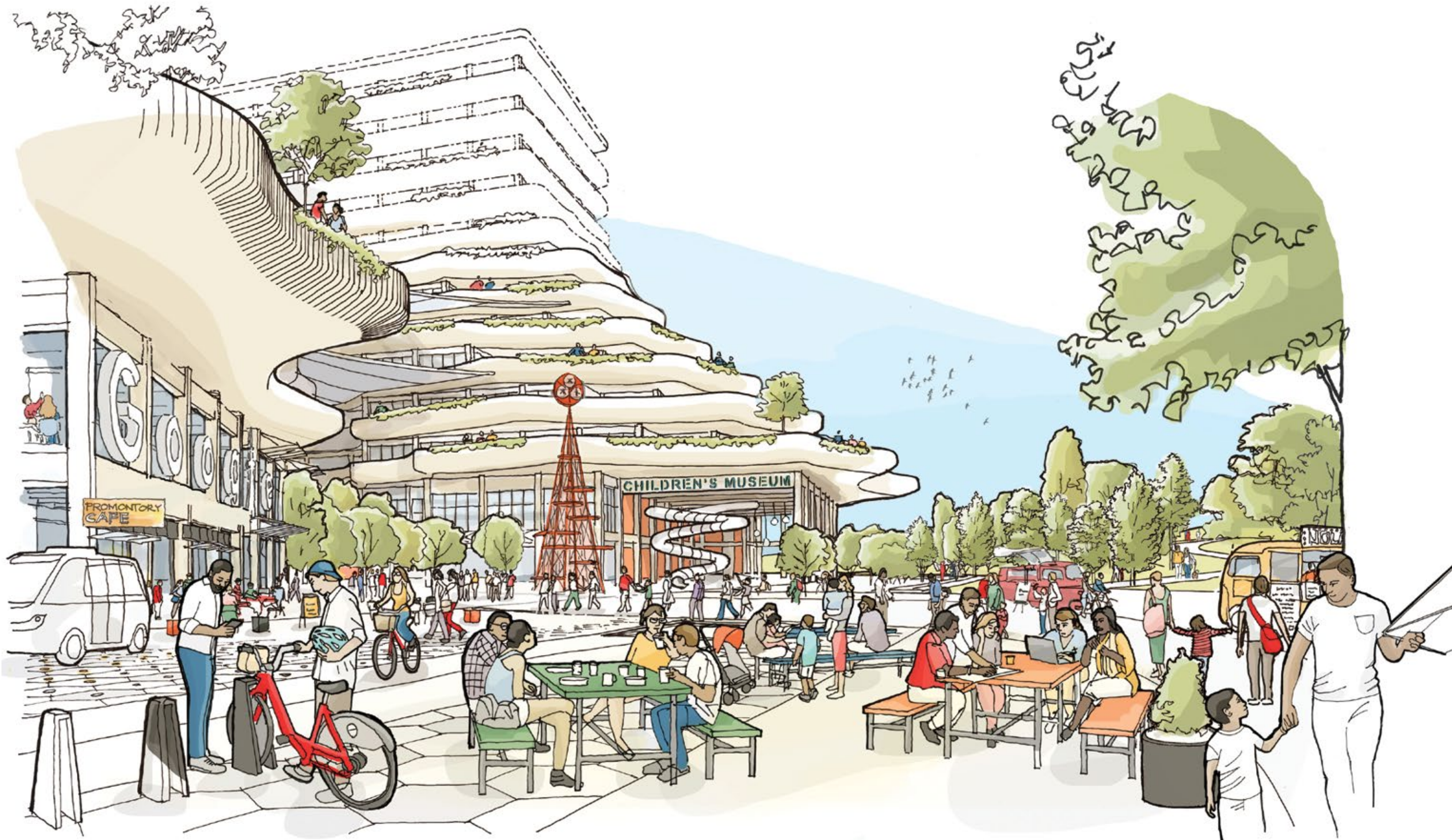
A key focus for these neighbourhoods would be support for existing industries, such as the film industry. That support could include housing options geared towards the labour-force demands of the area, such as workers supporting the film studios.

The creation of an IDEA District anchored by an innovation campus can create an ecosystem of people and businesses continually generating and implementing new ideas to improve urban life. The River District has the potential to become the globally recognized centre where urban innovations emerge, grow, and flourish.



Villiers West

The 7.75-hectare western half of Villiers Island has the potential to catalyze economic development across the region, anchored by the new Google Canadian headquarters and an Urban Innovation Institute designed to connect seamlessly with the new Promontory Park. Sidewalk Labs proposes to act as the vertical developer for this area in concert with local development partners.



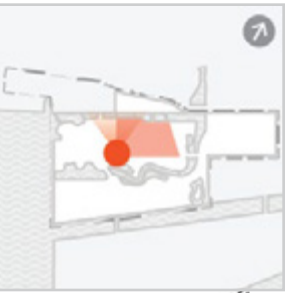
This illustration shows the Villiers West innovation campus and Promontory Park.

Villiers East

The 11.5-hectare eastern half of Villiers Island offers an exceptional opportunity to create an inviting, walkable live-work community. In addition to jobs, Villiers East could be filled with affordable housing options, retail and other ground-floor uses, and a new pedestrian-first street network designed to create a series of intimate walkways and courtyards, all encircled by a magnificent new park created as part of the flood protection work.

In this area, and for the rest of the River District, Sidewalk Labs would play a supporting role as Innovation and Funding Partner, while Waterfront Toronto and the City of Toronto work with other partners to undertake development.

A conceptual illustration of a Villiers East Accessway and plaza, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Keating East

The planned relocation of the Gardiner Expressway will create the opportunity for a new six-hectare neighbourhood along the reclaimed Keating Channel. The Port Lands Planning Framework envisions the channel as the centrepiece of the surrounding neighbourhoods.

Sidewalk Labs embraces this vision and believes that the spirit of innovation animating the adjacent innovation campus can become a driving programmatic force for the channel. A Keating Channel exploration zone could become a dynamic, water-focused spine that showcases groundbreaking work across arts, culture, and production.

Taller buildings along the highway could scale down as they approach this intimate waterway, establishing the canal as a unique place in Toronto with vibrant public space and development on both sides of the water. Multiple new pedestrian and bike bridges are proposed across the channel, creating a character similar to the canals of Amsterdam.

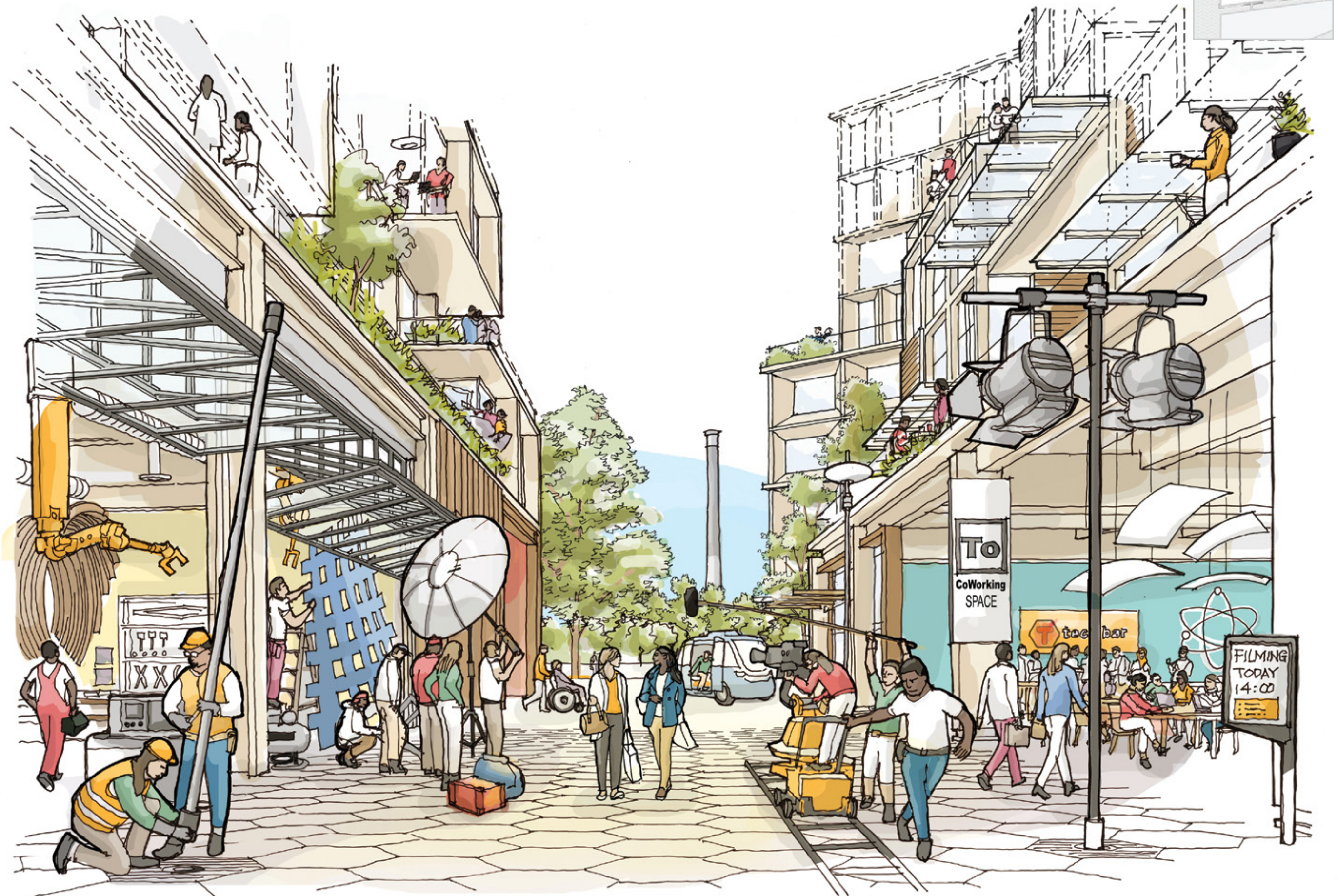
A conceptual illustration of Keating Channel, looking west, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Consistent with the Port Lands Planning Framework's direction as a mixed-use area focused on production, interactive, and creative industries, the 14-hectare McCleary District could integrate dense housing with commercial space that complements East Harbour and the Film District, with spaces equipped to support production shoots and new economy companies, startups, micro-enterprises, and creative industries.

Located within short walking or biking distance of the Film District, East Harbour, and the innovation campus on Villiers Island, McCleary could become an ideal residential location for people with jobs in the neighbourhood and nearby. In addition, a new light rail stop located on Commissioners Street would ensure access to major transportation hubs and downtown Toronto.

A conceptual view of a future street in McCleary, looking east to McCleary Park, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Polson Quay

Polson Quay encompasses both the Polson Quay and South River areas identified in the Port Lands Planning Framework. Establishing connections to the rest of the city will be critical to the growth of this 23-hectare neighbourhood, located south of Villiers Island and along the south side of the newly naturalized Don River.

As in Villiers Island, a series of bridges in Polson Quay could form important links to the surrounding city, including space for a light rail extension with a new stop in the centre of the neighbourhood. With these key investments in place, Polson Quay can take full advantage of its geography and dramatic views of the harbour and city skyline to become a place where production, interactive, and creative uses can coexist in an integrated way with housing, commercial activity, community spaces, and an accessible public realm — achieving a unique live-work-make waterfront neighbourhood.

A conceptual view of Polson Quay, looking north to downtown, made possible by the IDEA District's innovative approach to development. (Planning for this neighbourhood to be led by Waterfront Toronto and the City of Toronto.)



Neighbour- hood Planning Concepts

The following section describes Sidewalk Labs development proposal for the Villiers West area of the River District, where it would assume the role of real estate developer in concert with local development partners.

This section also describes visions for the other four neighbourhoods that would make up the district, where Sidewalk Labs would play the role of Innovation and Funding Partner.

The River District Program

The River District can become a major economic engine for the eastern waterfront while integrating employment, residential, commercial, cultural, and public spaces to become a vibrant urban district.

The Port Lands Planning Framework provides the roadmap for the transformation of the area surrounding the renaturalized Don River from a formerly industrial area to a modern, vibrant, mixed-use urban community. The framework has broad goals, envisioning the creation of “vibrant districts with unique and memorable local identities that promote social interaction, cultural enrichment, ecological health, a low-carbon future, and a prosperous local economy.”

Sidewalk Labs believes that this ambitious vision can be substantially advanced within the River District’s five distinct neighbourhoods: Villiers West, Villiers East, Keating East, McCleary, and Polson Quay.

Collectively, they can form the world’s most innovative urban district, generating thousands of jobs, creating walkable live-work communities that are exhilarating and welcoming in equal measure, and setting new global standards for sustainability.

The River District consists of the same areas within the Port Lands Planning Framework that have been identified as appropriate for mixed-use growth. As described on Page 275, Sidewalk Labs proposes to accelerate development within the River District and to significantly expand the benefits of such development.

Anchored by an innovation campus, the River District would create the conditions for ongoing research and innovation, fostering an ecosystem of people and businesses that continually implements new ideas aimed at improving urban life. It would be supported by advanced infrastructure that makes climate positivity possible, a reconceived mobility network that provides a balanced set of mobility options, and digital infrastructure that helps to bridge the digital divide and facilitate innovation by an array of third parties.

These innovations would allow the development to occur years faster than is currently anticipated and create neighbourhoods that can support higher densities, like Polson Quay, without sacrificing open space or quality of life.

The River District proposal leverages private-sector resources to help deliver more than 30 percent more square feet of development on a timeline 10 years faster than the current plan. (The full IDEA District proposal would produce 32.8 million square feet of development by 2040, versus a baseline scenario of 24.4 million square feet by 2050.)

Key Term
Stoa spaces
(found on the lower two floors) are designed to accommodate a wide range of uses beyond traditional retail, helping to activate the street.

Establishing a new regional economic anchor.
The River District development program proposed by Sidewalk Labs would be anchored by a new innovation campus located on the western edge of Villiers. This campus would be catalyzed by a new Google Canadian headquarters and the applied research focus of the Urban Innovation Institute, driving thousands of jobs

across the eastern waterfront and attracting new companies to create a global hub for creative and innovative industries.

The innovation campus and broader ecosystem of urban innovation would complement the Film District expansion to the east and the East Harbour development to the north, providing another strong economic driver of economic expansion throughout the Port Lands.

Integrating production spaces.
The Port Lands Planning Framework designates Polson Quay and McCleary as mixed-use areas focused on production, interactive, and creative industries. Such areas are intended to enhance and expand the local economy and ensure Toronto remains a place for creativity and innovation by fostering growth in Toronto’s film industries, interactive and digital media, and art and design.

With key economic anchors in place, and new investments in transportation, infrastructure, and public parks, the River District can be an attractive place to live, work, and visit, with a striking mix of uses throughout its neighbourhoods.

New production and workshop facilities, enabled by Sidewalk Labs’ unique lower-floor stoa spaces, can be located throughout the district, strengthening the commitment to a diversity of uses and providing additional opportunities for small businesses that build off new technologies and capabilities.

The River District
could be home to
34,000
new housing units.

Supporting new live-work communities.
One highly attractive feature of urban living is the ability to live and work in the same neighbourhood. This opportunity has been appreciated by generations of Torontonians but is increasingly difficult to achieve as downtown living gains in popularity and residential uses compete with commercial and office uses.

Providing housing opportunities on parcels adjacent to employment centres enhances the ability of the employment spaces to succeed and provides a diversity of job opportunities for different income groups.

With a housing vision that could produce around 34,000 new housing units (including 40 percent of units at below-market rates), the River District can make a significant contribution to achieving Toronto’s affordable housing goals, leveraging new private funding sources alongside additional government support.¹⁷ And with the scale of the River District, new and creative housing types can proliferate, providing a wide range of housing options for individuals and families at different stages of life.

Fostering more ground-floor diversity.
With thriving commercial centres, a large local population, and safe, walkable streets, the River District would become an attractive place for retail and entertainment. Flexible lower-floor stoa spaces can be expanded across the River District, increasing opportunities for entrepreneurs to explore new ideas and for residents to enjoy a wider and

ever-changing series of retail choices. The flexibility of the stoa model also provides space for artists, cultural organizations, and small businesses to become a significant and defining feature of these new neighbourhoods.

Incorporating social infrastructure into the foundations of new communities.
A key feature provided by the stoa model is the opportunity to incorporate social infrastructure facilities at multiple locations throughout a neighbourhood, rather than to set aside separate parcels of land. At the scale of the River District, a wide variety of health, educational, and civic facilities can form a true network of social infrastructure, increasing access to services and opportunities for residents and workers.

Drawing people outdoors more of the time.
By planning for a diversity of flexible spaces and designing streets to increase space for the public realm, the River District could become home both to more open space and to a greater variety of space than previously planned. Nature could be integrated into streets; water could be not only accessible but also part of everyday life; pedestrian-friendly courtyards could open onto plazas full of busy cafés and connect residents and workers to a vast network of parks. The variety of uses could draw ever more people into the public realm, which would act as the backbone of local civic life and as a backyard for families.



Key facts:
Villiers West

Development timeline
2023–2027

Size
7.8 hectares

Total area
Roughly 2.75 million square feet

The proposed innovation campus in Villiers West would be planned and designed as a public place that is fully integrated into the neighbourhood fabric.

The location on the edge of Villiers Island would benefit new companies but also comes with a civic responsibility to ensure this extraordinary space is fundamentally public, open, and welcoming to all.

The Villiers West innovation campus





Villiers West would feature a Centre Street pedestrian walkway (shown here, looking west towards Promontory Park).

The proposed program for the River District would create a significant new addition to Toronto’s existing network of vibrant, mixed neighbourhoods in and around downtown. Unlike many recent new developments that have focused heavily on residential development, the River District program is consistent with the land-use designations contained in the Port Lands Planning Framework.

This program takes the mixed-use goal further by proposing a major new economic hub for Villiers West and more

overall development (although densities are not specifically prescribed in the framework and are left to the pre-cinct planning stage). Both are positive changes that provide a major economic benefit to the city.

These levels of density are critical to finance the public transit extension needed to unlock sustainable development, as well as to support the creation of other municipal and advanced infrastructure systems.

Villiers West: Creating an Economic Hub Within a Thriving New Neighbourhood

Home to a new innovation campus, including a new Google Canadian headquarters, Villiers West can become the economic anchor of the River District, helping to generate 93,000 total jobs across the full IDEA District.

	Residential	Commercial	Retail / Production	Social infrastructure	Total
Land use program (in square feet)					
Villiers West	1,150,000	1,400,000	150,000	50,000	2,750,000
	42%	51%	5%	2%	100%
Villiers East	3,400,000	500,000	200,000	50,000	4,150,000
	82%	12%	5%	1%	100%
Keating Channel	2,250,000	850,000	250,000	100,000	3,450,000
	65%	25%	7%	3%	100%
Polson Quay	7,350,000	1,800,000	450,000	150,000	9,750,000
	75%	18%	5%	2%	100%
McCleary	4,550,000	1,750,000	300,000	100,000	6,700,000
	68%	26%	4%	1%	100%
Total	18,700,000	6,300,000	1,350,000	450,000	26,800,000

Note: Percentages may not add up due to rounding. Table reflects the magnitude of development (in gross square feet for the River District).

Building an economic cluster around urban innovation

As further described in the “Economic Development” chapter of Volume 1, Sidewalk Labs plans to help catalyze an economic cluster focused on urban innovation. This effort defines urban innovation as going beyond the mere pursuit of urban efficiencies associated with the “smart cities” movement, towards a broader set of digital, physical, and policy advances that enable government agencies, academics, civic institutions, and entrepreneurs both local and global to address large urban challenges.

Anchored by a new Google Canadian headquarters and an Urban Innovation Institute, this cluster would build on Toronto’s leadership in areas such as artificial intelligence and other technology specialties while supporting the growth — and invention — of new cutting-edge industries.

Villiers Island is uniquely situated to foster this kind of development. The proposed innovation campus would be located on the dramatic western edge, next to a new light rail stop, with enough space to accommodate new companies, start-ups, and institutions as the cluster grows. To the east, thousands of units of housing could be interlaced with retail, community, and cultural spaces, attracting companies seeking a high quality of life for their employees, who would be able to walk to work along the island’s innovative and intimate pedestrian-first street grid.

to the west in Promontory Park, which will offer spectacular views of the harbour and downtown skyline. To the north, Sidewalk Labs proposes to reinvent the Keating Channel — an artificial waterway lined with a series of industrial buildings — with repurposed historic structures and new pedestrian, public transit, and cycling bridges stitching together both sides of the canal, supporting a new creative economy centred around the arts, production, and exploration.

These diverse experiences could fuel each other, drawing workers and residents united by a shared commitment to exploring new ways of thinking, an excitement about the future, and a desire to be inspired, challenged, and surprised on a daily basis.

Cross section of the innovation campus

- Stoa
- Anchor tenant
- Multi-tenant





See the “Economic Development” chapter of Volume 1, on Page 420, for more details on plans to ensure that prosperity does not sacrifice equity or affordability.

The innovation campus would become the heart of a broader innovation ecosystem that extends across the Port Lands, building on Waterfront Toronto’s progressive work along the central waterfront; the bold thinking shaping the future of Quayside; and the innovation partnership between Toronto and Sidewalk Labs, which has the potential to set new standards for leveraging technologies to improve quality of life.

Anchoring the campus with a new Google Canadian headquarters.

To anchor this campus and catalyze this economic cluster, Alphabet commits to establishing a new Canadian headquarters for Google on the western edge of Villiers Island, as part of an agreed-upon transaction within the IDEA District.

Alphabet would target up to 500,000 square feet, which would be sufficient to accommodate as many as 2,500 jobs, the majority of which would be for Google employees (though actual hiring would depend on market conditions and business requirements).¹⁸

Fundamental to Google’s approach is the concept of a connected campus that encourages collaboration with neighbouring businesses, institutions, and communities. In the past, this approach has included maintaining active partnerships with local universities and supporting an emerging ecosystem of new small businesses, startups, co-working spaces, and anchor tenants.

Google’s arrival into an area has also supported the growth of local job and real estate markets. A Sidewalk Labs study of several U.S. cities found that Google’s arrival correlated with an increase in office value in the area, as well as an uptick in the local retail and residential inventory of 20 to 108 percent, above and beyond that of the rest of the city. In Chicago for example, the Fulton Market area experienced a 108 percent increase in office inventory, while growing office space value by 5.7 percent.¹⁹

More broadly, high concentrations of tech employment in cities have been demonstrated to increase the overall number of non-tech jobs as well, amounting to approximately five new non-tech jobs for every new tech job created.

Creating an Urban Innovation Institute to support Toronto’s leadership in this emerging field.

Additionally, Sidewalk Labs plans to work with universities and research centres to establish an Urban Innovation Institute — an applied research institute designed to bring together a wide cross-section of researchers, designers, engineers, and entrepreneurs to collaborate on ideas and technologies that drive urban innovation.

This emerging discipline studies how new technologies like ubiquitous connectivity, machine learning, sensing technology, and digital fabrication, along with new approaches to physical design, can help cities tackle tough challenges — leading to a projected market value of \$2 trillion

By the numbers:
→ Google Canadian headquarters up to 500,000 square feet
→ \$10 million in seed funding for new Urban Innovation Institute
→ \$4.3 billion in annual tax revenues by 2040

for the sector by 2025.²⁰ Toronto’s institutions are already leaders in the field, with more than 200 faculty and researchers dedicated to studying urban innovation and related areas of study at the University of Toronto alone.²¹

Envisioned by Sidewalk Labs as an independent non-profit, the Urban Innovation Institute can build on this progress. Sidewalk Labs would seek to work with Waterfront Toronto and local academic institutions to develop the plans and provide funding to support various development stages. Given the importance of the Urban Innovation Institute to the urban innovation ecosystem envisioned for the River District, Sidewalk Labs is prepared to provide \$10 million in initial seed funding (to be administered by an entity to be agreed-upon during the planning process), as well as to facilitate the provision of physical facilities for the institute within the Villiers West innovation campus.

Catalyzing development across the region.

This critical mass of innovative businesses animating the waterfront can attract more companies of all sizes seeking an environment that will spark new ideas, provide new opportunities for collaboration, actively support exploration, and inspire breakthroughs that lead to transformative change. As a result, this technology cluster could expand beyond the waterfront as Toronto builds on its burgeoning reputation and establishes itself as the intellectual capital for urban innovation.

As described further in the “Economic Development” chapter of Volume 1, a new Google Canadian headquarters on Villiers West can strengthen the growth of an innovation corridor between Toronto and Kitchener-Waterloo, which is home to a rapidly growing hub for technology, including Google’s largest engineering office in Canada. The proposed East Harbour Transit hub would provide a public transit connection for this corridor — supported by the extended waterfront light rail — enabling new opportunities to attract talent in both locations and reinforcing the region’s global leadership.

In the same way that Toronto’s MaRS Discovery District has created an economic incubator centred on medical research and advances, the proposed innovation campus can support businesses focused on advancing ideas, technologies, and products related to solving urban issues and to improving quality of life in cities.

Accelerating development through strategies like extending the light rail or securing an economic anchor tenant like Google could provide tremendous value to the city, as these impacts magnify exponentially over time. Sidewalk Labs estimates that this approach to the eastern waterfront could triple the number of jobs and housing currently projected by the city over the next 30 years. By 2040, the revitalized eastern waterfront could be generating as much as \$4.3 billion in annual tax revenues — more than seven times the city’s baseline estimates over the same time period.²²

Innovation campus: Active in all seasons

A view of the western edge of the innovation campus (looking west towards downtown).



Stitching this jobs hub into the community

Sidewalk Labs’ proposed innovation campus includes four newly created city blocks on the west side of Villiers Island, straddling New Cherry Street, and could total up to 1.6 million square feet of flexible commercial space. Each of the four sites includes the potential for buildings with very large floor plates (ranging from 30,000 to 90,000 square feet) to accommodate the types of open workspaces preferred by innovation economy companies.

The campus would feature a new pedestrian bridge connection to Quayside and have access to the rest of the city through the light rail extension, which would include a new centrally located station.

A key feature of the approved precinct plan is an east-west spine down the middle of Villiers Island called Centre Street, which forms the main connection between the residential community on the east side of the island and the new parks on the west side of Villiers, including Promontory Park, with its spectacular views of the harbour and downtown.

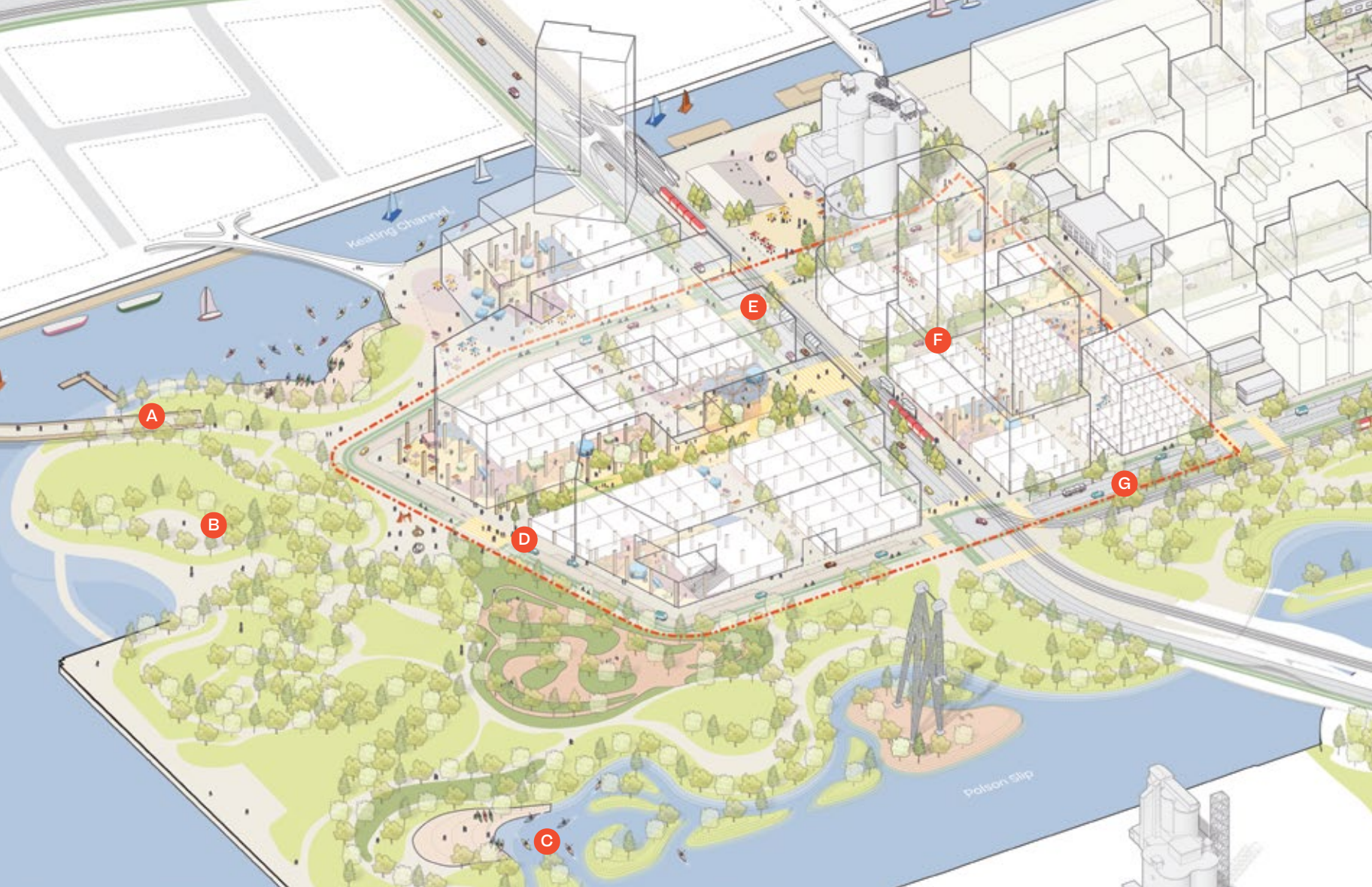
Centre Street would culminate in Promontory Plaza, a flexible space that transitions from mixed-use buildings to the park, supporting diverse programming that spills out from public ground floors. This flexible stoa space would host retail, production, arts, and community uses, with public passageways and interior arcades providing additional ways to move through the site.

The buildings themselves would embrace Sidewalk Labs’ adaptable Loft typology, which provides large floor plates for highly flexible uses.²³ The height, bulk, and design features of the buildings would be planned in consultation with Waterfront Toronto and the city to ensure that the innovation campus fits in with the scale of the rest of Villiers Island, which Sidewalk Labs would not be responsible for developing.

Planning Villiers West for access, connection, responsibility, movement, and adaptability.

Creating a truly mixed-use community can provide significant benefits for residents and businesses: saving time and money, and improving health, by enabling people to walk or bike to work; supporting vibrant retail and cultural experiences; providing public spaces that are activated year-round; and establishing a unique community character with a diversity of uses and voices.

Along with these benefits, there are challenges as well. Too often, commercial centres turn inward, encourage too much parking, or block vital pathways or views within a community. Avoiding these pitfalls requires creating foundational principles for good planning and making sure those principles are applied to the design of the commercial buildings.



Creating a connected innovation campus

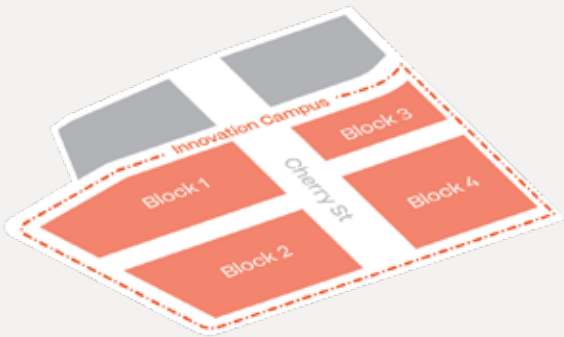
This jobs hub on Villiers West would become a true live-work neighbourhood through a set of features that include a new street network and a light rail connection that provide access to the surrounding city, an extensive park system, and mixed-use blocks.

New public spaces:

- A** Pedestrian bridge to Quayside
- B** Promontory Park
- C** Canoe Cove

New streets:

- D** Trinity Boulevard
- E** Cherry Street
- F** Centre Street
- G** Commissioners Street



In considering the location for the proposed innovation campus, along the blocks on both sides of New Cherry Street, Sidewalk Labs focused on developing a design proposal based on its core planning principles: access, connection, responsibility, movement, and adaptability.

Access.

Providing multiple modes of access is vital to any commercial centre. The campus’s location along New Cherry Street, a broad new boulevard, would allow easy access to the site by light rail, bicycles, and vehicles. Its wide, accessible sidewalks would connect with pedestrian walkways throughout Villiers Island, with footpaths through the adjacent public park, and with the new pedestrian bridges proposed by Sidewalk Labs that would connect Villiers back to Quayside and Keating West.

Connection.

The campus, located between Promontory Park and the residential sections of the island, should not interrupt the natural flow of a neighbourhood. Instead, it must act as a public connection point that knits the edges of the island together. By integrating the campus into the street network, with connections to the rest of the city running to and through the site, this hub can become a vital part of the community rather than a closed campus.

The most important connection is through the centre of the site, where Sidewalk Labs is proposing a wide, public walkway lined with commercial activity to the west of New Cherry Street, linking the residential community to the east with the public parks to the west.

In addition, New Cherry Street runs north–south through the site, ensuring easy connections through the technology campus from all directions.

Responsibility.

Sitting on a site adjacent to a major new park, the innovation campus has a responsibility to respect and enhance the public realm. The proposed plan would present low-scale massing along the edge of Promontory Park and significant features, such as seating areas and performance spaces, along the perimeter of the buildings to extend the public realm. The proposed plan also includes an opportunity to locate a public facility, such as a museum, at the base of one of the buildings, with easy access to the surrounding transportation network and parks.

Movement.

With high levels of access, broad and attractive connections through and around the site, strong retail and public programming at the lower levels of the buildings, and strategically located gathering places along the perimeter, the innovation campus would become a place of constant movement, with workers and visitors engaging with the site in different ways each day.

Adaptability.

The innovation campus is not conceived as a complex to house a single business. Although Google’s Canadian headquarters and the Urban Innovation Institute would be vital anchors, the campus is sized not only to allow for the growth of these anchor tenants over time but to accommodate many other businesses that may choose to locate there.

Sidewalk Labs anticipates that, combined, the Google headquarters and Urban Innovation Institute would occupy less than 50 percent of the commercial space within the campus. Planning for this extra space, and employing Sidewalk Labs’ building strategies for adaptable interior spaces, would permit these buildings to respond over time to accommodate the needs of current and future tenants.

The innovation campus would become a place of constant movement, with workers and visitors engaging with the site in different ways each day.

Beyond Villiers West: A Different Role for Sidewalk Labs

As explained on Page 260, in Quayside and Villiers West, Sidewalk Labs proposes to be the real estate developer in concert with local development partners, to prove out the market viability of innovations and to catalyze an economic engine. For the remainder of the River District, however, Sidewalk Labs proposes to take on a very different supportive role as Innovation and Funding Partner.

Starting in Villiers East, and extending to Keating, McCleary, and Polson Quay, Sidewalk Labs would focus on accelerating development and supporting public policy goals in the River District by serving as an

advisor on planning, design, and implementation; deploying a limited set of core technologies necessary to achieve key project objectives; and providing optional infrastructure financing support.

This role reflects Sidewalk Labs’ belief that the greatest cities are built from the community up and that its proposed innovation strategies for achieving public policy goals can only be successful if widely adopted by Toronto’s broader development and innovation communities.

Key Term
Public administrator

Sidewalk Labs proposes that government designate a public entity to serve — or in the case of Waterfront Toronto, continue to serve — as revitalization lead for the IDEA District.

In this role, Sidewalk Labs proposes to work closely with Waterfront Toronto and government partners on three areas of focus:

1

Planning, design, and implementation.
In this role, Sidewalk Labs proposes to help provide cutting-edge infrastructure and support development that meets agreed-upon guidelines and standards for innovation, with the goal of realizing key quality-of-life objectives around economic opportunity, affordability, mobility, and sustainability.

Building on the Quayside innovations, Sidewalk Labs proposes to prepare a set of “Innovation Design Standards and Guidelines” (IDSG) that can be used to ensure that all developments in the River District achieve the desired outcomes. The IDEA District’s public administrator would be responsible for overseeing the IDSG and ensuring their implementation as development proceeds.

2

Technology support.
In this role, Sidewalk Labs proposes to deploy a limited set of technologies required to achieve key project objectives — defined in Waterfront Toronto’s original RFP as “purposeful solutions” — including a dynamic curb that can adjust throughout the day to accommodate vehicle traffic or pedestrian uses, and a standardized mount system that can help catalyze digital innovation by third parties.

3

Infrastructure financing.
In this role, Sidewalk Labs proposes to provide optional support financing critical infrastructure, such as upfront debt service, to help ensure that the city and waterfront can invest holistically in systems that unlock the potential for future development.

See Volume 3 for more details on Sidewalk Labs’ proposed role as Innovation and Funding partner.

Vision for Villiers East: Achieving Key Public Policy Goals

Villiers East could become a demonstration ground for the roles that Sidewalk Labs proposes to play across the larger IDEA District, which includes helping to plan, design, and implement new infrastructure systems; applying a set of innovation guidelines to improve quality of life, and supporting planning efforts with a new digital tool.



Key facts:

Villiers East

Development timeline

2025–2029

Size

11.6 hectares

Total area

Roughly 4.15 million square feet

Next to the innovation campus described above sits Villiers East, an 11.6-hectare area surrounded by new parks on the east and south and bordered by the Keating Channel on the north.

While the River District can be defined by its progressive mix of uses, the precinct plan calls for Villiers East to feature a

higher concentration of residential development to support the economic development on the western side of the island. These buildings would be constructed by an array of third-party developers, with Sidewalk Labs supporting development as Innovation and Funding partner.



Helping to plan, design, and implement new infrastructure systems

Before development can begin, a comprehensive set of infrastructure systems must be established to support the thousands of new residents, workers, and visitors projected for the area. This area is where Sidewalk Labs believes it can help.

Sidewalk Labs would help to plan, design, and implement a set of advanced infrastructure systems in Villiers East — as with other neighbourhoods in the IDEA District — that support Waterfront Toronto’s priority outcomes, including for new mobility options and a climate-positive community.

As Innovation and Funding Partner, Sidewalk Labs would help to develop an “Infrastructure and Transportation Master Plan” that sets the guidelines for the types of systems required and identifies and supports pathways to implementation.

Creating new mobility networks.

As described on Page 254 and in the “Mobility” chapter of Volume 2, Sidewalk Labs intends to support the extension of the public transit system into Villiers and across the eastern waterfront. Once travellers arrive in Villiers, their daily experience would be shaped by the street network.

Sidewalk Labs believes that the mobility strategies outlined in this proposal — such as expanding transportation options

and planning for the future adoption of self-driving vehicles — can be the basis for significant changes to the street grid that create even more opportunities to support a people-first public realm and a new mobility network. Villiers East can serve as a global showcase for integrating self-driving vehicles into the urban environment at a district scale.

While Sidewalk Labs would propose to maintain the precinct plan’s high-volume boulevards and public transportation routes along New Cherry and Commissioners Streets, the interior streets on Villiers Island could be rethought to remove on-street parking, increase space for pedestrians and bicycles, and limit vehicular access to emergency, special access, and self-driving vehicles only.

This approach would have significant impacts on how each street looks and feels. The entire centre of Villiers Island could become a pedestrian zone, while maintaining access by multiple modes of transportation along the perimeter as well as by slow-moving self-driving vehicles within the interior. Centre Street could be configured as a crooked street, designed to block winds in winter and provide a wide pedestrian boulevard-like experience featuring all the signature street features initiated successfully in Quayside. At a size of 19 total hectares,



Map Proposed Villiers East street network

Villiers East could feature a people-first street network designed around Sidewalk Labs’ four proposed street types.

Boulevards are designed primarily to accommodate longer-distance car trips and faster traffic.

- A Cherry Street
- B Commissioners Street

Transitways are designed to prioritize public transportation in designated lanes.

- C Villiers Street

Accessways are designed primarily for cyclists, with traffic moving at bike speeds.

- D Old Cherry Street
- E Foundry Street
- F Munition Street

Laneways form the foundation of the pedestrian network, with all traffic moving at pedestrian speeds. A subset of Laneways — pedestrian-only **pedways** — would add yet another dimension to the walking network.

- G Centre Street
- H Interior block pedways



See the “Innovation and Funding Partnership Proposal” chapter of Volume 3 for more details on proposed advanced systems.

Villiers Island is a perfect size for a pedestrian-focused community, with no location more than a five- to six-minute walk from the centre of the island.

Supporting advanced infrastructure systems and climate-positive development.

Building a climate-positive neighbourhood requires a wide variety of strategies — from low-energy buildings to digital management tools — but none is more critical than the provision of advanced infrastructure designed to manage the use of energy, natural resources, and waste as efficiently as possible.

At Villiers Island, both west and east, Sidewalk Labs would work with Water-front Toronto to identify and establish specifications and a path to implementation for each infrastructure system.²⁴ Those systems include:

Thermal grid. A district-wide thermal grid would draw on clean energy sources, such as wastewater facilities, to provide heating, cooling, and domestic hot water.

Advanced power grid. An advanced power grid would use solar energy, battery storage, and time-based energy pricing to reduce reliance on the main power grid during periods of peak demand and make an all-electric community affordable.

Smart waste system. To improve recycling and divert landfill waste, a smart disposal chain would feature real-time feedback to improve waste sorting; “pay-as-you-throw” chutes to reduce household and business waste; and an underground pneumatic tube system to

keep these waste streams separated until they reach a collection facility.

Active stormwater management.

A coordinated network of green infrastructure, including street plantings and bio-retention zones, combined with active management using digital technologies, would improve stormwater retention and contribute to a greener public realm.

Freight delivery. A centralized freight system would deliver packages directly to buildings via self-driving delivery dollies, reducing truck trips from local streets.

Ubiquitous connectivity. A fibre-optic system would take advantage of recent advances to deliver secure and reliable connectivity at maximum speeds and affordable costs.

Additional systems. Additional systems could include tie-ins to existing Toronto-wide utilities, such as water and sanitary sewer connections.

Ongoing exploration. In addition to these systems, Sidewalk Labs intends to evaluate alternatives in the hopes of developing a holistic network of advanced infrastructure systems that ensures a high degree of future flexibility, provides access for a wide range of service providers, and allows for easy, inexpensive maintenance and upgrading of systems. Sidewalk Labs is specifically considering models that would encourage service providers of all sizes to access shareable space, with easy access to complementary systems and to users.

Villiers East can
serve as a global
showcase for
integrating self-
driving vehicles
into the urban
environment.

Applying innovation guidelines at Villiers East to transform streets and buildings

Innovation guidelines can be a critical tool to ensure that the River District achieves the development objectives established by Waterfront Toronto and the city. As a wide array of developers assumes responsibility for designing and building projects throughout the district, innovation guidelines would inform issues ranging from street design to sustainability. They would include technical specifications, design intentions and requirements for buildings and public spaces, and program details to shape how future development is coordinated with infrastructure.

These guidelines would be developed collaboratively between Waterfront Toronto, Sidewalk Labs, and the City of Toronto, and would be responsive to new ideas and technologies as they are proven out in Toronto and beyond.

While the details of the innovation guidelines would be developed over time, the initiatives proposed by Sidewalk Labs across the different urban innovation areas could form the framework, producing successful neighbourhoods that have a unique look and feel while striving to improve the quality of life for residents, workers, and visitors.

The following diagrams illustrate how adopting a few specific elements of transportation planning and urban design within the guidelines could have a significant impact on the physical qualities and experience of the Villiers East neighbourhood.



1 Precinct plan (blocks only).

“Villiers Island will contain a fine-grain network of local streets, with a variety of street types, each contributing to a sense of place and character of the island. Local streets will prioritize non-vehicular movement and flow.” — Villiers Island Precinct Plan



2 Creating more intimate, people-first blocks.

Sidewalk Labs believes that expanding mobility options beyond private cars and integrating self-driving vehicles into the urban environment can drastically reduce the need for on-site building parking, allowing for smaller blocks with public courtyards connected by a network of pedestrian walkways.



3 Generating a more dynamic, varied streetscape.

Sidewalk Labs’ proposed flexible low-floor stoa space is designed to enliven streets by fostering a greater variety of experiences. New weather-mitigation tools would activate outdoor spaces for more of the year. At Villiers East, the stoa spaces could be designed around strategically selected streets and new interior courtyards to become centres of community life.



4 Maximizing building views and sunlight.

Sidewalk Labs proposes to make digital design tools available that can help planners and communities evaluate multiple design options to maximize positive outcomes, such as sunlight on streets, open spaces, and views. Sidewalk Labs envisions sustainable timber buildings throughout the neighbourhood, which can be designed and built more quickly than traditional buildings, and provide significant benefits to public and environmental health.

Helping planners and communities improve neighbourhoods using digital tools

When designing a new neighbourhood, planners, architects, and community leaders have always struggled to balance competing objectives. Increased density can generate more jobs, affordable housing, and strengthened neighbourhood vitality — but it can also cause traffic congestion, block sunlight on or constrain public spaces, and result in poor views.

These choices require an ongoing conversation between the public sector and affected communities to establish shared priorities and determine appropriate trade-offs. But while every neighbourhood seeks to maximize benefits and minimize disruption, it can be difficult to assess the full impacts of any given decision. It can also be challenging to make technical planning concepts or guidelines clear and accessible so that communities can weigh in appropriately.

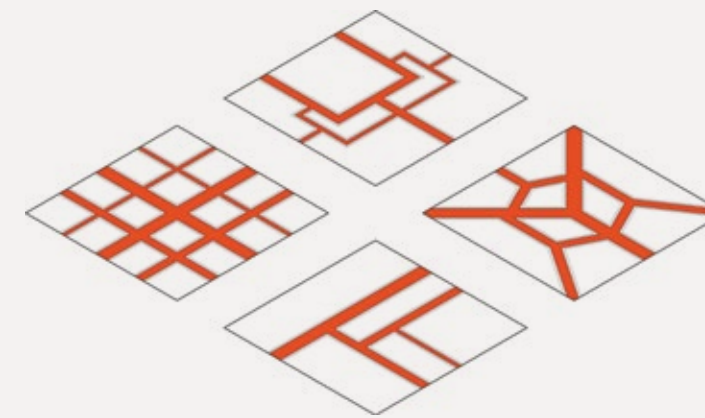
Sidewalk Labs believes that advances in technology and the application of data analytics, computer visualization, and machine learning can empower engineers, architects, planners, community groups, and policy-makers to collaborate more transparently and effectively on building better cities. Sidewalk Labs is developing a digital planning tool called “generative design” that could support this kind of planning effort.²⁵

Generative design is a tool that can help all stakeholders explore and assess design options based on a set of site conditions, constraints, and desired outcomes. It can be programmed to factor in all the components that determine the shape, character, and functioning of a place, such as the width and layout of streets, the shape and orientation of blocks, weather impacts, the height of buildings, and more. Advances in technology have made it cost effective to simulate millions of scenarios to determine which options perform best against a community’s stated goals.

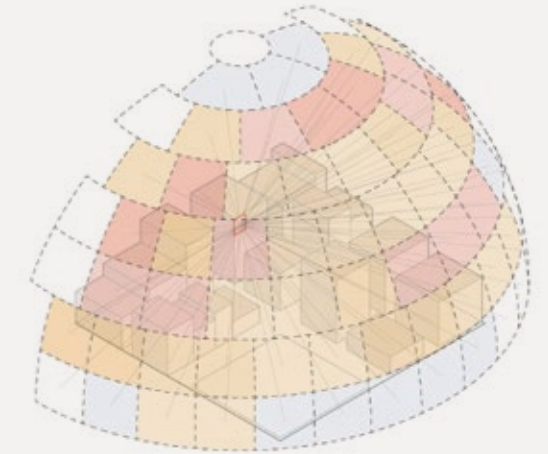
Generative design does not provide answers — on the contrary, it helps people weigh competing objectives and assess potential trade-offs. For example, smaller parks and an irregular street grid can help slow down wind gusts, an important goal in a cold climate like Toronto’s. But people need large parks as well as small ones, and straight streets can be useful. Which design is best? By showing 3D visualizations of the streets and calculating how each decision impacts a range of metrics, the generative design tool can provide reliable information so that these difficult public decisions can be made in an open, transparent, and understandable manner.

Using digital tools to assess thousands of options

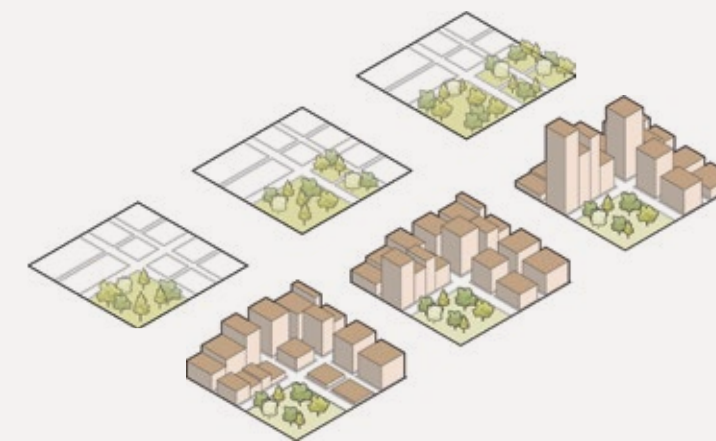
Generative design can help planners and communities evaluate a range factors individually and as part of an integrated plan, including those shown here.



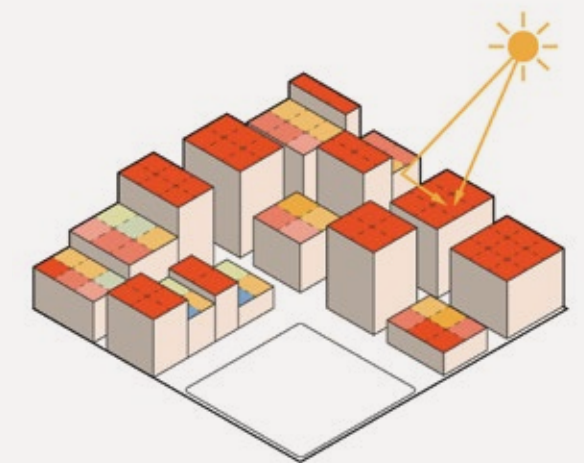
Potential street grids can be explored to help achieve goals such as building access or provision of open space.



Amount of daylight access on streets or open spaces can be explored to help ensure that buildings do not block public spaces from the sun.



Distribution of open space can be explored to balance goals around density and per capita access to green space.



Solar energy yields created by different building orientations can be explored to help communities pursue sustainability goals, such as the ability to generate clean energy on site.

This focus on information and outcomes could open up new possibilities within the regulatory framework to create a performance-based system built around specific targets that are often difficult to achieve through traditional zoning.

In its role as Innovation and Funding Partner (see Page 314), Sidewalk Labs would make these resources available to Toronto planners and the City of Toronto to help create an evaluation framework that could assist in the application of the Innovative Design Standards and Guidelines within the River District. This framework could help ensure that the wide variety of developers, architects, and designers who will be responsible for building out the River District over time will maintain flexibility and creativity in developing new ideas while at the same time ensuring that their proposals achieve key public interest objectives for the River District.

Case study: Applying generative design to Villiers East.

In Villiers East, the existing City of Toronto precinct plan calls for dense housing to support the economic development on the island’s western half. That goal requires finding a balance between the desired density of development while ensuring extensive, high-quality open space to support residents, visitors, and workers.

As planning proceeds in Villiers, the generative design tool can help planners evaluate the performance of different options by running thousands of simulations that weigh factors like building massing, access to natural light, and wind.

One strategy proposed by Sidewalk Labs to achieve these goals involves breaking down the development blocks into a series of small buildings with pedestrian courtyards, creating more intimate environments for residents to mingle. As a test, Sidewalk Labs used its generative design tool to conduct a preliminary study of possible courtyard configurations for a two-by-two block area of Villiers, aiming to optimize for three variables: percentage of open space, sunlight access in the courtyard, and density (gross floor area).

In an initial run, the tool generated and analyzed thousands of permutations and surfaced roughly 400 plans that created more open space and allowed more sunlight to reach the streets than the precinct plan baselines — while also adding more density (see visuals).

Generative design can also evaluate district-wide impacts, giving communities the information to take a more active role in shaping their environment. In the end, if generative design does its job, neighbourhoods would work and feel better, because they would more fully achieve the values and priorities of the city.

Generative design case study: Villiers East

A generative design analysis of a two-by-two block in Villiers Island produced roughly 400 plans (out of thousands of permutations) that created more open space, daylight access, and density than the existing precinct plan.



Precinct plan

Open space	45.3%
Daylight access	49%
Total GFA	1,513,144 ft²



Generative design #00530

Open space	5.2% increase
Daylight access	13.6% increase
Total GFA	+24,243 ft²

This run was created through making marginal changes to the precinct plan; it has small increases in open space and density, and a large increase in daylight access.



Generative design #00469

Open space	3.31% increase
Daylight access	20.61% increase
Total GFA	+196,710 ft²

This run was created through making moderate changes to the precinct plan; it has a small increase in open space, a medium increase in density, and a large increase in daylight access.



Generative design #01140

Open space	12.6% increase
Daylight access	8.6% increase
Total GFA	+496,781 ft²

This run was created through making significant changes to the precinct plan; it has a medium increase in daylight access, and a large increase in open space and density.

Vision for Keating Channel: Reclaiming a Historic Canal

This historic channel could stitch together the waterfront to create a new kind of urban environment that blends innovative economic development, art, culture, restaurants, retail, and production.



Key facts:
Keating East

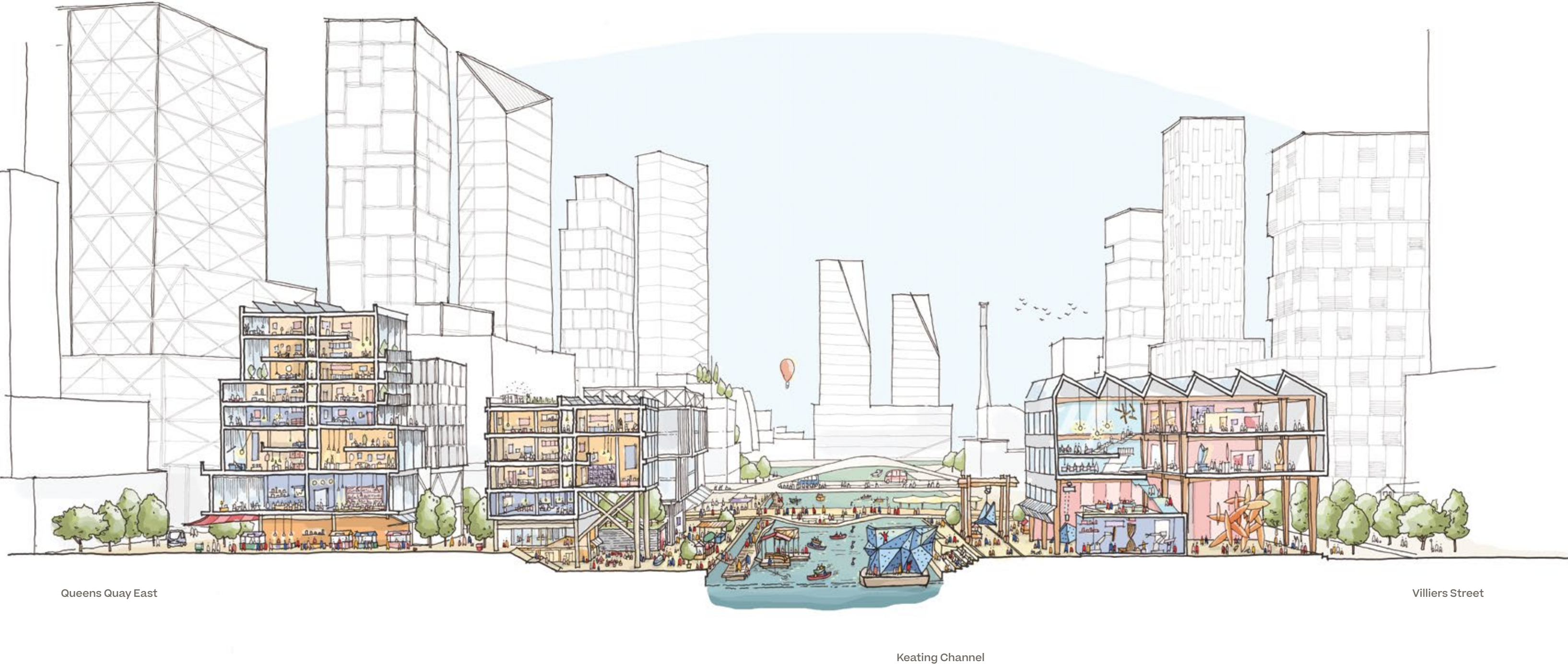
Development timeline
2029–2033

Size
5.9 hectares

Total area
Roughly 3.45 million square feet

As home to the new Google Canadian headquarters, Villiers Island is envisioned as a major economic engine for the western Port Lands, but the economic development opportunities would not be limited to the innovation campus. Villiers Island’s unusual geography and the historic buildings and structures remaining from its industrial and maritime history provide the framework for an additional, entirely different, economic driver.

Great cities around the world, like Rotterdam in the Netherlands and Nantes in France, have reclaimed post-industrial waterfront sites to build new neighbourhoods centred around art, creativity, production, and the creation of an experimental culture that attracts residents and visitors from the local region and beyond. These successful developments share a common approach: they capitalize on the physical features of their sites and draw on the culture of their cities to invent new approaches to urban living.



With the renaturalization of the Don River, the Keating Channel — built in 1915 as the hard-edged connection between the river and Lake Ontario²⁶ — can be reclaimed as an urban canal, forming the unifying feature of a new neighbourhood dedicated to creativity and innovation.

Developing both sides of the channel.

Transforming this historic waterway will require innovative approaches to infrastructure and mobility, public space, buildings, and development. The key to success will be ensuring that both sides of the channel create a unified centrepiece that links Villiers Island with the Keating neighbourhood, as envisioned in the Port Lands Planning Framework.

On Villiers Island, the historic structures scattered along the channel’s edge create an opportunity for non-traditional uses. They could be reclaimed for small-scale arts and fabrication, while a large open plaza could be home to Sidewalk Labs’ adaptable stoa concept, hosting a wide range of cultural and public programs. Across the channel, Keating could host small-scale workshops and artist studios, stores, kiosks, and restaurants.

Low-scale buildings on both sides of the channel could provide an intimate setting along the waterfront, which could be connected by new pedestrian and bicycle bridges and a continuous promenade along the water’s edge. The public realm could extend onto the water itself, which could host a series of floating barges for cafés, art installations, and recreational activities.

This new exploration zone could host an ever-changing series of events and installations and could capture the spirit of a district built around innovation. As Villiers Island develops over time, the early activation of the Keating Channel zone with temporary uses and special programming to draw people to the site could help to establish the area as a place where new ideas are welcomed and celebrated.

Keating: A vibrant new community connected to Villiers Island.

Keating is currently isolated on all sides by the Gardiner Expressway, a railway yard, and railway tracks. In November 2017, the Province of Ontario approved the City of Toronto’s plans to relocate the parts of the Gardiner and Lake Shore Boulevard that currently run along the Keating Channel and move them adjacent to the train infrastructure on the neighbourhood’s northern edge. That would still leave one side of the neighbourhood inaccessible to the surrounding city but would create possibilities for a new community that embraces the Keating Channel and connects to the Distillery District to the north.

A thoughtful use of scale could minimize the lack of connection to the northern edge and reorient development towards the water. Dense residential towers along the highway could scale down to an intimate presence at Keating Channel, providing easy access to the culture, retail, and community spaces lining both sides of the waterfront.

A new arts and
production
exploration zone
along Keating
Channel could
capture the spirit
of a district built
around innovation.

Vision for McCleary: Creating a Model Live- Work Neighbourhood

Nestled between the projected 8 million square feet of commercial development at East Harbour, Toronto’s burgeoning Film District, and the urban innovation hub at Villiers, McCleary could bring thousands of jobs within a short distance of its new residents.



Key facts:
McCleary

Development timeline
2028–2032

Size
13.6 hectares

Total area
Roughly 6.7 million square feet

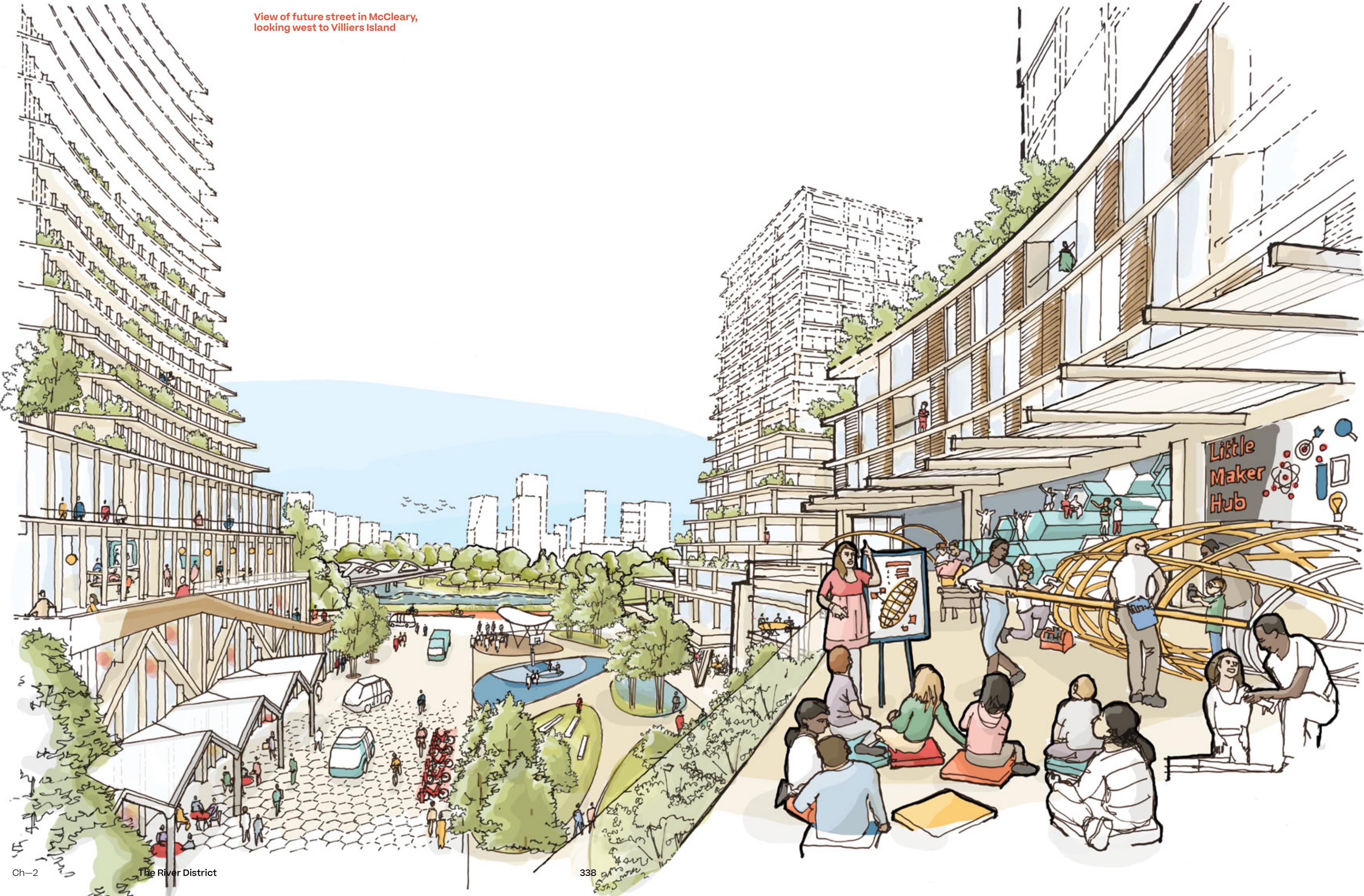
McCleary could become a critical link within the developing eastern waterfront given its proximity to three major job centres, the new planned GO Transit station and Ontario Line,²⁷ and new public destinations like the park network surrounding the Don River.

This central location makes McCleary uniquely capable of supporting the planned East Harbour commercial district to the north, the expanding Film District to the south, and the innovation

campus at Villiers Island to the west through a dense, mixed-use development plan that could include housing for potential workers, along with commercial and production spaces that could complement the work at each economic hub.

With its mix of housing, new jobs, and striking public spaces, McCleary could embody the model for a sustainable community, supplying a labour force of thousands of residents who can walk or

View of future street in McCleary, looking west to Villiers Island



McCleary could
feature up to
7,000
housing units.

bike to jobs within minutes and creating a healthier lifestyle that minimizes commute times and costs, as well as the need for on-site parking.

Expanding affordable options for the local labour force.

Dense residential development, which could include up to 7,000 units, would enable McCleary to offer prospective residents a broad variety of housing types and ownership models, creating an inclusive and diverse community.

The tallest buildings and greatest numbers of residents could be concentrated along the neighbourhood’s northern edge, adjacent to the 8 million-square-foot East Harbour development. As the neighbourhood approaches the waterfront, the buildings could scale down to integrate into the mixed-use waterfront community.

An expansive, animated public realm network could connect the Don River at the western edge of the neighbourhood to the expanded McCleary Park at the eastern edge. The Port Lands Planning Framework calls for the park to be reconfigured and expanded to support further recreational activities and to seamlessly integrate with the revitalized Commissioners Incinerator building, which could serve as a district-wide community centre.

Complementing surrounding areas with a unique mix of spaces.

Consistent with the Port Lands Planning Framework’s identification of the area as a Production, Interactive, and Creative (PIC) mixed-use area, McCleary would also host a mix of commercial spaces that complement — rather than compete with — the adjacent developments, particularly the film district.

That could include businesses such as production facilities, light industry space for set or costume design, or offices for technical arts like sound engineering. In fostering film-supportive housing and businesses, Sidewalk Labs believes McCleary can serve a significant role in supporting the ongoing expansion of the film industry.

Supporting the precinct planning process.

The final vision for McCleary requires a comprehensive precinct planning process. Under Sidewalk Labs’ proposal, this effort would be conducted as a joint exercise completed by Waterfront Toronto and the City of Toronto, with Sidewalk Labs in the role of innovation partner. A range of private developers, engaging their own architects and designers, would then be selected by the appropriate public agency to construct the actual buildings.

With its mix of housing, new jobs, and striking public spaces, McCleary could become a critical link to support three major surrounding job centres.

Vision for Polson Quay: Reinventing a Working Waterfront Neighbourhood

Polson Quay could capitalize on its unique economic and recreational potential by creating a waterfront community that integrates housing, creative production and commercial space, and a spectacular public realm network that spans land and water.



Key facts:
Polson Quay

Development timeline
2030–2034

Size
23 hectares

Total area
Roughly 9.75 million square feet

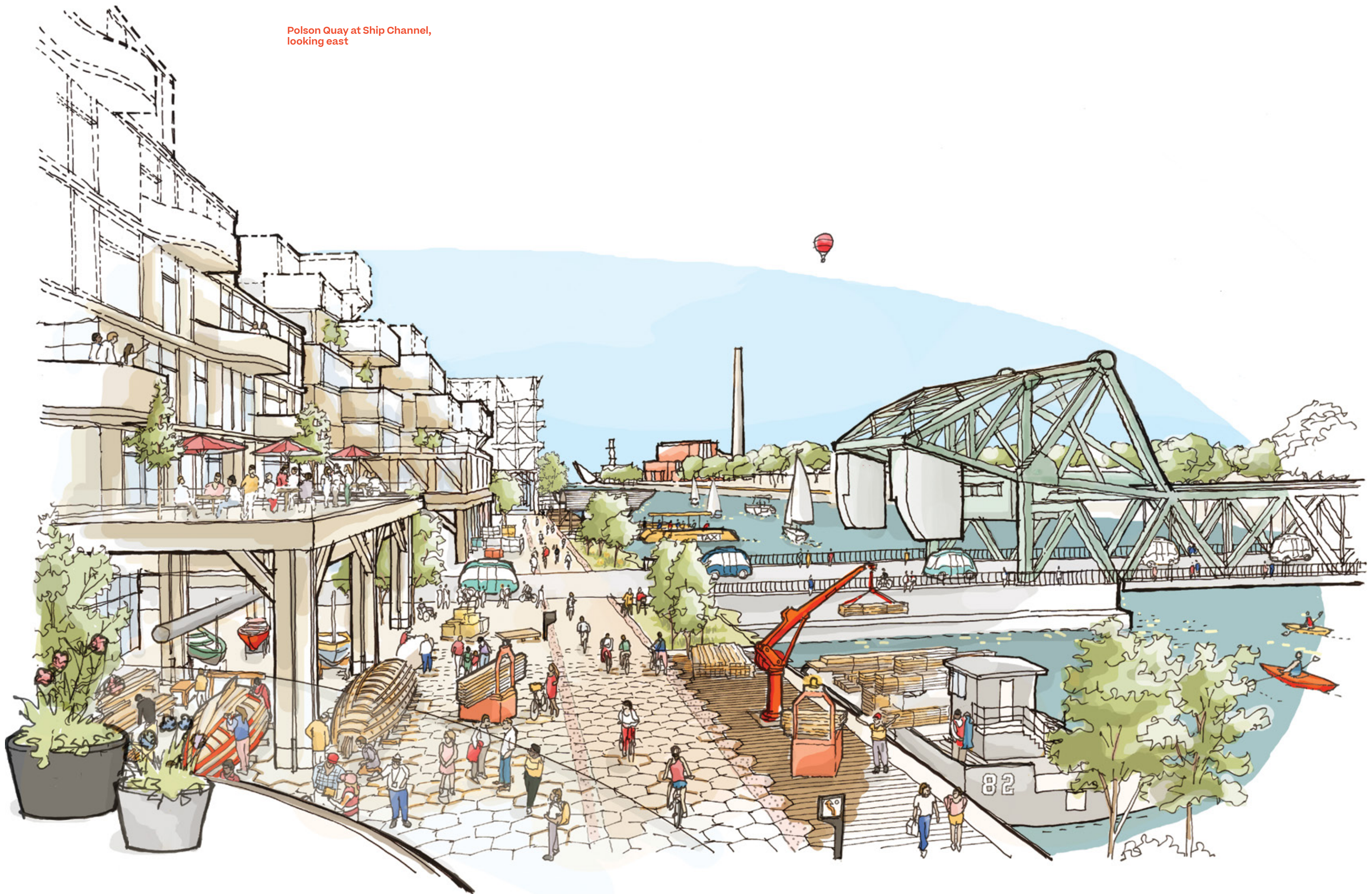
The final piece of the River District to be developed would be Polson Quay, a 23-hectare peninsula surrounded on all sides by water or wetlands — and the only neighbourhood in the eastern waterfront with buildings directly bordering the harbour.

This area includes the Polson Quay and South River precincts identified in the Port Lands Planning Framework. Treating them as a unified neighbourhood would recognize the shared opportunity across

both sites to develop a comprehensive plan to spur economic growth while enlivening the area through a vast new network of parks and public space, ample housing, artisan workshops and production spaces, and unusually intimate waterfront access.

This development can support the inspiring work of the artists, designers, and other makers who inhabit the historic Dominion Box Boards to forge a creative enclave.²⁸ This heritage structure can

Polson Quay at Ship Channel,
looking east



become the heart of a fully revitalized neighbourhood, with the existing tenants continuing to play a major role in the community.

The density and diversity of programming at Polson Quay would be supported by an extension of the light rail, with a new stop planned for the neighbourhood’s centre.

Reinventing the working waterfront as a modern mixed-use community.

With its unique waterfront setting — encompassing an active shipping channel, the harbour, and the renaturalized Don River — Polson Quay has an opportunity to reimagine the city’s relationship to water.

As the only neighbourhood in the River District with buildings along the inner harbour, Polson Quay could enable maritime uses that coexist with a spectacular new public realm created by the flood protection plan. That project will create an urban esplanade that curves around Polson Quay and connects to a new central park that stretches between the edges of Villiers and Polson Quay, with pedestrian trails winding through the wetlands.

Sidewalk Labs proposes an additional pedestrian bridge at the western edge of Polson Quay, which would connect this area with the technology campus and showcase exceptional views of downtown, Lake Ontario, and the Toronto Islands, enabling people to walk one continuous path from Quayside to the stunning new parks on Villiers Island and Polson Point.

On its southern side, Polson Quay borders the Ship Channel. Boats could become part of the neighbourhood’s daily life as sources of transport, recreation, and shipping to support light industry.

Polson Quay could modernize the concept of a working waterfront, with workshops for active and adaptable light industry and production spaces integrated into the streetscape alongside housing, parks, and shops. These workshops could become a foundational part of the neighbourhood’s identity.

A range of housing options, including new live-work spaces and affordable rentals, could be designed to meet the diverse needs of people working in production, industrial, or port uses across the Port Lands.

Supporting the precinct planning process.

Similar to McCleary, Polson Quay will require the creation of a precinct plan to guide its development. This planning process would need to grapple with some of the unique constraints of the site as identified by the Port Lands Planning Framework, including the Cement Terminal and nearby port and industrial uses, which could pose substantial issues to Toronto’s vision for integrating housing alongside industry.

As innovation partner, Sidewalk Labs can provide new technologies to help city planners assess which of these uses are compatible and which should



See the “Buildings and Housing” chapter of Volume 2 for more details on the proposed outcome-based code system.

be relocated to preserve the mixed-use community. Once the neighbourhood is developed, digital tools could help support an ongoing evaluation to ensure that the mix of uses is successful. For example, the proposed outcome-based building code system can provide real-time monitoring and management of environmental concerns, such as noise, odour, and vibrations.

For industrial uses that are deemed incompatible with the mixed-use community, Sidewalk Labs can help craft a transition strategy to explore their relocation.

As with the rest of the River District, Polson Quay’s range of private developers would all be required to meet the district’s Innovative Design Guidelines and Standards to ensure that the neighbourhood meets world-leading standards for sustainability, affordability, and advanced systems and becomes a fitting culmination to an extraordinary district.

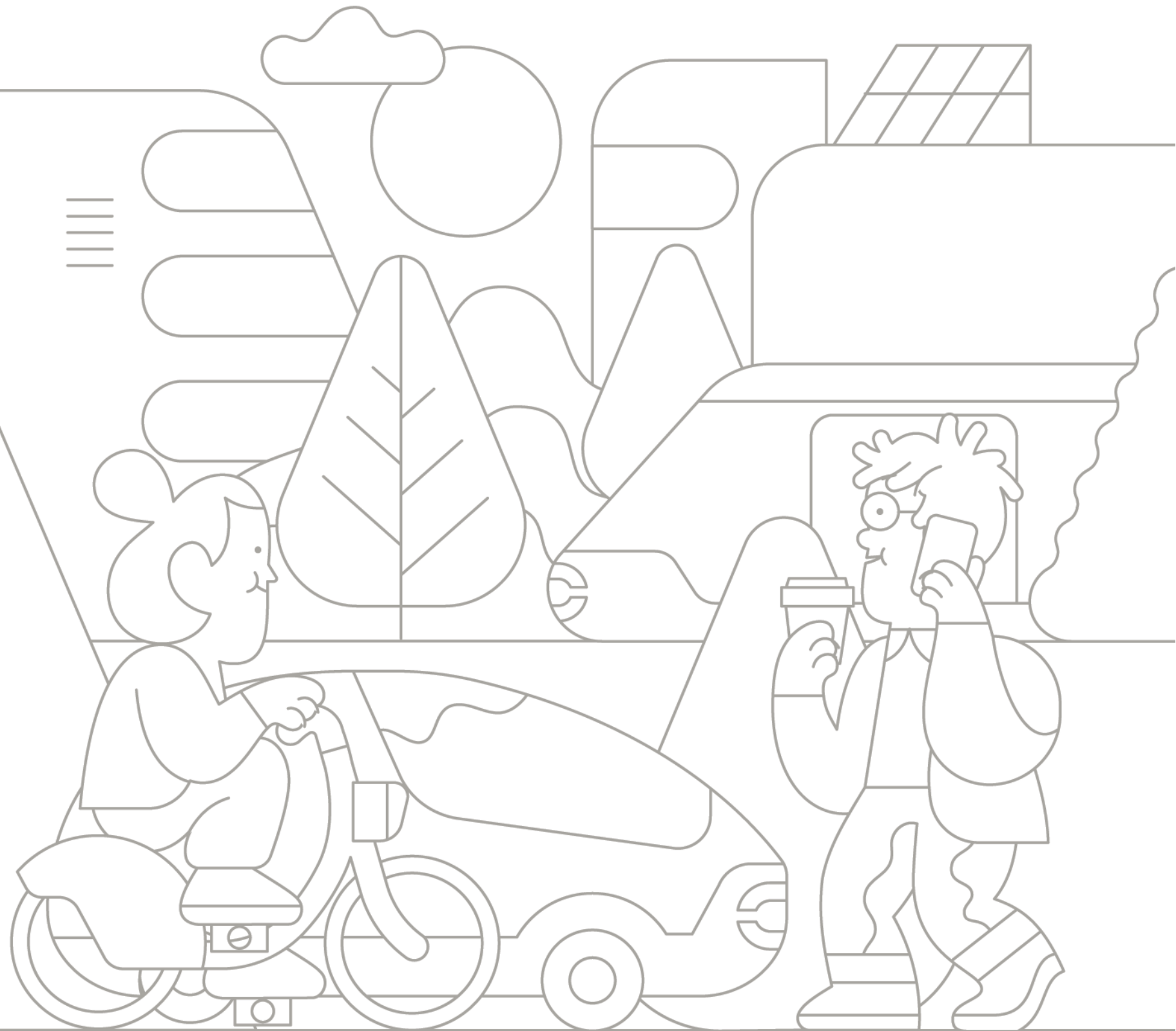
Polson Quay could modernize the concept of a working waterfront, with workshops and production spaces integrated into the streetscape alongside housing, parks, and shops.

Scaling Urban Inno- vations

The following section describes how innovations initiated in Quayside can scale across the River District. As described more in Volume 3, Quayside becomes possible only when considered in combination with the River District.

Such scale is necessary for many of the innovations to become financially viable and to maximize their ability to help achieve Waterfront Toronto's core outcomes around job creation and economic development, sustainability and climate-positive development, housing affordability, new mobility, and urban innovation (including robust data privacy and digital governance).

Mobility



Accelerating mass transit extensions across the eastern waterfront

The River District’s scale makes it possible to realize a long-planned light rail extension across the eastern waterfront through a self-financing mechanism, accelerating transit-centred development that would create more affordable, convenient, and sustainable neighbourhoods.

Toronto’s leaders have long understood that planning for public transportation in tandem with the initial development of the eastern waterfront is essential to the area’s success. Without that service, travel options to the area would be limited and the vision for the Port Lands as a significant economic driver for Toronto’s future would be impossible to realize. Development would become overly reliant on road infrastructure, in contrast to city and waterfront objectives around sustainable mobility.

There is also widespread agreement about the path forward: the city’s 6.5-kilometre light rail extension across the eastern waterfront that would provide dramatic benefits, such as reducing traffic and greenhouse gas emissions, attracting commercial tenants, opening up the

neighbourhoods to a broader range of residents, and accelerating development. The city’s proposed extension would even improve transit service and travel times, with smarter spacing between stops, signal prioritization, and dedicated transit lanes.

Ultimately, this plan could become the foundation for a reconceived mobility network that prioritizes pedestrians, bicycles, and transit, providing exciting possibilities for neighbourhoods that are safer, more affordable, sustainable, and convenient.

But more than a decade after planning began, the light rail plan, which could cost approximately \$1.2 billion, remains unfunded — with no clear path to implementation.²⁹



See the “Mobility” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Mobility” section.

The River District is ideal for self-financing. Sidewalk Labs believes that a proven financing mechanism of self-financing, sometimes referred to as “value capture,” could finally make this project a reality if governments should not be willing or able to fund from more traditional sources. In this approach, the light rail would essentially fund its own extension, using the projected revenue streams from the future development — made possible by the new transit lines — to finance the upfront construction costs.

Such an approach has been used in Canada before, in Calgary and Winnipeg,³⁰ and has been proposed to offset the cost of Toronto’s SmartTrack plan to electrify and add new stations to Toronto’s surface-rail network. When applied to the eastern waterfront, it would allow construction of the light rail to proceed as development begins, while limiting the amount of direct public funding required.

This self-financing strategy is only viable for certain projects.³¹ The key issue is whether the transit expansion will create enough value to offset the cost of building that expansion. The strategy is often not viable where new transit will serve existing neighbourhoods, because those areas are already sufficiently valuable, meaning that new transit services do not add much. Likewise, a low-density development might not generate enough revenue to cover the high costs of transit infrastructure.

A small neighbourhood such as Quayside, consisting of just a few blocks, could never repay the massive investment required. But the River District provides the potential for enough new development at high enough density to design and fund a rapid transit system that can nourish new neighbourhoods and support their growth.

The approved extension would include up to 19 new stops across a route that connects Quayside, Villiers Island, McCleary, and Polson Quay with the newly planned East Harbour station and the rest of the city.

The LRT extension can unlock massive economic opportunity. In addition to becoming financially feasible at scale, the sweep of the proposed transit extension also delivers greater benefits: adding multiple lines crossing the eastern waterfront delivers access and service to riders that a one-or-two-stop extension does not.

An economic impact report prepared by the engineering and development consultancy Hatch for the Waterfront Business Improvement Area showed that construction of the light rail through Quayside and the River District would generate land value of \$4.5 billion between 2025 and 2045 and \$22.8 billion in additional tax revenue to the governments of Toronto, Ontario, and Canada over the 20 years following completion of the project.³²



Map

Proposed light rail network in the River District

Sidewalk Labs proposes to accelerate the completion of the city’s planned light rail extension, with an additional optional segment through Keating Channel. This would unlock new development and create essential connections to the rest of the city.

- IDEA District
- Existing and planned rapid transit lines
- Approved light rail extension
- Optional light rail extension
- 5-minute walk from new light rail stops
- Planned East Harbour station



See the “Innovation and Funding Partner Proposal” chapter of Volume 3 for more details on optional financing support for the light rail extension.

Beyond the approved plan, Sidewalk Labs further proposes an optional second phase of construction to add light rail infrastructure to the area north of the Keating Channel to serve future development.

By 2041, these extensions could serve roughly 72,900 Torontonians and would have a significant economic impact.³³

Given the project’s fundamental importance, Sidewalk Labs is prepared to provide certain assistance with the financing for the approved plan.

Relying more heavily on public transit dramatically reduces greenhouse gas emissions, forming a critical step in the path to a climate-positive community.

Strengthening public transit across the eastern waterfront unlocks virtually every goal held by Toronto for its waterfront. Street space can be reclaimed to create a larger, more vibrant public realm that anchors new communities.

Reducing the expenses associated with car ownership supports more affordable lifestyles,³⁴ making the eastern waterfront accessible to more people. Relying more heavily on public transit dramatically reduces greenhouse gas emissions,³⁵ forming a critical step in the path to a climate-positive community.

The River District could support enough density to design and fund a rapid transit system that could spur new, thriving neighbourhoods.

Creating new neighbourhoods with people-first street networks

Planning for the eventual adoption of shared self-driving vehicles has the potential to reshape streets into people-first mobility networks by dramatically reducing parking and increasing space for pedestrians and cyclists.

The way space is allocated within a typical city street rests on a few assumptions. One is that private cars are the primary way people get around and that they therefore deserve the most space. Another is that those cars are driven by people who, often distracted or driving too fast, pose a significant danger to others and therefore should be permanently separated from other modes of transportation.

The result is a city street where cars have wide rights of way that are marked off with curbs. Cyclists and pedestrians have to squeeze into the spaces on the margins while public transit gets stuck in traffic even though its vehicles carry scores of riders instead of just one.

Waterfront Toronto has built streets based on a different set of assumptions. One is that walking, cycling, and public transit are as important as private cars — and often more efficient. Another is that the more high-quality space provided on the street for each of these modes, the more all of them will be used, as shown by the unexpected high volumes of cyclists on the Martin Goodman Trail.³⁶

Sidewalk Labs embraces this vision and proposes to build on this work with an additional assumption: that self-driving vehicles — often called autonomous vehicles — will be both safe and commercially ubiquitous available for rides by roughly 2035, and that smart planning can harness their potential to be better neighbours for pedestrians, cyclists, and



Map Proposed street network in the River District

The proposed street network balances the need for longer trips by vehicles and public transit (on Boulevards and Transitways) with the need for streets that prioritize cyclists, pedestrians, and sidewalk activity (Accessways, Laneways, and the interior pedestrian network).

- IDEA District
- Boulevards
- Transitways
- Accessways
- Laneways
- Pedways
- Open space
- Pedestrian network
- Future neighbourhood street networks to be planned

public transit users. Self-driving vehicles can be programmed to drive more slowly and carefully, as well as to give priority to public transit, bicycles, and pedestrians.

The consequences of these assumptions are profound. By proactively shaping the ways that self-driving vehicles are integrated into city streets and by using a range of policy, pricing, and digital tools to encourage shared rides and prioritize public transit, cities can design streets for people.

This approach enables more space to be reclaimed for the public realm as well as more shared streets, where pedestrians can safely coexist with self-driving vehicles programmed to stay at certain low speeds. (The shared streets concept is already practiced successfully today with traditional cars, especially in Europe.)³⁷ To accommodate increased pedestrian traffic, city blocks can feature more extensive interior pathways and courtyards.

Smart planning can harness the potential of self-driving vehicles to be better neighbours for pedestrians, cyclists, and public transit users.

The ultimate goal is to build more active and engaging streetscapes. More space allows for more trees, public art, street furniture, and other amenities. This change can have a cascading effect. More amenities bring more people to the street, and having more people on the street improves the prospects and usefulness of local retail, which in turn draws more people in a virtuous cycle.³⁸ This approach can take one of the great joys of urban life — strolling down a lively street — and make that experience fundamental to every corner of a neighbourhood.

New street types for a balanced mobility network.

To realize the vision of a complete mobility network, Sidewalk Labs has designed four street types to balance the need to travel quickly and efficiently against the imperatives of pedestrian safety and enhanced street life.³⁹

Since Quayside is only four blocks long and includes three existing streets whose designs must be largely maintained, it is too small to implement these new street types and realize their full benefits. But the River District presents an opportunity to integrate this new people-first transportation network.

Four new street types can balance the need to travel quickly and efficiently with the need for pedestrian safety and enhanced street life.

Boulevard. The Boulevard is the widest street type, with a top speed of 40 kilometres per hour and a maximum width of 31 metres. Designed primarily to accommodate longer-distance trips for all modes, Boulevards would typically be situated along the perimeter of a neighbourhood. To help improve safety for all street users, Boulevards feature separated bikeways for cyclists and sidewalks for pedestrians.

Transitway. Like Boulevards, Transitways have a top speed of 40 kilometres per hour, but they have a maximum width of only 26 metres, with priority given to public transit. The Transitway features hubs for bicycles and scooters and safe, wide crosswalks, providing seamless cycling and walking access to stations.

Accessway. Accessways are narrower streets that serve as a core part of the cyclist network and are intended for traffic moving no faster than cycling speeds. The streets are designed for top speeds of 22 kilometres per hour and a maximum width of 16 metres. Self-driving vehicles are permitted on Accessways if travelling at bike speeds. Accessways do not have separated sidewalks but guide cyclists and pedestrians via lighted pavement or digital signs. Accessways would provide emergency access and servicing to buildings that are not otherwise accessible by Boulevards and Transitways.

Laneway and Pedway. These streets form the foundation of the pedestrian network and are envisioned as the most common type of street in Villiers, Polson Quay and McCleary. The only difference between them is that Laneways would allow vehicles travelling at walking speeds and Pedways would not. Laneways are designed for pedestrian speeds, with a top speed of 8 kilometres per hour and a maximum width of 11 metres. Bikes and self-driving vehicles for people with accessibility needs are permitted on Laneways if travelling at the proper speed.

Pedways are the courtyards located within blocks and walkways between buildings and should be open and inviting to residents and visitors. With no regular vehicular access, they would come in all shapes and sizes depending on the varied properties of a block (but would be sized to accommodate emergency vehicles). Both types are meant to help get people places but also to be places unto themselves: they can be quiet side streets where kids play or they can be filled with pop-up shops, street fairs, and other types of community gatherings. Linked with Pedways, Laneways could stitch together a continuous pedestrian-dominated network where it would be a pleasure to walk.

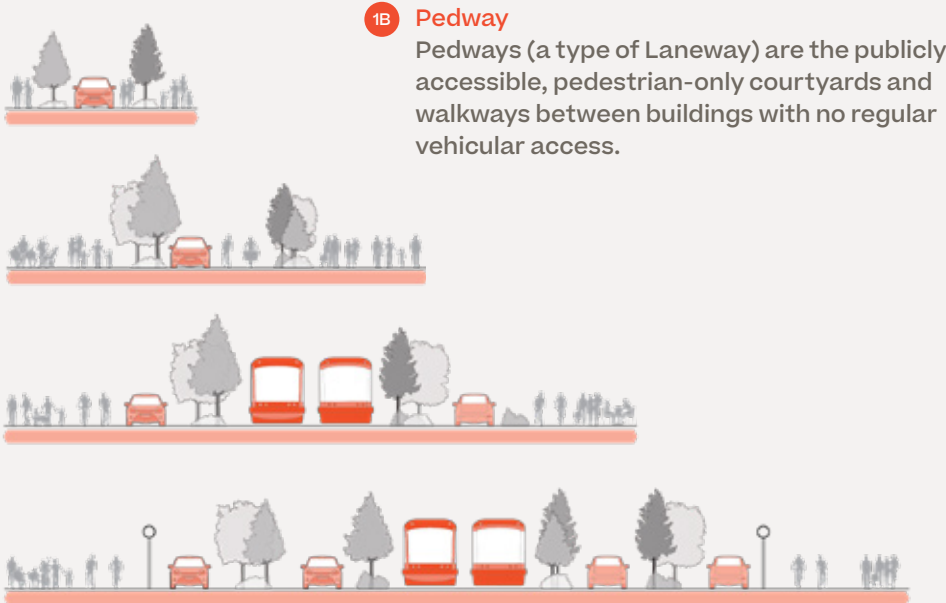


The four proposed street types

Villiers East offers an illustrative street network that incorporates all four proposed street types.

- 1A Laneway**
Width: 11 metres
Priority mode: Pedestrians
Priority speed: 8 km/h
- 2 Accessway**
Width: 16 metres
Priority mode: Cyclists
Priority speed: 22 km/h
- 3 Transitway**
Width: 26 metres
Priority mode: Public transit
Priority speed: 40 km/h
- 4 Boulevard**
Width: 31 metres
Priority mode: All modes
Priority speed: 40 km/h

* Atypical condition



Expanding opportunities for cyclists

To help cyclists reach higher speeds while improving street safety, the River District’s network would feature many separated cycling lanes, including the Martin Goodman Trail.

The district’s primary bike network would run on Boulevards, Transitways, and Accessways, including a newly proposed dedicated lane along the extension of Trinity Street, across a bike bridge over the Keating Channel, and through Villiers Island. Similar to Quayside, River District Boulevards and Transitways would feature separated bike lanes that are five metres wide and are equipped with heated pavement and “green wave” lighting that helps ensure cyclists can move through traffic lights safely and with priority.

On Accessways, bikes would be prioritized with centre-running lanes and share space only with other modes travelling at bike speeds. Accessways could offer a central heated running lane of three to five metres wide.

Outside of these areas, cyclists would be welcome to travel on the streets at the prevailing speed and, notably, at walking speed when in pedestrian areas.

All told, the district would feature extensive new dedicated bike infrastructure. Within the River District, the target would be for cyclists to be able to reach 100 percent of buildings using either a dedicated bike lane or a roadway designed for bikes, compared to roughly 15 percent in a typical downtown Toronto neighbourhood today.⁴⁰

Within the River District, cyclists would be able to reach 100 percent of buildings using streets designed for bikes or dedicated lanes.



Map Proposed bike network in the River District

The proposed bike network builds on the city’s existing network and planned expansions to create new cycling infrastructure that connects onto Villiers Island, including bike bridges.

- | | |
|---------------|--|
| Primary route | Secondary route |
| | |
| | |
| | |
| | |
| | |
| | Existing bike network |
| | City planned and proposed expansion of bike network |
| | Sidewalk Labs proposed further expansion of bike network |
| | Future neighbourhood bike network to be planned |
| | IDEA District |

A neighbourhood moved by new mobility

The forward-looking mobility systems of the River District would demonstrate the extraordinary quality-of-life benefits that come with designing a transportation system that can adapt to the changing needs and technologies of the 21st century.

The most visible changes in urban mobility in the 21st century so far have been the emergence of ride-hailing, the rise of bike- and scooter-sharing,⁴¹ and the dramatic growth in parcel deliveries driven by online shopping.⁴² These trends have all improved convenience, but except for bike-sharing, they have also harmed the urban environment by increasing traffic congestion, especially as delivery trucks and for-hire vehicles fight for curb space.⁴³

Quayside can test some solutions to these problems, including a mobility package that discounts some shared rides each month, streets designed for self-driving vehicles, and an underground freight delivery system. But a citywide transportation challenge cannot be solved on four blocks alone.

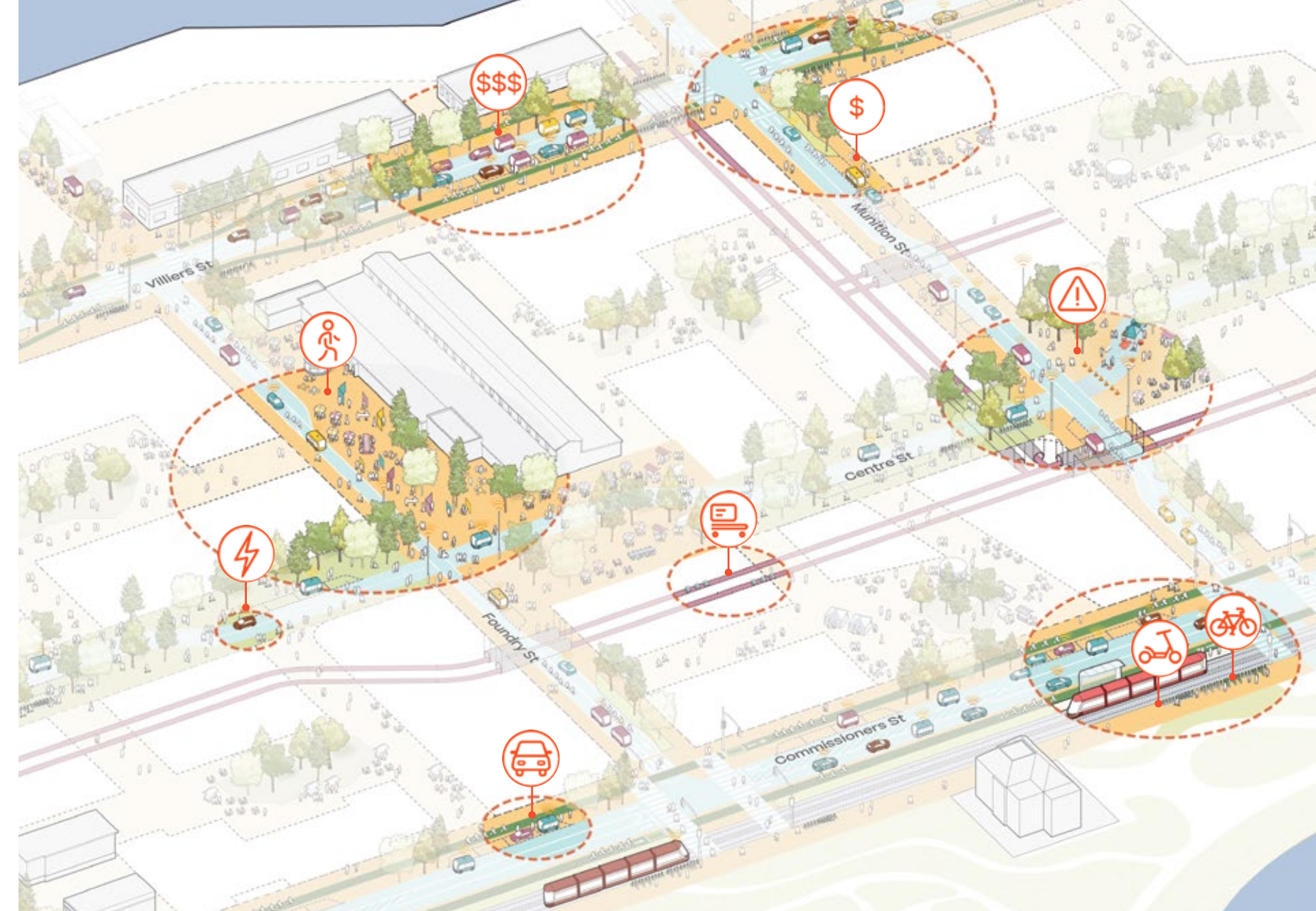
Applying the successful solutions across an entire transportation network can maintain the convenience offered by these new innovations while reducing traffic congestion and its related problems.

The River District has the potential to become a model for 21st-century urban mobility.

Discounted mobility packages.

Sidewalk Labs is committed to providing people with a full set of transportation options designed to meet all of their needs without owning a car. These options include expanding public transit, creating more walkable neighbourhoods and more extensive cycling networks, and increasing the availability of ride-share and ride-hail options.

But it can be hard for people to evaluate all of their choices — and the costs of various options — in real time. That is why Sidewalk Labs is proposing digital tools that can help residents and workers understand the real price of each transportation option, encouraging the choice of public transit via discounts and credits. A monthly mobility subscription that



Map

New mobility systems on Villiers Island



Dynamic curbs provide drop-off and pick-up availability, with pricing based on congestion levels.



Streets restricted to self-driving vehicles reduce vehicle lanes and maximize pedestrian space.



Electric self-driving vehicles create quieter streets and less pollution.



On Boulevards, dynamic curbs provide drop-off and pick-up space for both self-driving and traditional vehicles.



Self-driving delivery dolleys operate in below-grade tunnels, reducing truck traffic on streets.



Dynamic streets can adjust space allocations based on real-time traffic conditions, with self-driving vehicles easily routed around street closures.



Multi-modal transportation options, such as bikes and scooters, are located adjacent to light rail stations.

integrates these real-time options could cover a discounted Toronto Transit Commission pass, an unlimited Bike Share Toronto membership, access to e-scooters and other low-speed vehicles, and credits for rides with ride-hail or car-share providers.

At the scale of Quayside, the combination of these strategies can achieve very low rates of auto ownership among residents, but the overall impact would be limited. It would not significantly shape visitor behaviour or create a low-traffic environment, due to the proximity of major roads such as Lake Shore Boulevard.

At the scale of the River District, however, the number of residents and employees would be large enough to achieve volume discounts for transit and new mobility services, creating a self-sustaining base of users.

Supporting and incentivizing electric vehicles would create streets within the River District that are quieter and less polluted.

All autonomous.

Sidewalk Labs believes that self-driving vehicles will likely become ready for widespread use as ride-hail services just as the first neighbourhoods in the River District are completed.

Sidewalk Labs has developed a proactive plan to harness the potential of self-driving vehicles to create safer streets that prioritize pedestrians, cyclists, and public transit, positioning the River District to pioneer a transportation network for the 21st century. Once self-driving vehicles are widespread, it will be possible to imagine entire neighbourhoods in which traditional cars travel only on Boulevards, with the rest of the streets reserved for self-driving vehicle use.

Sidewalk Labs seeks to maximize the mobility benefits of ride-hailing through staging areas, pick-up and drop-off zones, and shared-ride pricing. These initiatives aim to ensure that self-driving technology achieves the goals of expanding access to the city without a car, reducing household costs, and recapturing parking space for more vital public uses.

Self-supporting freight.

To reduce the impact of delivery trucks clogging city streets, Sidewalk Labs has designed a pioneering system that would consolidate most packages at a central location and deliver them through self-driving delivery dollies travelling through secure underground tunnels that connect directly into building basements.

This system would be a zero-emissions solution that would maintain or exceed convenience to customers.

It is not financially feasible to build and operate this system if the delivery zone is limited to a neighbourhood the size of Quayside. Sidewalk Labs anticipates that, together, Quayside and the River District would attract enough packages to make the construction of this system affordable and deliver savings to companies no longer responsible for delivering every package to its final destination.

All-electric.

In Quayside, Sidewalk Labs envisions several efforts to encourage the use of electric vehicles, consistent with Toronto's mobility objectives. But Quayside's noise and air-quality profile would be shaped more by Lake Shore Boulevard and the Gardiner Expressway than by the vehicles owned and operated within the neighbourhood.

At the River District scale, these strategies can begin to reshape the urban experience, as the majority of vehicle trips would be conducted by people who live and work in the neighbourhood. A variety of strategies — including discounts, priority lanes, or pricing — could be used to incentivize the transition. As a result, the streets of the River District could be far quieter and less polluted, offering a vision for a clean urban future.

Limited parking.

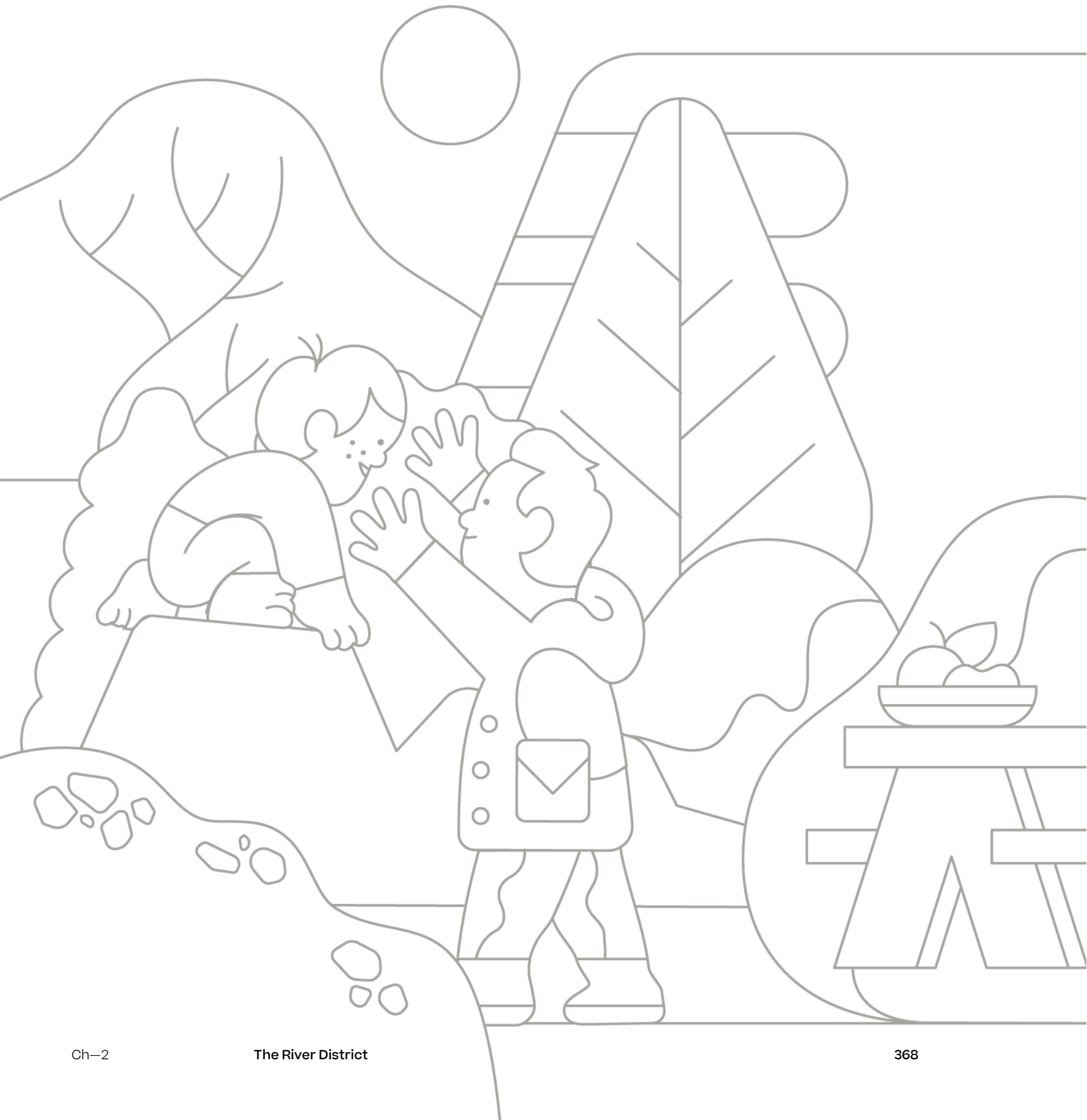
Similar to the strategy initiated in Quayside, the parking approach in the River District would eliminate fixed on-street parking spots in favour of dynamic pick-up and drop-off curb spaces. A reduced number of hourly parking spots would be offered in garages on site, with additional long-term spots offered at off-site facilities nearby. Spots within the neighbourhood would favour electric-powered car-share services.

Coordinating the network.

In Quayside, the proposed Waterfront Transportation Management Association (WTMA) — a new public entity tasked with coordinating the entire mobility network — can manage traffic congestion at the curb by using real-time space allocation and pricing to encourage people to choose alternative modes at busy times.

At the scale of the River District, however, active traffic management could yield far greater benefits, as the WTMA could not only optimize the available road and curb space but also apply pricing to encourage shared rides during congested periods. Active management would rely on a real-time understanding of the curbs, roads, weather, special events, and other factors, as well as the infrastructure tools to allocate lanes and signal times to achieve traffic objectives.

Public Realm



Creating an expanded, varied, and active public realm network

Expanding the public realm innovations initiated in Quayside across the River District would have a catalytic effect that goes beyond simply adding more parks. It would spark a wider variety of experiences, uses, and possibilities as part of a vast interconnected network.

Sidewalk Labs can build on the extraordinary foundation established by the renaturalization of the Don River⁴⁴ and outlined in the Port Lands Planning Framework by adding even more public spaces, supporting greater adaptability, improving all-season use, and creating new connections between streets, parks, plazas, and waterways.

Creative ways to expand public space.

Sidewalk Labs can build on its mobility strategies to generate significant new public space.



See the “Public Realm” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Public Realm” section.

Limiting vehicle lanes for cars would lead to expanded, landscaped sidewalks, some of which could become large enough to accommodate public installations such as pop-up markets, performances, and lush plazas. Dramatically reducing the number of space-intensive private garages would enable buildings to shrink their footprints,

creating space for a connected network of interior courtyards as well as winding pedestrian pathways that still maintain sight lines to ensure public safety.

These additional public connections can transform the public realm into its own kind of mobility network, offering a more intimate way to travel through a neighbourhood, which can strengthen community engagement, lead to healthier lifestyles, and spark unexpected connections.

In Quayside, these innovations can create 15 percent more open space than would be created by existing precinct plans.⁴⁵ But given that the neighbourhood is only four blocks long, the amount of extra space is modest in real terms.

When a similar approach is applied across an area the size of the River District, however, it would result in a significant increase in Toronto’s overall open space network, building on Waterfront Toronto’s vision to make public space the anchor for new communities.

Creating a greater variety of open spaces.

In its Quayside plan, Sidewalk Labs has sought ways to maximize the diversity of uses possible within a small space by breaking down the boundaries between indoors and outdoors, land and water, and green and hardscape. It has also explored ways to create adaptable spaces that can be repurposed for multiple uses — for example, enabling a range of sports to take place on the same field through the use of embedded lighting and other strategies.

Applied at the scale of the River District, this flexible, boundary-breaking approach can lead to an area unlike any other in Toronto, where it is possible to walk to nearly any point in 15 minutes and encounter a range of public experiences on the way — from kayaking along a river into the open harbour, to listening to a concert or playing mahjong on a series of floating barges, to rock climbing on old industrial infrastructure.

The River District’s innovation guidelines could ensure that public spaces are designed with the ability to adapt easily, so that as new cultural and recreational concepts emerge, the spaces can respond to meet the community’s needs.

Weather mitigation strategies to expand outdoor hours.

In a cold-weather climate like Toronto, wind, ice, and snow can make it challenging to be outside for much of the year. But the River District’s existing precinct plans highlight the need to create a public realm that can remain vibrant and accessible year-round.

To that end, Sidewalk Labs has explored a range of weather mitigation strategies that it would begin implementing in Quayside, including heated pavement that can melt ice and snow and canopies or building “Raincoats” that can extend over the street and connect to the sidewalk, creating airy, insulated pockets during inclement weather. Altogether, these strategies can increase the amount of time it is comfortable to be outdoors in Quayside’s public spaces by 35 percent.⁴⁶

But the most powerful tool to improve comfort is modifying the orientation of a street grid and the shape of buildings to reduce wind. Quayside’s small size and existing streets make it hard to deploy these techniques to their greatest potential.

Across the River District, these weather-mitigation approaches can have immense impact. Sidewalk Labs projects that if these strategies are implemented as part of the innovation guidelines, they could double the number of comfortable hours outside for key spaces, compared to a typical Toronto development.

Applying these innovations at the scale of the River District also makes them more affordable. Cost is particularly significant when it comes to materials like ETFE (Ethylene Tetrafluoroethylene), a durable, highly transparent, lightweight plastic film that is used for the building Raincoat and is ideal for creating comfortable indoor-outdoor environments.⁴⁷

In 2019, Sidewalk Labs designed and constructed a prototype; based on this work, Sidewalk Labs estimates that maturing the Raincoat technology and installing Raincoats at multiple locations within Quayside would lead to a 71 percent cost reduction per installation (relative to the prototype). There should be an even greater drop in expenses per square foot at the scale of the River District. This scale also affords a great opportunity to explore diverse architectural expressions.

An interconnected network that becomes a regional resource.

The River District would be developed within the context of an extraordinary new public realm network created by the flood-protection plan work currently underway.

That plan will create a new 30-hectare nature preserve that functions like a central park for the entire River District, providing access to a network of trails, expansive fields, waterways, hills, and wetlands. This green spine will extend through the Don River Valley itself, establishing pedestrian and cycling paths that run alongside the river for miles up the ravine, connecting to Don River Valley Park and other destinations.

The building Raincoat, which protects sidewalks from the elements, is part of a weather-mitigation system that could help double the number of comfortable outdoor hours in key spaces of the River District.



Sidewalk Labs believes that any public realm plan for the River District must take advantage of this exceptional resource and build on the principles it establishes for blurring the lines between water, wilderness, and land, integrating nature into urban life and using the public realm to strengthen connections across the city.

Such principles form the foundation of Sidewalk Labs’ public realm proposal for Quayside, but its contribution to the citywide network would be modest. At the scale of the River District, however, substantial new connections are possible — to the park and beyond.

The River District can extend the animation initiated at Parliament Slip through the Keating Channel, creating a vibrant series of land-water spaces brought to life by floating cafés, bars, and performance venues.

The River District could include unique public spaces such as the Keating Channel, featuring a canal with creative programming along both aides and pedestrian bridges linking neighbourhoods across the water.



Sidewalk Labs proposes a new pedestrian bridge over the Don River as it meets the inner harbour, connecting Villiers Island to Polson Quay through a continuous water-front walkway. This bridge would position the Polson Quay promenade to become a citywide attraction, making its spectacular views of Lake Ontario and downtown Toronto accessible to more people.

Within Villiers-Keating, Sidewalk Labs believes that multiple new pedestrian bridges across the Keating Channel could create a water-based beating heart of the neighbourhood, similar to great canal cities like Amsterdam or Venice.

An expanded ground-floor network would create new economic, creative, and programming possibilities

Across the River District, the stoa model can be claimed and interpreted by each neighbourhood to reflect its distinct needs and opportunities, reshaping the flexible ground floors to support everything from urban manufacturing to experimental retail to art, culture, and community spaces.

As described in greater detail in the “Quayside Plan” chapter in Volume 1, as well as in the “Public Realm” chapter of Volume 2, stoa is a flexible lower-floor space, frequently spanning two storeys, that can be adapted to serve a wide variety of neighbourhood and citywide needs.

In Quayside, stoa could help test new approaches to retail and experiment with integrating production, cultural, and community spaces into neighbourhoods. But with limited space, it would be impossible to do more than touch on the possibilities offered by this new model.

At the larger scale of the River District, there is an opportunity to implement a wider range of uses and to tailor the uses of each stoa space to support the unique and often changing needs of each neighbourhood.

While each community would feature a mix of retail, commercial, and social infrastructure spaces, some neighbourhoods could focus on workshop and production space while others might emphasize arts and cultural space. The size of the district would provide the critical mass of space to explore a wide variety of uses, reflecting the distinct character of each neighbourhood.

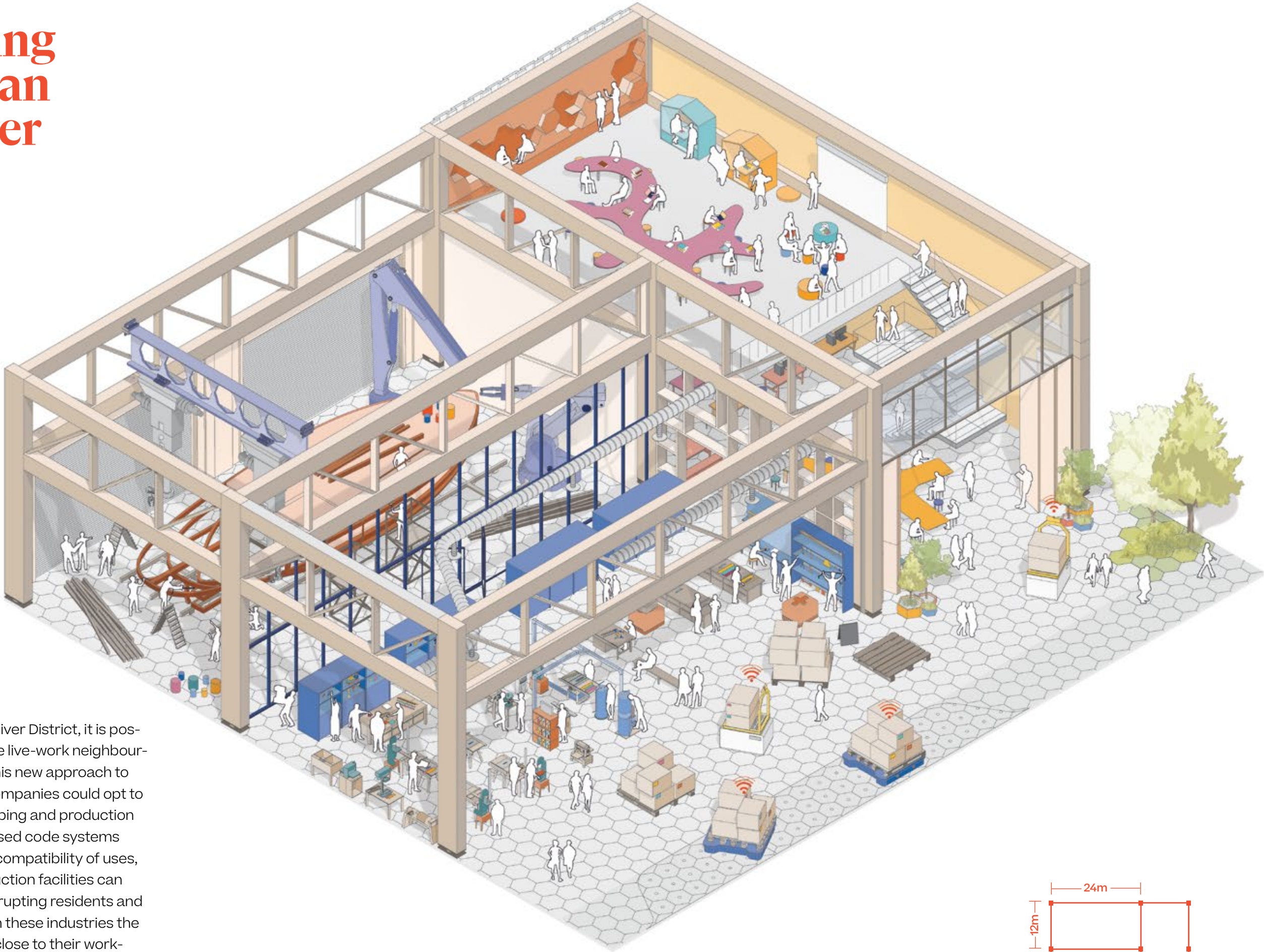
In Quayside, Sidewalk Labs proposes to take on the role of vertical developer (with local partners) and ground-floor property manager to demonstrate the viability of this new approach to lower-floor spaces. At the scale of the River District, the goal would be to have the private market adopt the stoa model — including flexible space and infrastructure, digital leasing and operations, and a highly diverse mix of uses — to serve community needs, provide jobs, and help create lively neighbourhoods.

Case study: Supporting the growth of an urban manufacturing cluster

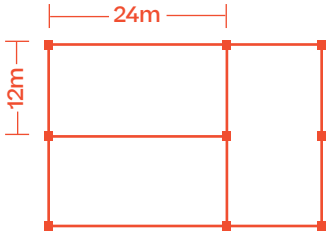
Manufacturing is once again resurgent in urban areas.⁴⁸ Businesses are finding success through new models, including prototyping products, producing and selling them on-site, and scaling their businesses in urban environments. Next-generation manufacturing is already growing in Toronto, which is part of why the City of Toronto has launched an initiative to create a Light Manufacturing Incubator for local startups.⁴⁹

In Quayside, stoa space would accommodate light manufacturing and shared fabrication equipment, creating opportunities for crossover between production and other industries — be it retail, art, culture, or food and beverage. But the site's small size and the need for diverse neighbourhood programming limit the amount of space that can be dedicated to exploring these connections and fostering this industry.

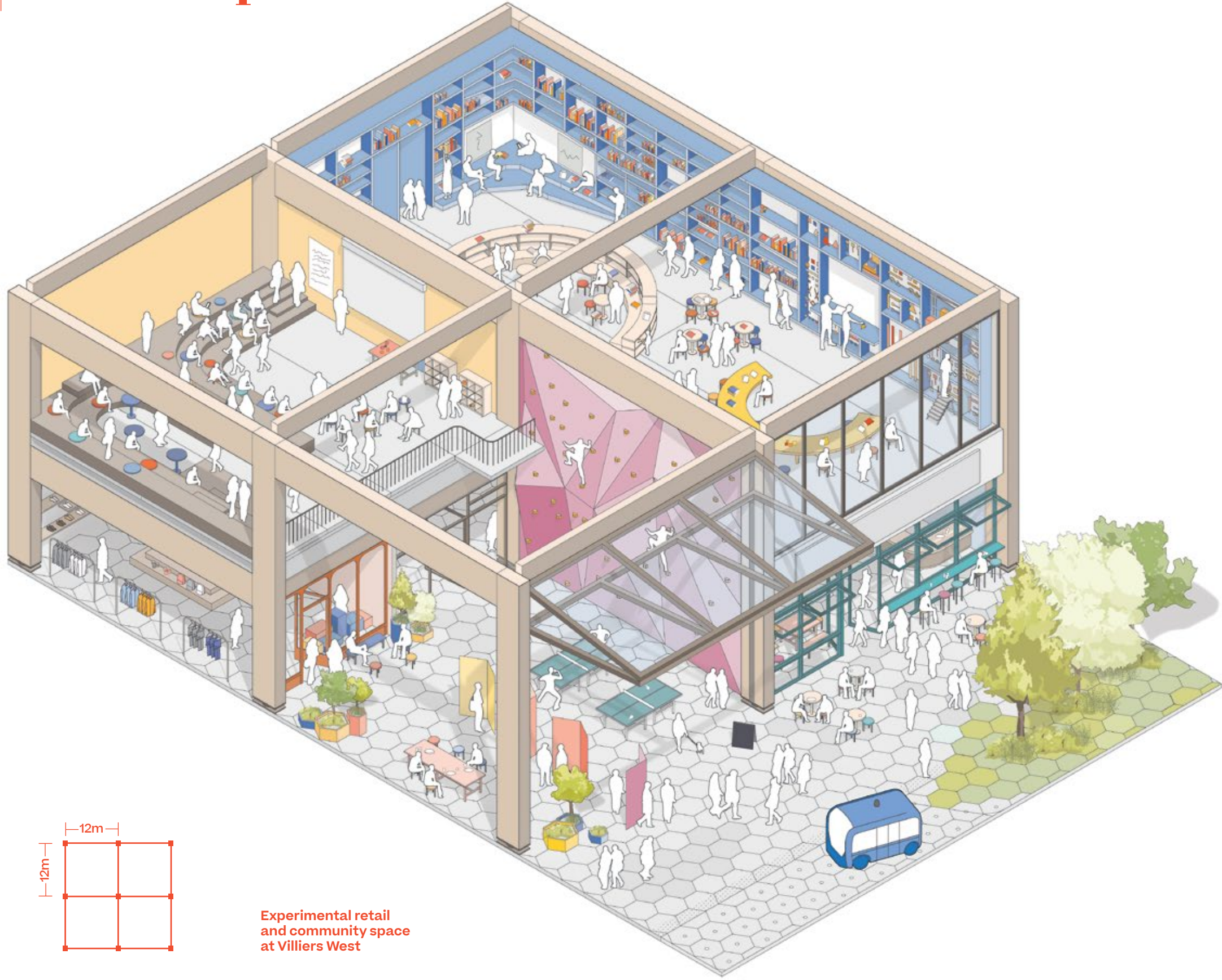
At the scale of the River District, it is possible to create whole live-work neighbourhoods defined by this new approach to the ground floor. Companies could opt to locate their prototyping and production there. Outcome-based code systems could facilitate the compatibility of uses, ensuring that production facilities can operate without disrupting residents and affording workers in these industries the opportunity to live close to their workplaces. The result can be a major catalyst for new jobs in Toronto that are complementary to the urban innovation hub at Villiers West and the Film District to the east.



Urban manufacturing at Polson Quay



Case study: Experimental retail integrated with community and cultural space



The Quayside plan aims to explore new models for retail, cultural, and community spaces within a neighbourhood, but Villiers West offers an opportunity to expand the most successful innovations to support the creation of a regional destination.

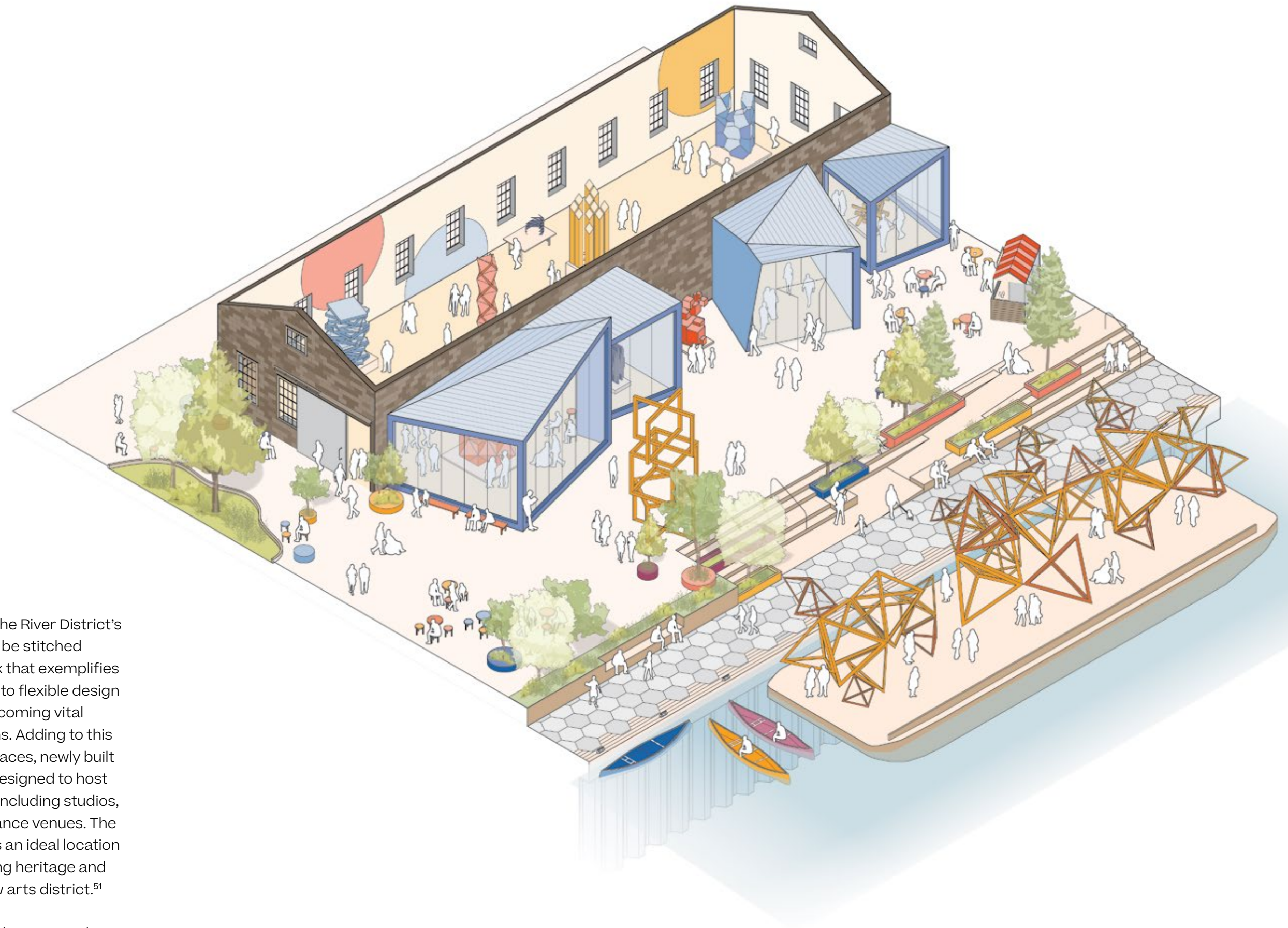
The innovation campus at Villiers West would be anchored by the Google Canadian headquarters and Urban Innovation Institute, drawing a working and visiting population interested in novel ideas and experiences. The adjacent Promontory Park is being developed by Waterfront Toronto as a resource for all Torontonians, with a particular focus on families and children. The proximity of these uses would provide a unique opportunity for the stoa space to showcase its range and adaptability.

The 290,000 square feet of lower-floor spaces in this area are an ideal setting to focus on retail innovation, where emerging businesses and leading brands can test new ideas. These efforts could range from computer vision-enabled payment systems to better integration of online and offline retail experiences. One example of an area that is ripe for innovation is food services. A place like the River District — animated at all hours with the Google campus, Urban Innovation Institute, and nearby parks — would provide a place to try new solutions, such as delivery robots, new food concepts, and urban agriculture.

Beyond enabling retail innovation, stoa's flexible approach creates unique opportunities to integrate community and cultural facilities instead of isolating them in stand-alone structures. Bringing these different experiences together can provide value — such as new foot traffic — to retail spaces and can improve community services by enabling complementary uses like clinics and pharmacies to be located close together.

At Villiers West, stoa can provide space for public programs to serve the population visiting the park, such as an environmental education centre or a museum. With the continuous, varied stream of visitors, the adaptability of stoa can help spaces evolve to serve different purposes from day to night, weekday to weekend, and season to season.

Case study: Arts production



Arts and production at
heritage buildings at
Keating Channel

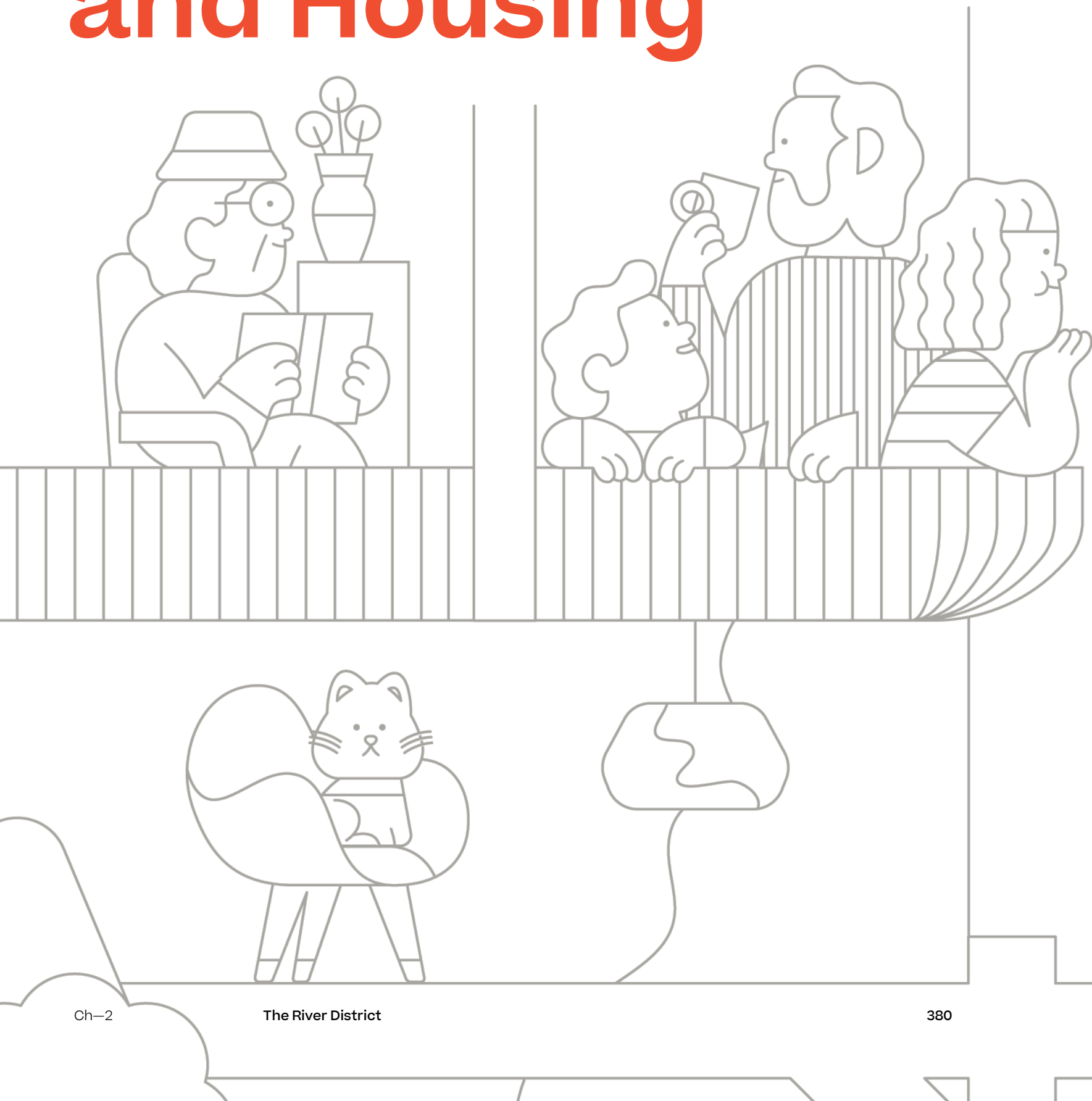
Around the world, revitalized port areas have been energized by the reclamation of historic buildings, which mix the past, present, and future in stunning and powerful ways. Artists have frequently led these projects. For NDSM in Amsterdam, a group of artists and skaters defined, designed, and led the reclamation of a former industrial shipyard.⁵⁰

Unlike Quayside, the River District contains a range of heritage industrial structures that are ideal sites for this kind of reclamation. New leasing and equity models could ensure long-term opportunities for creative production. Some of the sites, such as the Dominion Box Boards building in Polson Quay, already have a vibrant community of artists working there and ready to lead.

Historic spaces within the River District's neighbourhoods could be stitched together into a network that exemplifies innovative approaches to flexible design and adaptive reuse, becoming vital community destinations. Adding to this inventory of existing spaces, newly built stoa spaces could be designed to host cultural and arts uses, including studios, galleries, and performance venues. The Keating Channel area is an ideal location for this approach, mixing heritage and new structures in a new arts district.⁵¹

The River District could become a clear destination for millions of Toronto's visitors further cementing the city's global identity as a world-class leader in cultural production.

Buildings and Housing



Catalyzing a new mass timber industry and construction supply chain

Catalyzing the growth of a sustainable mass timber buildings industry and a new factory for modular construction would create 2,500 jobs, accelerate construction timelines by up to 35 percent, and reduce overall construction costs.

Mass timber, a sustainable building material made from compressing multiple pieces of timber, is increasingly popular as a construction material, with at least 21 timber towers above seven storeys in construction or completed within the past five years.⁵² As strong as steel and twice as strong as concrete by weight, mass timber is also easier to manufacture, faster to assemble, and dramatically more sustainable than traditional construction materials. A single building can be the environmental equivalent of taking hundreds of cars off the road.⁵³

With nearly 40 percent of the world's sustainable forests, Canada is well-suited to capitalize on this emerging material.⁵⁴ But there are very few facilities in North America that can process the quantity of materials needed for even a single building, let alone a larger development. As a result, Canadian mass timber projects have frequently had to import

treated wood from Europe,⁵⁵ a lengthy and expensive process that negates some of the cost and sustainability gains the approach would otherwise afford.

To improve the local economy and catalyze a new industry around sustainable mass timber, Sidewalk Labs plans to support the launch of an Ontario-based factory.⁵⁶ This new supply chain would begin with local foresters and sawmills creating the baseline mass timber pieces, which would then be sent to the factory to be cut into assembly-ready building components, with local general contractors performing the on-site assembly.

This unique combination of emerging materials and a streamlined construction process could transform the industry — accelerating timelines, improving predictability, reducing costs, minimizing



See the “Buildings and Housing” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Buildings and Housing” section.

A new local factory
could accelerate
construction
projects by up to

35%

Factory-based construction of building parts would result in less waste, better working conditions, and streamlined regulatory approvals.

neighbourhood disruption from work sites, and yielding a healthier, more sustainable, and stunning built environment.

These benefits only become possible at the scale of the River District.

But these benefits only become possible with a development area that is large enough to support the creation of a new local mass timber industry, the investment required to build and operate a new factory, and the time and expense required to invent new digital tools that can facilitate design and permitting.

While Quayside's size — it consists of only 10 buildings — is too small to support a re-conception of the entire construction supply chain, the River District would provide the developable area to achieve the full power of this approach. Sidewalk Labs estimates that roughly 6 million square feet of development are needed to justify an investment in the factory-based production of mass timber, as well as for such a factory to hit peak efficiency in producing sustainable building components on a predictable timeline that developers can trust.



A new local factory that processes wood into mass timber components could accelerate construction projects by up to 35 percent, reduce construction costs below current market rates, and significantly improve predictability for developers.⁵⁷ Rather than crowding worksites with cranes, trucks, and staging for construction materials, this factory-based process would allow much of the work to take place off-site, resulting in less noise and traffic disrupting the neighbourhood and a smaller, safer construction site that completes its work more quickly.

By planning holistically for development that includes the River District, Sidewalk Labs could have a functioning factory operational by 2021, in time to support the development in Quayside and to achieve the construction speed benefits there.

Generating thousands of jobs and dramatically reducing greenhouse gases.

Unlocking the potential of Canada's forests as part of the River District development could generate about 2,500 new full-time jobs.⁵⁸ These impacts could grow beyond the waterfront, as more designers and developers tap into this new pipeline for an array of projects. They could be supported by additional local factories and foster a growing ecosystem of Canadian industries that contribute to the supply chain: fabricators, foresters, sawmills, loggers, and more.

Despite the scale of development, the impact on the forests would be negligible. Even if the entire River District were constructed out of mass timber, it would still represent less than 1 percent of the total amount of wood grown in Canada's certified forests each year, which could be replenished with just a few days of forest growth.

The environmental benefits of mass timber construction also increase significantly at scale. For example, the wood required to build the River District would sequester over 600,000 tonnes of carbon, the equivalent of taking more than 127,000 cars off the road per year.⁵⁹

A factory-based approach to mass timber construction could generate 2,500 person-years of full-time employment over a 20-year period.

Achieving new levels of housing affordability, choice, and inclusivity

Creating housing across the scale of the River District would unlock powerful private funding sources that could generate over \$1.4 billion and make significant progress towards the city’s affordability goals. With additional public-sector support, this private funding could help create more than 13,600 below-market units while providing new housing options that can accommodate a wide range of household needs.

No issue is more pressing in Toronto right now than housing affordability, but the tools that exist today to address this challenge are limited. Below-market units are increasingly expensive and difficult for the government to deliver, and housing options could better respond to the needs of residents.

Sidewalk Labs has identified a set of private funding sources that can help support an ambitious vision for below-market housing: the increased value of public land due to factory-built timber construction, a condo resale fee, and new value created by more efficient unit design (an approach called “affordability by design”). These efforts could be supported by

an expanded mix of housing options that create the foundation for a more diverse and inclusive community.

These ideas would be initiated in Quayside, but its small size means that their impact would be limited. At the scale of the River District, however, these approaches can offer a vision for the future of housing, with the potential to unlock over \$1.4 billion. With additional public-sector support, this private funding could help create more than 13,600 below-market units. That would include 6,800 affordable housing units, representing nearly a third of the current annual citywide target for new affordable rental housing units.

Three new private sources could direct a portion of the value generated by the innovations deployed across the River District to below-market housing. Sidewalk Labs proposes that these funds would be managed by a new entity known as the Waterfront Housing Trust. The trust would be operated by the public sector — not by Sidewalk Labs — and it would be responsible for assembling and disbursing funding to below-market housing in the River District.

1

Unlocking \$639 million in land value with factory construction.

Sidewalk Labs projects that its new modular factory approach would generate significant value for developers. The buildings could use the factory’s library of parts, which would have already been reviewed by city agencies and designed to fit together seamlessly, reducing the risk of delays and accelerating construction time by up to 35 percent.⁶⁰ These benefits would enable developers to complete more projects, at a lower cost, within a given time frame than they do today.

Developers who recognize this value should be willing to bid a higher price for the land, much of which is publicly owned. These higher land value payments to the government, realized on all publicly owned parcels across the scale of the River District, could generate an estimated \$639 million that could be directed towards affordable housing.

2

Generating \$321 million with a condo resale fee.

A permanent 1 percent resale fee could be applied on the resale of all condos in Quayside and the River District to support affordable housing. Assuming recent market trends for individual unit turnover, each condo could contribute an estimated total of \$23,000 towards below-market housing through 2050. Sidewalk Labs would agree that the fee could be implemented within its own development in Quayside to demonstrate that the impact on condo sales would be negligible and not affect pricing. But those relatively modest fees compound with scale, and over time they could generate an estimated \$321 million across the River District.

Generating \$1.4 billion in private funding to support a 40% below-market housing vision

	Quayside		Full proposed IDEA District	
Funding sources for 40% below-market program	Below-market program achieved*	\$M	Below-market program achieved*	\$M
Traditional public sources	20%	\$115	25%	\$2,492
Existing government programs**	13	77	10	997
Land value or other gov't contributions	7	38	15	1,495
New private sources	7%	\$37	15%	\$1,435
Affordability by design	7	37	5	475
Factory-driven land value	0	0	7	639
Condo resale fee***	0	0	3	321
Sidewalk Labs contribution	13%	\$77	-	-
Total sources	40%	\$229	40%	\$3,927

* These figures reflect the incremental impact of each source towards creating a below-market program, based on overall 40 percent below-market program cost of \$229 million.

** Existing government program figures are estimated for Quayside based on recent awards and the proposed below-market housing program. These figures assume programs are scaled up across the IDEA District on the same basis as in Quayside. As a result, totals may exceed annual budget allocations pending timeline of affordable units coming online between 2024 and 2048.

*** Analysis assumes 2.5 annual percent inflation rate.

Achieving new levels of housing affordability, choice, and inclusivity

3

Creating \$475 million in value through affordability by design.

Sidewalk Labs’ proposed efficient and ultra-efficient units, as well as co-living housing options, offer a new way of living for Toronto residents that goes beyond the typical downtown dwelling. While these apartments have a smaller footprint than traditional units, smarter design can ensure that they adapt better to meet the needs of increasingly diverse Torontonians, from seniors looking to age in place as part of an active community to families looking to put down roots on the eastern waterfront.

Expanded community spaces and a larger public realm can supplement efficient apartments, providing access to more experiences, resources, and support. For example, rather than having a rarely used dining room large enough to host the occasional special event, residents could access a communal kitchen and dining room stocked with a range of equipment that would require vast amounts of space to store in a personal kitchen (and spend most of the year untouched). Additional features designed to provide adaptability over time could include walls that are easy to move, allowing families to grow or shrink their units as needs change.

The ability to design efficient units that are comfortable and attractive can also contribute to affordability. Reducing the unit’s footprint allows developers to build more total units. Sidewalk Labs proposes that a percentage of this increased revenue potential be directed towards affordable housing.

At the scale of the River District, this approach to “affordability by design” can create \$475 million in value that could be applied towards below-market housing.

Over 34,000 new residential units would offer unprecedented variety.

The promising models initiated in Quay-side for increased rentals, co-living options, and new pathways to ownership like “shared equity” — which enables residents to own part of their home and rent the rest — can only impact a small fraction of Toronto’s households. While a substantial percentage of units would be below-market housing, the neighbourhood’s total unit count would limit the number of non-profit partners that can realistically participate.

The River District has the scale to demonstrate the true potential of new housing options and to engage a range of developers, including traditional developers, non-profit organizations, and innovative

These new housing options can attract and keep a diversity of residents on the waterfront, helping to create the foundation of a thriving and inclusive urban community.

Achieving new levels of housing affordability, choice, and inclusivity

companies rethinking housing models. Once the most successful ideas are expanded across the scale of the district, they can begin to broaden housing options for people across the city.

For Toronto families who face the tough choice between long commutes and family-friendly living, the River District can help to establish city living as an option

for a lifetime. And for families finding traditional home ownership out of reach, the River District can establish renting or shared equity as viable options.

These new housing options can attract and keep a diversity of residents on the waterfront, helping to create the foundation of a thriving and inclusive urban community.

Potential number of housing units at the full proposed IDEA District

At the full proposed scale of the IDEA District — including Quayside and the River District neighbourhoods, as well as the optional participation of Keating West — the housing vision could deliver 34,000 units. That supply includes 13,600 below-market units, supported by new private funding sources as well as additional government support.

	Quayside		IDEA District	
Funding sources for 40% below-market program	%	# units	%	# units
Total market housing	60%	1,560	60%	20,400
Total below-market housing	40%	1,040	40%	13,600
Affordable (<100% AMR)	20	520	20	6,800
Below-Market (100–150% AMR)	20	520	20	6,800
Total	100%	2,600	100%	34,000

Sustainability



Achieving climate positivity requires bold solutions only possible at scale

Eliminating greenhouse gas emissions requires entirely new approaches to designing and operating infrastructure and energy management systems. That kind of dramatic reinvention can only be effective and financially feasible when applied across a broad area and supported by strong cooperation between the public and private sectors.

Waterfront Toronto has established the objective of creating a climate-positive community on the eastern waterfront, meaning that the Sidewalk Toronto project must do more than eliminate greenhouse gas emissions within the district — it must actually contribute to lowering the city’s overall emissions.

Toronto and Ontario have taken tremendous strides towards lowering their greenhouse gas emissions, eliminating coal-fired generation in Ontario⁶¹ and embracing policies like TransformTO that support the expansion of electrification, improve building energy efficiency, and nearly eliminate landfill waste.⁶² But studies show that most new construction could end up using as much energy as existing buildings.⁶³

Achieving the urgent goal of climate positivity requires a dramatic reinvention of how major infrastructure systems are built and operated; the way energy is generated, transported, and consumed; and the partnership model between the public and private sectors.

Sidewalk Labs has proposed a range of new energy solutions to address this challenge, beginning in Quayside, where its initiatives would result in an 85 per cent reduction of greenhouse gases.⁶⁴ But these initiatives proposed are not economically feasible to deploy in Quayside unless they are part of a comprehensive approach that spans a large enough geographic area to support inventing, implementing, and operating this entirely new ecosystem of sustainable infrastructure.



See the “Sustainability” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Sustainability” section.



Map Proposed energy infrastructure in the River District

The River District’s advanced energy infrastructure would capture a variety of clean energy sources to provide heating, cooling, and domestic hot water.

- IDEA District
- Neighbourhood plant
- Mini plant
- Thermal grid
- ▨ Geoexchange fields
- ▨ Solar and battery storage in all buildings

- Proposed Enwave connection
Waste heat recovery
- Commercial data centre
Waste heat recovery
- Cherry Street Sewage
Pump Station
Waste heat recovery
- Expansion of possible
industrial tenants
Waste heat recovery

- Ashbridges Bay Wastewater
Treatment Plant
Waste heat recovery
- Anaerobic digestion facility
Biogas creation
- Local power plant
Waste heat recovery

Sidewalk Labs believes the River District is large enough to generate a customer base capable of sustaining the capital costs of major new infrastructure and the expense of designing, building, and installing digital technologies to manage these new systems.

Specifically, to keep Quayside resident energy bills in line with Toronto averages, the advanced power and thermal grids would require a \$19 million supplemental innovation investment based on the current plan, due to factors including the high cost of geothermal exchange and initial electric grid connections, in addition to the poor economies of scale for operating costs. While this is not financially sustainable at the scale of each neighbourhood, no additional supplemental innovation investment would be required to extend operations into the River District beyond Villiers West, because the systems scale in a financially sustainable way.

There are three areas where scale is particularly essential to achieving a climate-positive community: mobility, electricity, and energy data.

1
Creating a more sustainable mobility system.
Increasing transportation options.
 Expanding mobility options across the eastern waterfront — including extending public transit, enhancing walking and cycling networks, and using policy tools to encourage shared trips — would create convenient, affordable mobility alternatives to the private car, leading to dramatic greenhouse gas emission reductions across the River District.
Using scale to reach an all-electric mobility system. While Quayside is too small to reshape mobility patterns, the River District provides an opportunity for transformative change. Policy tools, from pricing incentives to widespread electric charging across the district’s extensive street network, could accelerate the use of electric vehicles.

2

Making full electrification affordable.

Buildings are responsible for 60 percent of Toronto’s greenhouse gas emissions,⁶⁵ with the overwhelming majority of those emissions (87 percent) generated by the burning of on-site natural gas for heating and hot water production.⁶⁶

Ensuring that all heating in new construction is electric, rather than relying on natural gas, is critical to making a serious dent in greenhouse gas emissions. But electricity prices can be significantly higher than natural gas prices due to the high cost of electricity generation, transmission, and distribution infrastructure. Without radical reductions in energy demand, electrifying neighbourhoods has the potential not only to increase the cost of heating and hot water for local customers, but also to increase electricity rates citywide, as the costs for enlarged electrical infrastructure gets spread across all ratepayers.

Sidewalk Labs has developed a comprehensive set of strategies to make full electrification affordable, but these efforts rely on a business model that requires implementation over a broad geographic area. They include:

Reducing energy demand. Energy-efficient building designs can drive down the amount of energy needed to heat and cool buildings, without sacrificing comfort, through improved building insulation, airtight construction, and other techniques inspired by the Passive House movement. These approaches can be paired with digital energy “Scheduler” tools designed to optimize energy use. At the River District, these savings could be 17 percent.

Designing an advanced power grid. Sidewalk Labs proposes to collaborate with Toronto Hydro and technology providers to design an advanced power grid that would integrate energy management strategies and clean energy sources, such as solar power and battery storage, to reduce the need to draw from the main grid at peak times, when the grid is frequently forced to draw on fossil fuel-based sources to meet demand. The grid would include pricing and rely on the aforementioned Scheduler tools to help shift energy use away from peak times.

Developing a thermal grid. Sidewalk Labs proposes implement a thermal grid with electric heat pumps to provide cooling, heating, and domestic hot water to buildings. The thermal grid is designed to exchange thermal energy between buildings and to draw from a variety of clean energy sources, such as wastewater heat, deep lake cooling, and industrial waste heat. Existing buildings in the River District would have the option either to continue to use natural gas or to use the thermal grid.

At the scale of the River District, electrification becomes affordable as a result of the cumulative benefits of smarter energy management; new and increased sources of clean energy; economies of scale in infrastructure development and maintenance; and a larger customer base across which to spread the costs of setting up and administering a business, including the new metering and billing platforms for the advanced power grid and thermal grid.

3

Realizing energy targets with the help of building data.

Studies show that a building’s actual energy use in operation can be far greater than what is shown by a model submitted for energy code compliance. This disconnect is known as the “performance gap.” In its study of nearly 100 buildings in Toronto, Sidewalk Labs found the performance gap to be 13 percent, meaning buildings use more energy when actually up and running than when modelled prior to construction.⁶⁷

Sidewalk Labs has developed two approaches to not only help close the performance gap but enables cities to establish real-time operational energy targets (instead of design-based, pre-construction targets).

Deploying real-time metering. Real-time metering of all energy systems (such as heating, cooling, lighting, and equipment) would enable comparisons between actual energy performance and design-based projections, creating a feedback loop for architects, engineers, and developers to help close the performance gap and improve the energy efficiency of buildings.

Tying energy outcomes to energy codes. In Quayside, Sidewalk Labs proposes to deploy an energy auditing tool called “Perform” that would incorporate factors such as occupancy, tenant type, and weather to create dynamic targets for energy use intensity. At the scale of the River District, Sidewalk Labs would plan to work with the city to use this type of tool to develop operational energy targets based on real-time metering for new buildings — not on pre-construction designs.

Because Quayside’s development program consists of only 10 buildings, the neighbourhood would create a limited amount of data points to develop actionable insights related to energy use.

But the River District’s greater scale of diversely programmed buildings could help to accumulate a critical mass of building data, leading to powerful insights that can inform building design and enable new approaches to energy use regulation.

Getting over the finish line to climate positivity

With all of Sidewalk Lab’s sustainability and mobility initiatives in place, there would still be a small amount of greenhouse gas emissions that the district would be responsible for: roughly 0.72 tonnes per capita per year, which is an 89 percent reduction from today’s Toronto average.⁶⁸

River District sustainability
By the numbers:
→ 89% reduction in annual per capita GHG from Toronto average
→ 11,000 annual tonnes of CO2 offset by anaerobic digestion
→ 70,444 annual tonnes exported by thermal grid

This amount is due to several factors that are outside of the district’s control, including the fact that Ontario’s power grid is very clean but not completely fossil-free,⁶⁹ and that insufficient space exists to generate and store all of the electricity needed to avoid using the main power grid when natural gas-fired power generators are being used. If changes in technology allow, the first priority would be to further reduce on-site emissions.

While the River District would approach carbon neutrality, climate positivity is evaluated by a project’s impact on the city’s overall greenhouse gas emissions. By definition, this means that a district must find ways to export clean energy beyond the project area or actively reduce Toronto’s current greenhouse gas emissions.

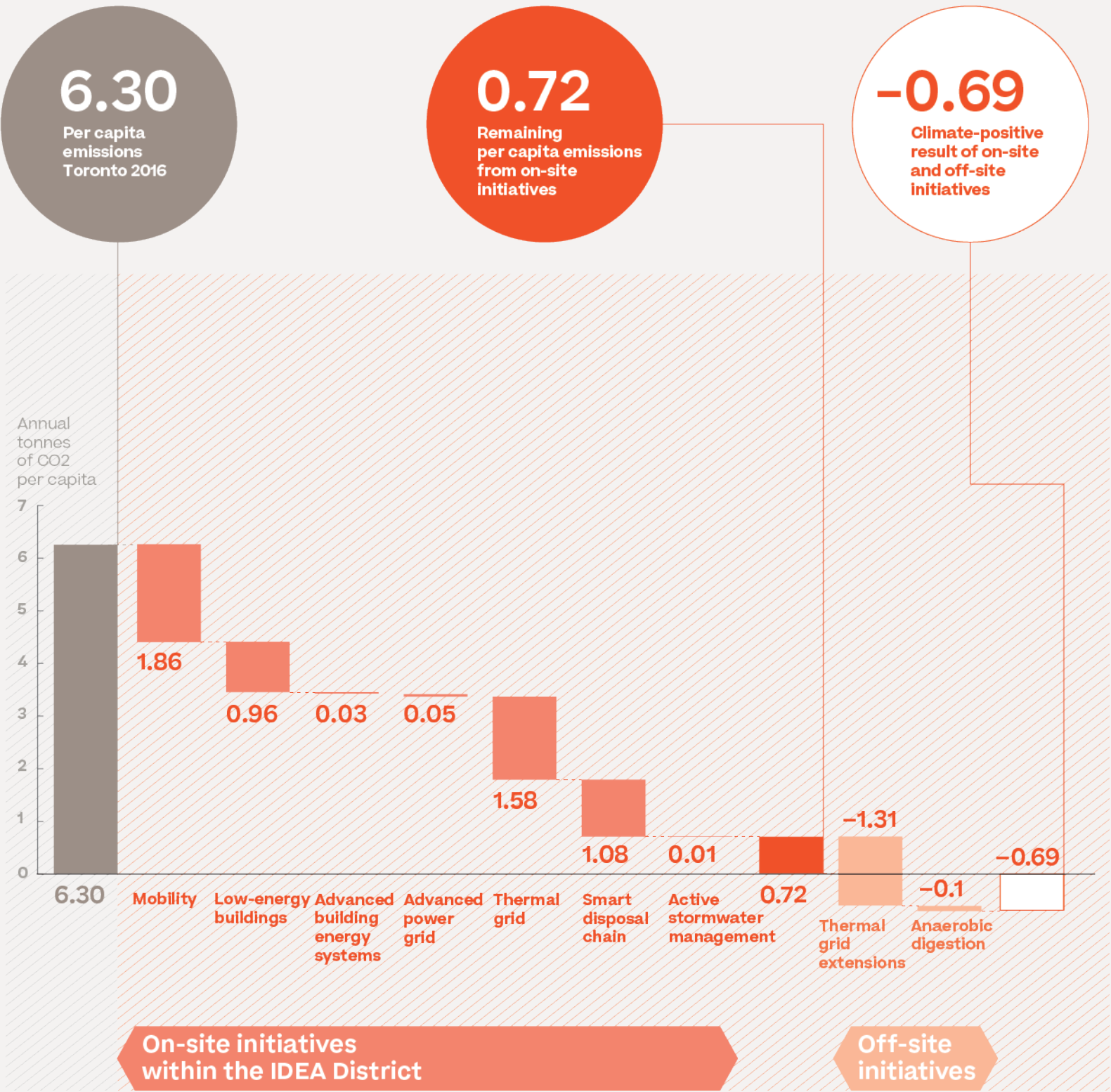
Sidewalk Labs has identified two clear opportunities to achieve climate positivity: a potential generator of biogas and a major source of waste heat.

Building an anaerobic waste digestion facility.

The River District would generate an estimated 45,150 tonnes of source-separated organic waste annually — enough to make it economically feasible to partner with a local operator to build an anaerobic digestion facility to process organic material and turn it into biogas. A facility serving the River District would produce nearly 1.3 megawatts’ worth of biogas. This approach could achieve nearly 11,000 annual tonnes of CO2 offset, pushing the project into climate-positive territory.

The River District would contribute to lowering the city’s overall emissions, thereby becoming a climate-positive community.

The path to achieving a climate-positive district



Note: Because the estimated GHG reductions shown here are based on a combination of design, technology, and behaviour change, Sidewalk Labs expects unforeseen shortfalls at the neighbourhood scale of Quayside.

The sustainability systems proposed in this plan include self-correction and learning mechanisms (such as advanced energy management tools and a smart disposal chain) that should reduce these variations as development proceeds across the IDEA District.

As a result, Sidewalk Labs has reduced the sustainability plan’s expected GHG outcomes 10 percent in Quayside and 5 percent at the full scale of the IDEA District.

The scale of the River District makes it a credible model for cities on the journey to radically reduce greenhouse gas emissions.

Tapping into the energy potential of Ashbridges.

The largest potential source of energy that the River District could tap to achieve climate positivity is the nearby Ashbridges Bay Wastewater Treatment Plant. Sidewalk Labs has calculated that the effluent from Ashbridges could provide 150 to 200 megawatts of thermal energy potential, creating a surplus of clean energy in the project area that could enable the project to export 70,444 annual tonnes of CO₂.

Sidewalk Labs would seek permission to partner with the city's Toronto Water division to extend the proposed thermal grid infrastructure to tap into the waste heat generated at Ashbridges, with a commitment not to impact the plant's operations.

Priority outcome spotlight

Achieving the largest climate-positive district in North America

The River District would become the biggest, densest climate-positive district in North America and the third largest in the world, after announced projects in Jaipur, India,⁷⁰ and Seoul, South Korea.⁷¹

Waterfront Toronto has already set the goals for this in motion with its Lower Don Lands application to the C40 Climate Positive Development Program.⁷² The River District expands the scope of this project into additional adjoining neighbourhoods, and the MIDP aims to chart the path for the practical implementation of these goals.

The scale of the River District makes it a credible model for cities on the journey to radically reduce greenhouse gas emissions. Its size means that it cannot cherry-pick businesses and building activities to artificially lower emissions. Instead, this development must attract and support business and light industry of all kinds, including those with high energy demands.

Further, since the River District would consist of predominantly new construction served by a very clean Ontario power grid, it lacks the easy wins that other projects can claim, like shuttering a coal-fired district heating plant. Instead, its strategy must focus on challenges that all cities face: the transformation of mobility systems and the affordable electrification of heating, hot water, and light industry.

An opportunity to use waste as a resource

At scale, waste can be used as a resource rather than going straight to a landfill. Waste from the River District would be recovered, recycled, and used to create products or energy — a cycle known as the “circular economy.”

At the River District, Sidewalk Labs would seek to match its target in Quay-side to divert 80 percent of waste from landfill, exceeding the city’s goal of diverting 70 percent and dramatically surpassing the current diversion rates from Toronto’s average multifamily and commercial buildings, which range from 13 to 27 percent.⁷³

But the sheer volume of waste generated at a scale like the River District presents new opportunities to rethink the entire waste stream and pioneer new business models to ensure the waste does not ... go to waste.

Sidewalk Labs estimates that 240,000 tonnes of waste could be generated annually across the River District, of which 192,000 tonnes (80 percent) would be diverted. This waste can be repurposed in local facilities, creating circular economies.

In this virtuous cycle, recycled materials would be sorted and sold to specialized recycling centres that process the material and sell it back to manufacturers for use in new products. Organic waste like food could be processed at a new anaerobic digestion facility and exported as fuel to heat buildings outside of the River District.

Building a new facility to convert recycled materials into new products.

The scale of the River District would make the construction of a local materials recovery facility (MRF) financially feasible, and Sidewalk Labs would look to partner with a third party to create such a facility.

Recycling can be complicated, and people frequently make mistakes, contaminating the recycling stream. MRFs separate commingled recycling streams into individual materials, such as glass, plastic, and metal, and try to remove that

contamination. This “clean” and sorted recycling can then be sold to facilities and scrap yards to be repurposed.

MRFs can receive higher prices for cleaner materials. If the incoming stream of recyclables to the MRF is highly contaminated with non-recyclable material, it becomes impossible to fully clean it, leading to more expensive processing costs at the MRF and lower market value for the materials.

To improve the cleanliness of the recycling and organic waste streams that leave the community, Sidewalk Labs has developed a digital strategy to provide real-time feedback to residents and tenants on how to improve their recycling — efforts that could yield one of Toronto’s cleanest waste streams. But Quayside is

too small to support its own MRF, meaning that its recycling would still need to go to a shared facility, where the materials from surrounding communities would be combined and processed together, making it virtually impossible for Quay-side to secure the cost benefits of its superior recycling.

By contrast, Sidewalk Labs projects that the River District would generate 118,000 tonnes of glass, metal, and plastic recyclables, nearly 25,000 tonnes of cardboard, and 42,000 tonnes of paper annually. That is enough material to support a dedicated MRF that would enable the waterfront to reap the full economic benefit of its clean recycling streams.

Those revenues could be significant: cleaner waste streams could reduce MRF processing costs by as much as 28 percent while increasing the value of its recyclables by more than \$10 million annually. The new facility’s proximity to the district would also reduce the environmental and financial cost of transporting materials to a MRF that is farther away.

Sidewalk Labs estimates that 240,000 tonnes of waste could be generated annually across the River District, of which 192,000 tonnes (80 percent) would be diverted.

Cleaner waste streams could increase the value of recyclables by more than **\$10 million** annually.

An expanded public realm could minimize the need for grey stormwater infrastructure

Dramatically expanding the public realm across the River District would bolster the potential for green infrastructure to improve stormwater treatment and reduce flood risk. The new plantings could significantly reduce the need for grey infrastructure, generating significant savings and freeing up space for more public uses.

Sidewalk Labs proposes to use green infrastructure to manage the flow of stormwater. This approach provides environmental benefits, an enhanced public realm, and reduces the need for expensive treatment and storage infrastructure, generating cost savings to the city and to private developers.

When expanded across the scale of the River District, the implementation of green infrastructure as a natural flood-mitigation strategy can begin to provide significant cost savings, including reducing or even eliminating the need for water quality treatment facilities that would typically be required for new development, in addition to the environmental and public realm benefits. This approach would include improved bio-retention,

with hundreds of thousands of cubic metres of soil and plantings distributed across the district to absorb water on the ground. Blue and green roofs, with the ability to detain and store water before it reaches the ground, would be installed on most buildings.


Despite these strategies, some “hard” stormwater infrastructure, such as cisterns, would be required, but their size and cost would be minimized by the introduction of digital tools to manage flows more efficiently. Together, these systems would prevent over 90 percent of the average annual rainfall from entering the stormwater collection facilities.⁷⁴



See the “IDEA District” chapter of Volume 3 for more details on the proposed Open Space Alliance.

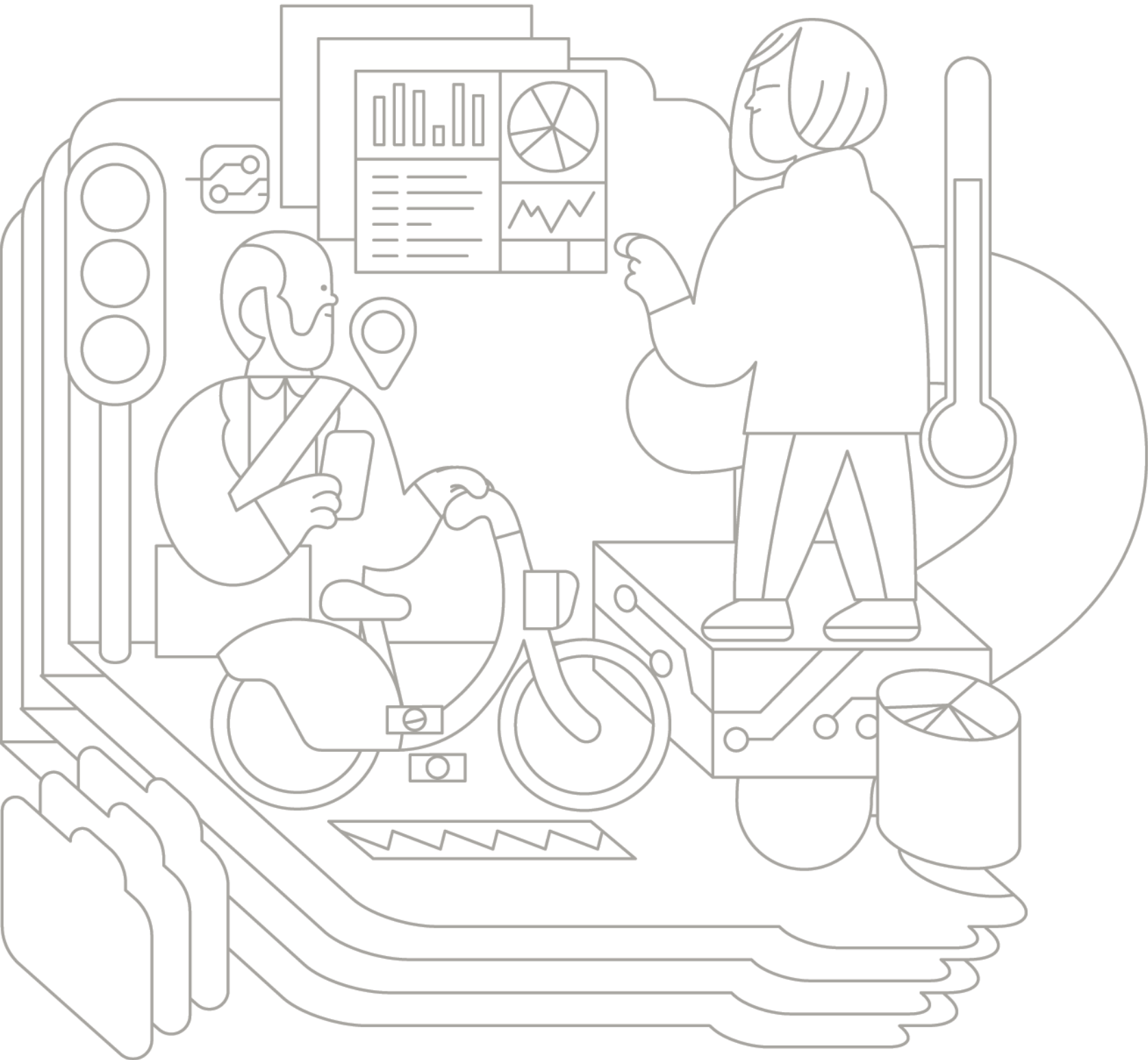
These approaches could be implemented as alternative ways to meet water quality standards that would reduce or potentially eliminate the need for the large treatment facilities, which are expensive to build and use significant amounts of energy to operate.

To avoid burdening Toronto Water with ongoing maintenance of green stormwater management infrastructure in the public realm, Sidewalk Labs proposes that the management of these engineered natural systems be taken on by the Open Space Alliance, a proposed new non-profit entity that would manage the River District’s public realm.

Today, developers pay to build and maintain water management infrastructure within their sites. Under this new approach, developers would give the Open Space Alliance an upfront green infrastructure fee that would cost less than the on-site facilities that would otherwise have been required. They would also provide a monthly maintenance fee to the alliance that would be the equivalent of what they would have spent maintaining those facilities. 

Advanced stormwater systems would prevent over 90 percent of the average annual rainfall from entering the stormwater collection facilities.

Digital Innovation



Catalyzing the growth of an urban innovation cluster

The River District would foster the creation of a digital innovation cluster and attract innovators from around the world by providing more affordable and flexible digital infrastructure, setting data standards that are open and secure, creating a trusted process for responsible data use, and launching a baseline set of digital services for third parties to build on.

Flexible, affordable digital infrastructure becomes viable at scale.

Digital infrastructure is a basic building block of the future city — creating connectivity that helps residents, companies, organizations, and local agencies use data to launch new services that improve urban life. It is also the catalyst for new services or businesses no one has thought of yet and the cornerstone of a digital economy. Sidewalk Labs proposes deployment of two primary types of digital infrastructure: ubiquitous connectivity and standardized mounts.

This advanced network only becomes financially sustainable at the scale of the River District, given the number of residents or businesses needed to recoup the initial investment in core enabling infrastructure. Deployed at a larger scale, this connectivity would enable residents to use their own private network everywhere — from their couch to a park bench — and enable businesses to explore new ideas.

Mounts. To significantly reduce the cost and installation time of launching new digital innovations, Sidewalk Labs has designed a new type of “Urban USB port” that would provide a physical mount, power, and connectivity to digital devices (such as Wi-Fi antennae, traffic counters, or air-quality sensors) fixed to street poles and traffic signals. Sidewalk Labs estimates that its mounts could reduce

Connectivity. Waterfront Toronto has worked to ensure that fast internet connectivity across the waterfront is not a luxury for the few — but, rather, the new standard. Building on this progress, new advances in fibre-optic technology and network security could offer residents and businesses access to secure, super-fast internet connections at an affordable cost.



See the “Digital Innovation” chapter of Volume 2 for more details on the proposed innovations and initiatives described in this “Scaling Innovation: Digital Innovation” section.

Standardized mounts could reduce device installation time by

92%

the time of the fixed-mount hardware installation by roughly 92 percent — down from 30 hours today to two hours.⁷⁵

The proposed mount requires significant geographic distribution to gain the widespread adoption needed for device manufacturers (such as Wi-Fi antenna producers) to incorporate the standard into their own designs, just as existing USB ports needed to prove their worth before laptop and phone manufacturers made them standard features. The River District would provide the necessary scale for development and adoption of the standardized mount.

Core digital services can help catalyze an ecosystem.

A true ecosystem of urban innovation requires a catalyst that makes it possible for third parties to build new digital applications, services, products, or tools that improve people's lives.

To serve as that catalyst, Sidewalk Labs proposes to launch a limited set of digital services — including the mobility management, energy management, and outdoor comfort systems described in earlier parts of this chapter — that are currently not being pursued by the market but are essential to achieving Waterfront Toronto's quality-of-life objectives in Quayside and the River District. These proposed services (including their purpose, data collection sources, and some potential third-party applications) are listed in detail in the “Digital Innovation” chapter of Volume 2.

Beginning at the scale of the River District, the urban data that these services make accessible to others could enable countless new innovations to emerge from local companies, entrepreneurs, startups, researchers, agencies, civic groups, and others.

As explained more in the “Economic Development” chapter of Volume 1, Sidewalk Labs estimates that these conditions for digital innovation could lead to roughly 10,500 urban innovation sector jobs at the proposed scale of the River District. That might include anything from a next-generation bike-share service, to small business tools that help retailers launch a successful pop-up, to civic tools that help families find an affordable home, to improved building designs that reduce energy, to new apps that bring people together outdoors.

The list is bound only by imagination.

Ensuring open standards and responsible data use.

Digital infrastructure and services would enable the River District to generate a critical mass of urban data that could be used to develop new services, apps, and systems to help tackle urban challenges. But to ensure this information is easily usable by entrepreneurs, researchers, government agencies, and community members across Toronto, Canada, and the globe, it must be standardized, open, and publicly accessible.

Sidewalk Labs plans to achieve its goal of a digitally open city by publishing data in standard formats — enabling third parties to build on top of urban data in new and important ways. At the scale of the River District, a non-profit Urban Innovation Institute could promote these standards and provide a core hub for open data discussions and use.

Another core condition for digital innovation is instilling trust from the community that information collected in cities would preserve the privacy of individuals and be used for the greater good.

Beginning in Quayside, Sidewalk Labs proposes the creation of a publicly accountable independent entity called the Urban Data Trust. This entity would be tasked with establishing clear guidelines

for responsible data use as well as overseeing a process for reviewing and approving all proposals to collect or use urban data in the project area (including all proposals from Sidewalk Labs).

This responsible data use process would apply in addition to existing Canadian privacy laws, and the Urban Data Trust should coordinate with privacy regulators as necessary.

The Urban Data Trust should be launched in Quayside, where it could begin to work through use cases. Over the longer term, once the entity has benefited from many use cases in Quayside and certain parts of the River District, Sidewalk Labs expects that the Urban Data Trust could have broader coverage.

An independent Urban Data Trust would oversee a process for reviewing and approving all proposals to collect or use urban data in the River District.

The Future Can Start Now

Toronto does not have to wait decades to take advantage of the eastern waterfront. Sidewalk Labs proposes a series of **activation strategies** that can begin reconnecting Torontonians to this area and introducing the **possibilities of its future**.



The opening of 307 on June 16, 2018, featured pop-up Market 307 with Scadding Court Community Centre, as well as First Nations Dancers EJ Kwandibens, Sagatay, and Nicole Leveck. Credit: Sidewalk Labs

While the long-term transformation of the eastern waterfront will take decades, the Port Lands Planning Framework recognizes that it is important to begin animating these sites with experiences that reflect the overall mission and values of the future neighbourhoods.

This approach is grounded in the principles of creative placemaking — an evolving field of practice that leverages the power of the arts, culture, and creativity to drive a broader agenda for change, growth, and transformation in ways that also build character and quality of place.

One of the biggest challenges for new developments is that time is often the most powerful tool for creating diverse communities. This factor is why many new developments may initially feel sterile or uninviting. It takes time for people to accrue experiences, create a history, and share memories. The strength of a new community is also much greater when people have been involved from its initial conception through development.

That is why Sidewalk Labs created 307, a public workshop and creative platform for the local community, located in Quayside. Since the launch of 307 in mid-2018, more than 11,000 Torontonians have visited the space to participate in workshops, provide feedback on ideas, propose solutions to urban challenges, see new prototypes, or engage with emerging local artists.

Over the coming years, Sidewalk Labs would like to build on this experience, working with Waterfront Toronto, the City of Toronto, and local businesses and organizations to develop programs that inspire people to experience the Port Lands in new ways or even for the very first time. It would do this work in collaboration with the local landowners.

Key sites for early activation might include temporary floating installations in Parliament Slip and the Keating Channel; a pop-up park at Polson Quay; and underutilized heritage structures throughout the area.

Potential early activations

Sugar Beach
A potential stop on a summer ferry route



Yonge Slip
A downtown departure point for summer pop-up ferry service

Parliament Slip
A ferry stop and floating barge with community and cultural events



307
Ongoing prototypes (such as this building Raincoat), public art, and programming at 307, the Sidewalk Labs innovation workspace on Quayside



Polson Quay
A pop-up park and connection to artist studios



Keating Channel
A floating barge with performances and art installations connected to heritage buildings



Cherry Beach
Refurbished bike lanes through the Port Lands to reach Cherry Beach and the outer harbour



Public art installations and festivals can draw people to the eastern waterfront and provide new, delightful perspectives on the area

The waterfront has the potential to become an epicentre for Toronto's arts community. Public art is already interwoven into new developments like the West Don Lands; Icebreakers, a series of public art installations, is celebrated annually along Queens Quay; and Max Dean, one of the city's most acclaimed artists, has an extraordinary studio in a heritage building on Polson Quay filled with kinetic and interactive sculpture.

This growing cultural energy led to the creation of a new waterfront Toronto Biennial of Art that will launch in the fall of 2019. The event will take place every two years, offering accessible and transformative visual art exhibitions, installations, talks, learning opportunities, and happenings in new and unexpected spaces along the shores of Lake Ontario.

Sidewalk Labs has sought to contribute to this momentum, partnering with local arts groups to support projects that let people experience the lake in new ways. In summer 2018, Art Spin created the Kajama Boat Tour, which repurposed a historic tall ship as a performance vessel

that traveled around the harbour, staging site-specific performances at locations from the Turning Basin to the Eastern Gap.

In winter 2019, projection mapping artist Kavi created an interactive installation on the proposed prototype for a building Raincoat that is designed to protect Torontonians during inclement weather.

For future projects, Sidewalk Labs envisions integrating an Indigenous perspectives. Towards this end, Sidewalk Labs and Waterfront Toronto worked with the Brook Mollroy Indigenous Design Studio to bring together Indigenous artists and designers to discuss Indigenous design principles and how state-of-the-art technology might intersect with the richness of Indigenous design.

Potential upcoming projects include design competitions for Indigenous artists to interpret how to create indoor-outdoor structures that can draw people outside year-round, as well as workshops with local schools and community members to create augmented-reality apps that bring to life the long history and stories of the land.

Toronto singer-songwriter Bruno Capinan performs during the Art Spin Kajama Boat Tour in August 2018. Credit: Priam Thomas for Art Spin, 2018



An interactive installation by Toronto artist Kavi takes place on a building Raincoat designed by Toronto architecture firm PARTISANS, in March 2019. Credit: David Pike



Temporary creative projects can make the eastern waterfront more accessible, for more people, right away

The Port Lands is currently only accessible through public transit by bus 72, which runs every 15 minutes from Union Station and follows a route along Commissioners Street. Seasonally, bus 172B runs to Cherry Beach. This limited service means that most of the time, the south Port Lands — including Cherry Beach, Cherry Beach Recreation Fields, Tommy Thompson Park, and the Marinas — are not accessible by public transport.

Sidewalk Labs is prepared to fund, design, and operate a summer pop-up ferry service that could be piloted with Ports Toronto from Yonge Slip or Parliament Slip to other parts of the Port Lands, making it accessible and fun for people from across Toronto to visit the area. The ferries could be exclusively electric watercraft.

There is currently a separated bike path through Cherry Beach that is part of the Martin Goodman Trail. But the connection into the city and to the central waterfront is along Cherry Street and is not well-marked, making it dangerous and uninviting for cyclists to travel alongside heavy trucks.

In partnership with the city, Sidewalk Labs is prepared to fund a project to refurbish these lanes, which could include painting the existing bike lane along Cherry Street in a heavy colour. That would make Toronto's growing cycling community feel invited to this area and start establishing the future connection between the park and the city.

Over the coming years, Sidewalk Labs would like to work with the city to develop programs that inspire people to experience the Port Lands in new ways.

Endnotes

General note: Unless otherwise noted, all calculations that refer to the full River District scale are inclusive of the IDEA District's entire proposed geography, including Quayside and all currently privately held parcels (such as Keating West). Unless otherwise noted, all currency figures are in Canadian dollars.

Charts note: Sources for the charts and figures in this chapter can be found in the accompanying copy for a given section; otherwise, the numbers reflect a Sidewalk Labs internal analysis. Additional information can be found in the MIDP Technical Appendix documents, available at www.sidewalktoronto.ca/midp-appendix.

1. See Christopher McKinnon, "Exploring the History of Toronto's Big Waterfront Dreams." On the Waterfront (blog.waterfronttoronto.ca), August 27, 2014.

2. Government of Canada, Province of Ontario, City of Toronto and Waterfront Toronto, Backgrounder: Port Lands Flood Protection. November 2018.

3. See City of Toronto and Waterfront Toronto, Port Lands Planning Framework. September 2017; also Urban Strategies Inc., City of Toronto and Waterfront Toronto, Villiers Island Precinct Plan. September 2017.

4. Waterfront Toronto, Realizing the Waterfront's Potential: Approach to Evaluating the Master Innovation and Development Plan. December 8, 2018.

5. For more details on the proposed Urban Innovation Institute, consult the "Economic Development" chapter of Volume 1.

6. See the "Buildings and Housing" chapter of Volume 2 for more information on the development of a mass timber industry and its potential to accelerate construction timelines.

7. See the "Sustainability" chapter of Volume 2 for more information on each of these elements of sustainable urban infrastructure.

8. For more information about this proposal's affordable housing programs and targets, consult the "Buildings and Housing" chapter in Volume 2 as well as the "Development Appendix" in the MIDP Technical Appendix.

9. See Volume 3 for more details about the proposed housing trust.

10. For more details about LRT costs, see City of Toronto, Waterfront Network Transit Plan. Report to Executive Committee, January 10 2018. See also Ben Spurr, "Delaying Waterfront LRT would cost billions in lost tax revenue, productivity: BIA report." Toronto Star, January 30, 2019.

11. See Martin Buck, Crossrail project: finance, funding and value capture for London's Elizabeth line. London: ICE Publishing, 2017; also City of Calgary, Rivers District Community Revitalization Plan. April 2007.

12. The rationale and assumptions that inform each of the impacts listed here are explained in further detail in their corresponding chapters of the MIDP (Economic Development, Sustainability, Buildings and Housing, Mobility, and Digital Innovation), as well as in the background materials provided in the accompanying MIDP Technical Appendix.

13. Gene Desfor and Jennifer Laidley, Reshaping Toronto's Waterfront. University of Toronto Press, 2011.

14. Port Lands Planning Framework. 2, 42.

15. Toronto Waterfront Revitalization Corporation, Waterfront Corporation Officially Launches International Design Competition for Lower Don Lands. News release, February 2, 2007.

16. Backgrounder: Port Lands Flood Protection. November 2018.

17. For city targets, consult City of Toronto, Open Door Affordable Housing Program Guidelines. January 2018. For residential projections in the River District, consult the "Development Appendix" in the MIDP Technical Appendix.

18. See the "Economic Development" chapter of Volume 1 for additional details on Alphabet's commitment.

19. To estimate the potential impact of Google's relocation to Toronto's waterfront, Sidewalk Labs, in partnership with the consulting practice of real estate services firm JLL, conducted case-study research on the impact of Google's prior relocations in five other cities around the world: New York, Chicago, Austin, Los Angeles, and London. Each of these cities has between 1,000 and 10,000 Google employees, a range commensurate with the proposed campus.

20. James Bourne, "Smart cities market value to hit \$2 trillion by 2025, says Frost & Sullivan." IoT News, April 4, 2018.

21. University of Toronto, Urban Innovation Report. July, 2018.

22. For more information about projected tax revenues from the eastern waterfront, consult the urbanMetrics report "Sidewalk Toronto Economic Impact Analysis" in the MIDP Technical Appendix.

23. See the "Buildings and Housing" chapter of Volume 2 for a more in-depth description of the Loft typology.

24. For more information on each of these systems, consult the "Sustainability" chapter of Volume 2.

25. For more information on generative design, consult the "Public Realm" chapter of Volume 2.

26. Jennifer Bonnell and Marcel Fortin, "Points of Interest: Keating Channel." In Don Valley Historical Mapping Project. University of Toronto: maps.library.utoronto.ca/dvhmp/index.html, 2009.

27. City of Toronto, East Harbour SmartTrack Station. smarttrack.to/smarttrack/new-stations/east-harbour-unilever-station/ (accessed March 18, 2019); City of Toronto, TTC and Metrolinx, Relief Line South Background. reliefline.ca/south/the-project/background (accessed March 28, 2019); Government of Ontario, Protecting What Matters Most: 2019 Ontario Budget (see "Chapter 1, Section B: Putting People First"). Queen's Printer for Ontario, April 2019.

28. See section 4.12 of Waterfront Toronto's Port Lands Planning Framework for more information about the Dominion Box Boards and its tenants.

29. The environmental assessment for the area's transit was launched in 2006 and approved in 2010. See MRC, East Bayfront Transit Class Environmental Assessment: Environmental Study Report. Prepared for the City of Toronto, the Toronto Transit Commission and Waterfront Toronto, March 2010.

30. Murtaza Haider and Liam Donaldson, IMFG Papers on Municipal Finance and Governance: Can Tax Increment Financing Support Transportation Infrastructure Investment? Institute on Municipal Finance and Governance – Munk School of Global Affairs, University of Toronto. November 29, 2016.

31. Citizens Budget Commission, Tax Increment Financing: A Primer. December 5, 2017.

32. Hatch, Economic Impact Study: Acceleration of the Implementation of Toronto Waterfront East LRT. Report prepared for the Waterfront Business Improvement Area, January 2019.

33. Consult the MIDP Technical Appendix - Mobility "Enabling Rapid Transit" section for details on the LRT extension as well as for ridership projections. For the city's proposed East Bayfront LRT route and stops, see Port Lands + South of Eastern Transportation + Servicing Master Plan Environmental Assessment. City of Toronto, September 2017. 380.

34. Canvas, The surprising costs of car ownership. August 28, 2018.

35. U.S. Department of Transportation, Federal Transit Administration, Public Transportation's Role in Responding to Climate Change. Updated January 2010.

36. Mira Shenker, "It's the First Snow of the Year!" On the Waterfront (blog. waterfronttoronto.ca), December 29, 2015.

37. "Sharing is Caring: What are Shared Streets?" Milhaus, January 7, 2016.

38. Alex Bowden, "More shoppers, more shops: TfL stats show benefits of designing streets around cyclists and pedestrians." Road.cc, November 16, 2018.

39. For more information about street types, see the "Mobility" chapter of Volume 2 and the Mobility "Streets for People" section of the MIDP Technical Appendix.

40. Consult the "Mobility" chapter of Volume 2 and the Mobility "Active Transportation" section of the MIDP Technical Appendix for more information cycling infrastructure and accessibility.

41. CB Insights, Disrupting The Car: How Shared Cars, Bikes, & Scooters Are Reshaping Transportation And Cannibalizing Car Ownership. Research brief, September 5, 2018.

42. Allan Rutter, David Bierling Dahye Lee, Curtis Morgan, and Jeff Warner, How Will E-commerce Growth Impact Our Transportation Network?: Final Report. Texas A&M Transportation Institute, August 2017.

43. Rutter et al., How Will E-commerce Growth, 17.

44. See Waterfront Toronto, Don Mouth Naturalization and Port Lands Flood Protection. 2019.

45. See the "Public Realm" chapter in Volume 2 for additional details on creating more open space through street designs and planning tools.

46. Please refer to the "Public Realm" chapter in Volume 2 and the Public Realm "Outdoor Comfort Development Standard" section of the MIDP Technical Appendix for more information about weather mitigation.

47. "ETFE–PV–Based Cells Provide a Lightweight, Flexible, Efficient and Possibly Disruptive Solar–Cell Alternative." Engineering360, June 12, 2018.

48. Rich Weissman, "Manufacturing returns to US cities, but with a new focus." Supply Chain Dive, June 22, 2017. See also Patrick Sisson, "How 4 cities are using manufacturing to build equitable economies." Curbed, September 29, 2016.

49. StartUP HERE Toronto, City of Toronto Launches RFP for Manufacturing Incubator. June 18, 2018.

50. Agile City, NDSM: Self–Made City. 2019.

51. Waterfront Toronto, Keating Channel Precinct Plan. May 2010.

52. Think Wood, Looking Up: Tall Wood Buildings Around the World. Infographic, November 2018.

53. Naturally Wood, Brock Commons Time Lapse. 2019.

54. Forest Certification in Canada. Natural Resources Canada, modified July 26, 2017.

55. Diane Peters, "Timber! Why an age-old building material is making a 21st-century comeback in Ontario." TVO, January 21, 2019.

56. Refer to the "Buildings and Housing" chapter of Volume 2 for more information on the development of a mass timber industry in Canada.

57. Refer to the "Buildings and Housing" chapter of Volume 2 for more information on the benefits of the proposed development of a mass timber industry in Ontario.

58. Figures based on analysis and report by urbanMetrics available in the "Sidewalk Toronto Economic Impact Analysis" section of the MIDP Technical Appendix. Refer also to the "Economic Development" chapter of Volume 1 for more information about job creation through a mass timber industry.

59. For more information about Canada's forests and the timber required to build the River District, as well as its carbon benefits, refer to the "Buildings and Housing" chapter of Volume 2. See also the Canadian Wood Council's online Carbon Calculator at cwc.ca/design-tools/carbon-calculator/ (accessed April 12, 2019).

60. For more information on construction timelines, refer to the "Buildings and Housing" chapter of Volume 2.

61. Ministry of Energy, Northern Development and Mines, The End of Coal. Government of Ontario, July 1, 2018.

62. City of Toronto, TransformTO. 2019.

63. City of Toronto, Zero Emissions Buildings Framework. March 2017. See also EQ Building Performance and Urban Equation, Toronto Multi-Unit Residential Buildings Study: Energy Use and the Performance Gap. Report for Sidewalk Labs, January 2019.

64. For more information on GHG reductions, refer to the "Sustainability" chapter of Volume 2 and the Sustainability section of the MIDP Technical Appendix.

65. City Planning Division, Zero Emissions Buildings Framework. City of Toronto, March 2017.

66. Toronto Atmospheric Fund, Keeping Track: 2015 Carbon Emissions in the Greater Toronto and Hamilton Area. 2018.

67. EQ Building Performance and Urban Equation, Toronto Multi-Unit Residential Buildings Study.

68. For more information on GHG reductions, refer to the "Sustainability" chapter of Volume 2 and the Sustainability "Sidewalk Toronto Energy Modelling" section of the MIDP Technical Appendix.

69. 2017 Community Energy and Greenhouse Gas Emissions Inventory. City of London, Ontario, August 2018.

Endnotes

- 70. C40 Cities Climate Leadership Group, Mahindra World City Jaipur becomes world's largest project to receive C40 Climate Positive Development Stage 2 Certification. National Geographic, June 4, 2015.
- 71. The Future City: Magok Urban Development Project. http://www.i-sh.co.kr/e_mgk/index.do (accessed April 2, 2019). See also "Spotlight on the C40 Climate Positive Development Program." C40 Cities C40 Blog, July 17, 2013.
- 72. Waterfront Toronto, Toronto's lower don lands selected for newly launched climate positive development program. May 20, 2009.
- 73. For more information about waste management and diversion rates, refer to the "Sustainability" chapter in Volume 2 and the "Master Plan - Basis of Design Engineering Report" in the MIDP Technical Appendix.
- 74. For more on stormwater management and diversion, refer to the "Sustainability" chapter in Volume 2.
- 75. For more information on connectivity and fixed-mount hardware, refer to refer to the "Digital Innovation" chapter in Volume 2.

**The River District
has the potential to
become a globally
recognized centre
where urban
innovations emerge,
grow, and flourish.**