City-Building, Intensification and COVID-19

Urban Project Roundtables
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THE URBAN PROJECT | LE PROJET URBAIN

CONTENTS

About the Urban Project

The Urban Project is a national platform convened by the Federation of Canadian Municipalities (FCM) for city leadership to meet and strengthen relationships with government, civil society, and the private sector to address pressing urban challenges and identify common solutions.

Launched in 2018, the Urban Project examines urban issues through the lens of cross-cutting themes of city finance, governance, intergovernmental relations, and municipal autonomy. The events bring together decision makers to actively co-create solutions to urgent urban problems at a pan-Canadian level.

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Methodology

This framing report brings together perspectives from a collection of academics and practitioners, exploring three critical discussion themes at the heart of city-building in the time of COVID-19 – and the long-term implications for inclusive and resilient cities.

About the Authors

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The Delphi Group provides strategic consulting services and innovative solutions to corporations and public sector organizations. As recognized leaders in climate change, corporate sustainability, cleantech, and the green and circular economy, they bring a unique combination of policy expertise, strategic planning, and technical knowledge to each project.

1   INTRODUCTION

The coronavirus pandemic is a globally devastating public health crisis. In Canada, the first incidence of COVID-19 was confirmed on January 25, 2020. By March 2020, Canadian cities along with many cities around the world went into various states of lockdown in an effort to reduce the spread of the virus. Given the speed and nature of the virus' spread, public health experts continue to advise people to avoid the 3 C's: crowded places, close contact, and confined spaces. But what about the 4th C: Cities? Cities are, by their very design and nature, places that thrive on human interaction and proximity.

Much like the spread of SARS, COVID-19 travelled across the world by airplane, arriving in one global city after the next. Indeed, cities, as the key nodes in a globally networked world, appeared to be vectors of the spread of coronavirus. Despite appearances though, researchers are confirming that the first wave of the pandemic was not disproportionately devastating for cities, relative to their overall population.

In Canada, cities have been and continue to be at the frontlines of the pandemic. The 22 municipalities that comprise the Big Cities Mayors Caucus represent nearly 60% of Canada's urban population and account for approximately 2 out of every 5 people living in Canada. Canada's largest cities have worked tirelessly to manage the pandemic and its impacts on public health, economic vibrancy and social well-being.

It is clear that cities face a heavy burden as a result of the pandemic: declining revenues from limited urban revenue sources including property taxes, program fees and public transit, the inability to run a deficit, and an uncertain future. As Canada moves beyond the first wave of the pandemic, concerns are emerging related to the connections between COVID-19 and the future of dense urban spaces, alongside questions about the prospects for our biggest cities to thrive.

1.1   COVID-19 and Density

Some of the earliest images of cities attempting to manage the spread of COVID-19 include eerie photographs of unoccupied downtown office towers, closed storefronts and empty streets. Given that COVID-19 spreads most effectively in closed, crowded spaces, office workers in particular have been both encouraged – and privileged - to work from home. By removing the need for people to travel to dense office districts, and the challenge of moving workers through elevator systems designed for high capacity use, what was previously some of the densest, most vibrant space in a city has been at least temporarily hollowed out. The repercussions for business and personal services that congregate around dense office zones is stark. The knock-on effects when knowledge workers shift to working from home for long periods of time are potentially devastating for co-located consumer-oriented businesses and their employees, property owners and real estate investors. In turn, questions abound regarding permanent shifts in urban form and land use that could result. The longer the pandemic lasts, the more likely it appears that the implications will be increasingly enduring.

These changes have led to debates about whether or not our cities are experiencing an urban exodus. Will Covid further precipitate the spread of urban populations into increasingly suburban areas? Are renters leaving because they are no longer tethered to the downtown core, or were they planning to move

regardless? Will downtown re-emerge as a desirable location for offices, office workers, and all the associated spillover business and personal activities that result from concentrations of people, once the public health risks associated with COVID-19 are reduced? What policies, planned or implemented now, will be capable of helping to direct our cities to a prosperous future?

1.2   Implications for the After Times

Like other pandemics, this pandemic will end. We do not know exactly when, whether it will be as a result of a vaccine, immunity, a slow petering out of the disease or something else. But once the threat of coronavirus subsides, how will our cities fare?

Urban responses that address the urgent challenges connected to coronavirus protection measures have been characterized by rapid change, creativity and compassion. Cities across Canada led early on with efforts to address quality of life and mobility needs by opening up streets to non-vehicular uses including cycling, walking, cafes, markets and arts. There are good, compelling reasons to use our streets as a public space resource in regaining some urban vibrancy during the pandemic. While public realm programs are significant, there are a host of other deep challenges that cities need to consider, and address.

While there are some early, positive signs suggesting that Canadian cities are managing during extraordinarily uncertain times, it has also been well established that coronavirus exacerbates pre-existing urban challenges and creates some anew. Both globally and in Canada, the public health crisis has amplified an ongoing equity crisis, a climate crisis and an urban crisis.

This report examines each of these three crises with a focus on: equity and inclusion; climate; and the future of remote work.

2   DISCUSSION THEME: EQUITY AND INCLUSION

2.1 Introduction

There are few better examples of Canada's complex governance framework than planning for housing and transit in our communities. In both cases, critical infrastructure is funded by a combination of municipal, provincial and federal governments, but planned and operated by municipal (or regional) governments.

This arrangement contributes to a number of challenges, which COVID-19 has exacerbated. We can help build more sustainable, equitable cities through targeted infrastructure renewal and construction, but it will require better collaboration between partner organizations to achieve balanced development and learning from innovative practices from other cities in Canada and internationally.

2.2 Trends

Since before the pandemic, local governments have been attempting to address the need for safe, affordable housing through initiatives supporting rental housing, innovative approaches to build their own housing, and programs and shelter for those experiencing homelessness. In some cases, they have developed their own programs and policies (e.g. to support rental housing or secondary suites), but for small to mid-sized cities, the collaboration of the provincial governments is critical. Collaboration with the federal government is critical for non-profits delivering shelter and services to individuals experiencing, or at risk of experiencing, homelessness.

Canadian cities have struggled to keep up with the demand for transit services, whose capital costs are cost-shared with the provincial and federal governments. Operational costs are borne by the local transit authority. Focusing on the transportation options most used by low-income populations (including seniors, students, single parents, immigrants and refugees) and preventing displacement of these populations offer the most benefits. However, many of these tools require the collaboration of provincial governments. In recent years, municipal and regional governments, transit authorities, and community groups have worked together to prevent displacement of residents and local businesses in areas slated for new transit infrastructure such as LRT lines, although these approaches are still unusual in Canada.

2.2.1   Building the Infrastructure: Housing

Building enough affordable housing and transportation infrastructure to meet demand has been difficult in Canadian cities for many years due to waning federal interest in housing, a turbulent economy, and stagnant wages since the late 1970s. With the recent National Housing Strategy (2018), new funding has been devoted to rehabilitating existing affordable units that have fallen into disrepair (e.g. public housing and non-profit-owned units) and building innovative new housing (e.g. modular housing, which is much more affordable than traditional construction). Developers, non-profit organizations, and municipalities have all benefited from this very recent trend: the Rapid Housing Initiative, announced October 27, 2020

through Canada Mortgage and Housing Corporation, devotes $1B to build 3,000 new affordable units across the country, including in the 15 major cities facing critically low vacancy rates.[1]

Before the NHS was introduced, some of the larger local governments created innovative approaches to develop affordable housing within their jurisdictions, such as selling municipal land at below market value to housing non-profits to develop, eliminating property taxes for non-profit housing providers, and selling surplus school sites for redevelopment into affordable housing. Vancouver Affordable Housing Agency was founded to develop 2,500 new affordable units by 2021, particularly those that are needed but not delivered by the private rental market. They have done this by using modular housing, which can be assembled in as little as 30 days, on city-owned sites. In Edmonton, the Cornerstones program (2006-2016) offered capital grants, resulting in the creation or upgrade of 553 secondary suites and 3,300 new homes. Mid-sized and small cities such as Saskatoon, Winnipeg, Regina, and Sherbrooke have relied upon collaborative partnerships with their provincial governments to create capital grants for new rental housing, secondary suites, or supportive housing (Société d'habitation de Québec's Accès Logis and Habitation à moyer lodique programs). However, some of the tools that could enable more affordable units are not allowed in every province: inclusionary zoning, which allows a municipality to ask developers to include a certain percentage of affordable units in their developments, is used in cities such as Montreal, Calgary, Edmonton, and Winnipeg through provincial Planning Acts. In Montreal, in new large residential developments (over 200 units) requiring rezoning, a minimum of 30 percent of units must be affordable[2] and starting in 2021, the city will change this to 20 percent affordable units, or 20 percent for non-profit housing, in developments of over 50 units.[3] Housing reserve funds, which can grow as a result of density bonus contributions from developers or through other development fees, are also not commonplace.

Protecting vulnerable populations is a real challenge in housing: renters, in particular, are poorly protected in Canada. Specific regulations on rent increases depend on the province (e.g. 2.6% in British Columbia, 1.6% in Manitoba), but other provinces have no limits on the percentage increase (e.g. Alberta, Nova Scotia). Any tenant can be evicted if the landlord requires the unit for their own use. In recent years this has included "renovictions", the process of renovating units to increase the property value of the building, resulting in higher rents and displaced tenants. Many owners are now using their units for short-term rentals as well, which effectively removes them from the supply for long-term renters: this has become such a problem that many municipalities have enacted, or are in the process of enacting, by-laws regulating short-term rentals (e.g. Town of Bridgewater, Regional Municipality of West Hants). In cities such as Halifax, with a vacancy rate of 1% in 2020, losing this rental supply has been critical. Providing housing for homeless populations is another challenge as they are typically underfunded, resulting in wait lists for shelter and services.

Like housing infrastructure, public transit infrastructure is also typically funded through all three levels of government, and therefore depends on economic conditions and government priorities. Transit authorities, which are usually operated by municipal or regional governments, rely on fare box revenue

[1] Prime Minister's Office. (2020, October 27). New Rapid Housing Initiative to create up to 3,000 new homes for Canadians. Newswire. https://www.newswire.ca/news-releases/new-rapid-housing-initiative-to-create-up-to-3-000-new-homes-for-canadians-850757493.html

[2] Ville de Montreal, 2006. Habiter Montreal: Strategy for the inclusion of affordable housing in new residential projects.

[3] Scott, M. 2019. Proposed bylaw aims to fix affordable housing dilemma in Montreal. *Montreal Gazette*, June 12, 2019.

for their daily operations, with the remainder coming from taxes. In some cases, transportation authorities can raise additional revenue through short-term taxes, such as an increase to property taxes for a period of two years to fund a new bridge or interchange. They must prioritize transit routes for increased frequency, typically choosing those with the highest ridership, which in turn are usually those in inner city areas with high residential and commercial densities. Suburban routes, which usually operate less frequency, may be used more by some groups, immigrants/refugees, who tend to live in suburban residential areas. This can result in less equitable distribution of transportation service improvements.

2.2.2   Building the Infrastructure: Transit

Municipalities have been struggling to keep up with the rising costs of delivering transit services because they have very few tools to generate revenue (e.g. new taxes), unlike provincial and federal governments. Operational costs for transit authorities include labour costs of drivers, technicians, and office staff, insurance, fuel, and vehicle storage (e.g. garages) and maintenance. Increases in transit frequency along a particular route might be achieved through redistribution of buses from lower-performing routes to those at capacity, or through the purchase of new vehicles. Municipalities typically rely upon support from federal and provincial governments for capital expenditures such as new vehicles, bridges, or transit signals. Private sector companies might also help finance some of the costs of infrastructure, and play a role in its operation.

Transit megaprojects such as Vancouver's Canada line, a 19 km LRT line linking the airport to the downtown, demonstrate this. The Canada Line was built for the 2010 Winter Olympics and included $1.3B in public funding (federal, provincial, and regional governments (Greater Vancouver Transportation Authority), Vancouver International Airport Authority, and the City of Vancouver) supplemented by a $720 million investment from private sector In TransitBC. Investments along the line have been significant, resulting in rent increases and displacement in station areas. In Waterloo Region, Stage 1 of the Ion LRT cost $865M for 19km: $818 in capital costs funded by the three levels of government, with operational funding being funded through transit revenue and a 1.2 percent tax increase approved by the Regional government (2012-2018). The project generated $2.1 billion in building permits within the station areas during its construction from 2011-2016.[4]. By its opening in 2019, it had generated $3.28 B in completed, under construction of building permitted projects in the Central Transit Corridor, equivalent to 13,000 new residential units and over four million square feet of office space.[5] All of this development in transit corridors is exactly what the cities wanted: to control growth by developing more sustainably along mass transit infrastructure. But there is a cost to this approach.

2.2.3   Preventing Displacement

Preventing displacement is a serious concern as cities attempt to build dense, mixed-use transit corridors. Many Canadian cities with high-order transit incentivize development in the transit corridors, but are in need of new tools and approaches to protect against related rent increases and prevent the loss of low- and moderate-income households. Vancouver is attempting to control displacement somewhat with their Development Contributions Expectations policy, which is meant to slow land speculation on the Broadway

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[4] Region of Waterloo. Ion Project Budget Update. Report # TES-RTS-17-07, COR-FSD-17-30.
[5] Editorial. (2019, June 24). Ion Opens—Canada's New Light Rail. Rail for the Valley. http://www.railforthevalley.com/latest-news/zweisystem/ion-opens-canadas-new-light-rail/

corridor, where subway construction is due to start in 2020. The policy charges developers a fee equal of $330 per square foot of habitable space to be paid at the time of occupation.

Many American cities have developed tools to offset displacement in transit corridors. In Washington, a 2015 state statute requires that 80% of the Seattle transit authorities' surplus properties must first be offered for non-profit or affordable housing. In Denver, the Urban Land Conservancy, a community land trust, intervenes in the property market by purchasing sites adjacent to transit stations, and develops them into mixed income, mixed use projects that are deeply affordable. In Metro Los Angeles, the MATCH Loan Program provides loans to developers at low interest rates to build affordable housing or maintain existing units within a half-mile of transit lines. The $75 million in the fund from local, state and non-profit sources is sufficient to preserve or develop 1,500 affordable transit-oriented housing units.

Protecting local businesses is also critical in transit corridors. In Minneapolis and St. Paul, the Ready for Rail Business Support Fund provided forgivable loans to small businesses that showed a decrease in sales due to light rail construction in the Central Corridor. Loans were also created for off-street parking, marketing and buying campaigns, and other technical assistance. Almost five years after construction, almost two-thirds of businesses found that employment and wage levels had not changed, though half reported some decreases in the number of customers. A similar fund in Seattle provided funding and technical support to help businesses stay open, including help with marketing, access plans, signage, façade improvements, bookkeeping, and legal issues.[6]

Community Benefits Agreements (CBAs) are often used in the US, and more recently in Canada (e.g. Vancouver's Southeast False Creek, Eglinton LRT corridor). They allow community groups to negotiate the retention of affordable housing, development of new affordable housing, hiring of local workers in construction of a new project, and many other community benefits in a proposed development. Usually, CBAs are led by developers or community groups, but occasionally the municipality takes the lead. In Atlanta, an ordinance adopted in 2016 intends to compel the City, regional transportation authority MARTA, and Atlanta BeltLine Inc. to share plans and collaborate on their various transportation projects, including ensuring lower income residents are hired to work on construction projects and that minority or female-owned companies receive a significant portion of spending. Community Benefits Agreements specified in the ordinance are intended to guide a share of construction dollars to demographics that do not historically benefit from transportation infrastructure projects.[7] Community groups have become full partners in TOD development in Logan Heights, San Diego and Fruitvale, Oakland. In Fruitvale Transit Village, Unity Council initiated community outreach, working with city officials, Bay Area Rapid Transit, the housing authority, politicians, and local planners to protect Latino retail shops and develop new affordable housing.[8]

[6] Chapple, K. and Loukaitou-Sideris, A. 2019. *Transit-Oriented Displacement or Community Dividends?* Cambridge, MA and London, UK: MIT Press.

[7] [i] https://saportareport.com/atlanta-city-council-back-track-social-equity-transportation-sales-taxes/

[8] Sandoval, G.F. (2018). Planning the barrio: Ethnic identity and struggles over transit-oriented, development-induced gentrification. *Journal of Planning Education and Research*. https://doi.org/10.1177/0739456X1879371

2.3 Emerging Challenges and Opportunities: COVID-19

While developing enough affordable housing to meet demand continues to be a challenge, two housing issues were pivotal during the emergency lockdown order: homelessness and eviction of renters. Service providers scrambled to find enough beds for those experiencing homelessness, and social distancing orders made this very difficult considering the overcrowding situation in most shelters. Many Canadian cities turned to then-empty hotels for overflow housing (e.g. Calgary, Halifax), and in Vancouver this became a permanent solution as the city purchased several hotels to permanently house people experiencing homelessness. The federal government pledged $40M to shelters and sexual assault centres and $10 million to Indigenous Services Canada for shelters on reserve and in the Yukon. Another $175M followed for the Reaching Home program to assist shelters in buying beds and maintain social distancing.[9]

Housing advocates quickly mobilized to suspend rent payments due to surging unemployment and organized online protests to "Keep Your Rent on April 1"[10], which resulted in provincial governments banning evictions over the following months. While some have ended their eviction moratorium periods (e.g. Alberta, British Columbia, Manitoba), others have extended support to renters and landlords. Some provinces/territories added rent supplements for tenants (e.g. British Columbia, Prince Edward Island, Northwest Territories) and some froze rent increases for 2020-21 (e.g. Manitoba). For commercial tenants, the federal government introduced the Canada Emergency Commercial Rent Assistance program (cost-shared between CMHC and the provinces) to help small businesses who saw a 70% decrease in income to pay their rents until June 2020.

During COVID-19, cities saw their transit farebox revenues plummet due to the emergency lockdown, followed by months of work disruption. The Canadian Urban Transit Association noted that ridership was down as much as 75 percent.[11] and, along with FCM, called for $400M per month in emergency funding to replace farebox revenue, without which transit cannot continue to operate. FCM also called on the federal government to provide at least $10 billion in emergency funding to fill the operating gap, including $2.4 billion in direct federal allocations to municipalities with transit systems On June 5, the federal government committed $14 B towards provincial restart funds, which includes emergency funding for public transit. In both cases, public transit was framed as a critical service necessary for a full economic recovery. In Ontario, the Rebuilding and Recovery Act, introduced for first reading on October 22, 2020, would include "various measures designed to both expedite the delivery of enhancements to highway and public transit infrastructure, and to encourage the continued development of transit-oriented communities and affordable housing in Ontario." This includes projects outside of the GTA to be designated as priority transit projects, which would streamline their development processes.[12]

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[9] Government of Canada. (2020, April 4). Canada announces support to those experiencing homelessness and women fleeing gender-based violence. Press release. https://www.canada.ca/en/employment-social-development/news/2020/04/canada-announces-support-to-those-experiencing-homelessness-and-women-fleeing-gender-based-violence-during-the-coronavirus-disease-covid-19-pandemic.html

[10] LeadNow. (2020, March 27). Video petition to cancel rent and mortgages. https://act.leadnow.ca/cancel-rent-video-petition/?utm_source=&utm_medium=email&utm_campaign=blast2020-03-28

[11] Wanek-Libman, M. (2020, April 1). CUTA sends transit financial aid to federal government. Mass Transit. https://www.masstransitmag.com/management/article/21132209/cuta-sends-transit-financial-aid-request-to-canadian-government

[12] Doyle, C., Johnson, M. and Ferguson, C. (2020, October 26). Pedal to the Metal: Ontario accelerates transit and highway infrastructure projects. Blakes. https://www.blakes.com/insights/bulletins/2020/pedal-to-the-metal-ontario-accelerates-transit-and?utm_source=Mondaq&utm_medium=syndication&utm_campaign=LinkedIn-integration

Focusing on transit and cycling has been a key strategy in many Canadian cities, and during COVID-19, cities from Hamilton to Victoria introduced temporary installations to allow wider sidewalks and bike lanes. This allowed most people to exercise and travel around the city while maintaining physical distancing requirements. Cycling programs for immigrants and refugees, such as HUB Cycling's Newcomer Bike Host and Learn to Ride courses in Vancouver and CultureLink/Cycle Toronto's Bike Host program, have resulted in participants cycling more, making new social connections, and feeling a sense of belonging and settlement.[13] Most participants did not cycle at all before completing these programs.

In many areas of the country, people do not live in large, densely planned cities that can easily support conventional transit options. Microtransit options are better suited to suburban or rural areas: it includes on-demand bus service without a fixed route, car and vanpooling, electric bicycles, and ridesharing such as Uber and Lyft, often delivered through partnerships with the private sector. For example, in Rimouski, the TaxiBus service uses taxis on fixed and variable routes in areas of the city with low densities with a fare of $3.75, the same as their conventional bus service.[14] The Rural Transit Association, a non-profit in Nova Scotia, provides a single point of contact (www.ruralrides.ca) for rural residents to book on-demand transit in 18 different communities.[15] The service, allowing collaboration between different transit providers, is considered critical in aging communities, where an increasing percentage of residents are no longer able to drive. Services like this have enabled residents to access their medical and other appointments without owning a car.

2.4   Conclusion

Building affordable housing and public transit infrastructure in Canada has always been a complex undertaking. Multiple levels of government must coordinate with the non-profit and private sectors to take advantage of funding and development opportunities. While some local governments have been able to develop their own programs to build affordable housing, most rely upon collaborations with their provincial governments and in some cases community-based organizations. Lax tenant protection across the country (e.g. from evictions) and permanent shelter for people experiencing homelessness were two of the issues exposed during the COVID-19 lockdown. For public transit authorities, the constant struggle to operate through farebox revenue came to a crisis point in 2020, when transit ridership plunged during the summer. During this time, investments in cycling and transit infrastructure took off as cities sought to allow social distancing on sidewalks and bike routes. With increases in federal funding for affordable housing and support for transit authorities to weather the storm of COVID-19, there has been an increased emphasis on transportation as a means to allow critical workers such as grocery store clerks and hospital workers to get to work. While we badly need new transit infrastructure in growing cities, Canadian cities should learn from others on how to avoid both residential and commercial displacement in transit corridors through business support funds and protection of existing housing (e.g. through community benefit agreements). Microtransit options and cycling programs for new immigrants/refugees are among some of the additional options for smaller cities or rural areas.

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[13] McBurney, M. and Laban, S. (2020). A Review of Newcomer Bike Mentorship Programs in Canada. Guelph, ON: The Guelph Lab.

[14] https://www.rimouskibus.com/pages/taxibus

[15] https://ruralrides.ca/

3 DISCUSSION THEME: CLIMATE CHANGE AND URBAN RESILIENCY

3.1 Introduction

The realities and impacts of climate change on cities are growing, and urban leaders are at the forefront of climate mitigation and adaptation efforts. Insured losses in Canada have exceeded CAD $1 billion per year for the past five years with 70% of cities already being impacted by extreme weather events linked to climate change. In the last two years, more than 300 Canadian cities have declared "climate emergencies".

FCM has estimated that for every $1 billion invested in climate change efforts, $6 billion in costs can be avoided.[16] At the same time, COVID-19 has created new challenges for cities across Canada, many of whom are already struggling to generate the capital and resources needed to address climate change, while reinforcing the importance of building resiliency into the social, economic, and environmental fabric of cities. Climate change targets and plans remain as important as they were pre-pandemic, and local governments face a unique challenge of carrying out climate change mitigation and adaptation objectives and targets within the constraints of the pandemic.

Reduced travel and economic activity – a result of the pandemic – temporarily slowed the rise of global greenhouse gas (GHG) emissions over the last several months, and placed a spotlight on how the shift from "business as usual" has benefited the environment. However, this pause is unlikely to continue for long and it is important for Canadian cities to be prepared to address the climate change risks and opportunities in the "after times". There are, in fact, opportunities for cities to leverage climate change mitigation and adaptation as a means of regaining economic stability, health and safety, and social connection. Mobility and transportation, housing and densification, resilient infrastructure, and emergency response are priority areas for government collaboration, with local governments at the forefront of looking ahead and rolling out proactive policies that support both political commitments to climate change and Canadians' livelihoods as the pandemic evolves.

3.2 Trends

Pre-pandemic, many Canadian cities were already focused on carrying out their climate change mitigation and adaptation action plans to achieve emission reductions, make their communities more resilient, and contribute toward the national target of net zero emissions by 2050.[17]

While municipal strategies vary from region to region, as well as from province to province, municipal climate plans across Canada are working towards net zero and adaptation focused on five key areas, as outlined in Figure 1 below.

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[16] See: https://fcm.ca/en/news-media/news-release/climate-adaptation-estimated-cost-municipalities-5-billion-annually
[17] See: https://climatechoices.ca/getting-to-zero-canada-plans-to-hit-net-zero-emissions-by-2050-whats-next/

Green Buildings	Low Carbon Transportation	Green Infrastructure	Waste Management	Low Carbon Energy
• Energy efficient upgrades / renovations to existing buildings • Net zero building new construction • Green roofs and walls • Water efficient systems	• Electric vehicles and charging infrastructure • Low carbon heavy duty vehicles and transit • Active mobility networks (incl. cycling and walking) • Low carbon fuels	• Rain gardens • Permeable pavement • Urban parks, forests, and green spaces • Green stormwater management • Ecosystem restoration (incl. wetlands)	• Zero waste strategies • Organics management • Wastewater treatment • Waste to energy systems	• Solar PV power and hot water • District energy to heat or cool buildings (incl. biomass and biogas) • Small wind and micro hydro • Micro grids and energy storage

Figure 1: Climate change mitigation and adaptation priorities within Canadian cities.

Local governments increasingly recognize the need for green infrastructure investment and the use of natural systems to mitigate flooding and other impacts from severe weather,[18] as well as to decarbonize transportation, energy systems, and buildings.[19]

The process of greening cites by addressing each of the key areas above can achieve numerous benefits, given the density and interconnectedness of urban environments. For example, planting urban forests provides shade during heat waves, stabilizes soil, helps sequester carbon and improve air quality for citizens, and aids in the management of stormwater runoff that is the culprit of damage from flooding.[20] However, within the context of the pandemic, it is this same density and interconnectedness that presents a challenge to municipal governments as they work to support local businesses, promote citizen safety and health, and offer reliable city services, all while building toward the targets and progress set out in their climate plans. While the trends outlined above remain just as relevant as they were pre-pandemic, how they are carried out over the coming months and years will drive innovation in addressing the added level of complexity that is now inherent in how cities operate within the COVID-19 context.

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[18] See: https://greeninfrastructureontario.org/app/uploads/2020/07/Economic-Impact-Assessment-of-GI-Sector-in-Ontario_UPDATED_july20-20.pdf

[19] See: https://www.nationalobserver.com/2020/05/10/news/cut-carbon-emissions-movement-grows-electrify-everything

[20] See: https://climateatlas.ca/canadian-cities-and-climate-change

3.3 Emerging Challenges & Opportunities

The most agile responses to the pandemic have come from cities that moved quickly to contain the virus and undertook innovative measures to implement lockdowns, support local business and supply chains, maintain essential services, promote physical distancing across buildings, transit, and pedestrian pathways, and maintain emergency response and safety networks.

There is an opportunity to apply this type of agility and creativity to address resiliency and adaptation to climate change in order to transform cities in a way that not only protects citizens from immediate threats coming from the pandemic, but also builds resiliency to climate impacts over the longer-term.[21] COVID-19 can also be a catalyst for cities to accelerate what has already been planned to address climate change, such as installing cycling networks that connect city centres with surrounding neighbourhoods.[22]

At the same time, new challenges have arisen. As municipal revenues continue to be impacted by pandemic-related causes, including service reductions in public transit and property tax deferrals, there is a risk cities will be forced to delay, or reduce investment in, essential climate mitigation and adaption planning and governance (e.g., the ability to execute on strategies and action plans).

In Vancouver, work was already underway on their Climate Emergency Action Plan prior to the COVID-19 pandemic[23], and actions have been designed to align with COVID-19 recovery objectives as much as possible. This includes deploying infrastructure more rapidly, incorporating a stronger equity lens into regulatory and pricing tools, and considering the need for physical distancing and remote work. According to the staff report that went to Council on November 3, 2020, the response to the pandemic and climate crisis "*similarly need to include bold efforts to reduce carbon pollution and better preparations for the unavoidable impacts of climate change, while prioritizing actions that help minimize health and economic impacts and help build a more equitable society. This recognizes that health, the economy and the climate are inextricably linked and are building blocks for a strong and resilient city*."

In terms of climate change risks and impacts, one recent report found that based on analyzing 39 studies across US, Europe, Asia, and the Middle East, while teleworking may reduce transportation related GHG emissions generated from the office commute, it may also lead to increased energy use due to greater use of less efficient home appliances, heating, cooling, and lighting, as well as a sharp increase in digital services such as videoconferencing and cloud storage.[24]

The following table outlines a few examples of more specific emerging challenges that cities are facing, as well as some opportunities that not only address the challenge but align with GHG reduction strategies and overall support of climate change targets.

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[21] See: http://www3.weforum.org/docs/WEF_Challenges_and_Opportunities_Post_COVID_19.pdf
[22] See: https://www.resilience.org/stories/2020-08-20/how-the-twin-disasters-of-climate-change-and-covid-19-could-transform-our-cities/
[23] See: https://council.vancouver.ca/20201103/documents/p1.pdf
[24] See: https://reutersevents.com/events/reports/docs/magazine-october-2020.pdf

Emerging Challenges	Emerging Opportunities
Reduced transit service and capacity to promote social distancing and safety of bus operators	Increased investment in alternative, low carbon modes of transportation (e.g. bike lanes, pedestrian infrastructure).
More demand for deliveries and less in-person business	Investment by surviving businesses on automated solutions, localized production, electric scooters and vehicles for delivery, and digital platforms that drive GHG reductions.
Fewer people commuting to city centres with more people working remotely from home	Development and intelligent design of mixed-use zoning for buildings / retrofitting of buildings to reduce physical proximity in tandem with green building retrofits.
Need for more access to open green and outdoor spaces to allow for responsible social distancing and mental health breaks	Channel COVID-19 related economic recovery spending into the expansion of green infrastructure that provides more green spaces while also supporting biodiversity, carbon sequestration, and stormwater management.[25]

3.4 Climate Change & Urban Resiliency Sub-themes

The following sections expand on the sub-themes as they relate to climate change and urban resilience, exploring best practices that are emerging from cities within and outside of Canada. The sub-themes are: (1) Land Use, Energy Systems, and the Built Environment; (2) Transportation and Mobility; and (3) Resilient Infrastructure.

3.4.1 Land Use, Energy Systems, and the Built Environment

Balancing priorities and making decisions regarding land use and the built environment is a core function of local governments in Canada and around the world. Cities and towns engage their residents and businesses in planning processes to create roadmaps for development and renewal in the form of General Plans or Official Community Plans. These planning processes touch many aspects of city building, including:

- Where to locate different building types and how to support transit-oriented development through bylaws and zoning;
- Providing adequate housing in proximity to services;
- Efficient delivery of utilities and energy systems; and
- Preserving space for public gathering space, parks, and urban agriculture*.*

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[25] See: https://www.resilience.org/stories/2020-08-20/how-the-twin-disasters-of-climate-change-and-covid-19-could-transform-our-cities/

A recent article from the Bloomberg CityLab[26] highlights a major transformation that is taking place on city streets in response to COVID-19 – expanding sidewalks, outdoor patios, and other public spaces to allow for adequate physical distancing. Space was already at a premium in most cities pre-pandemic, and the additional need for space is presenting design challenges in congested urban environments. Many of these measures were implemented relatively quickly and designed to be temporary, but public support for permanent networks may endure well beyond the pandemic.

Another challenge for cities in the face of climate change and COVID-19 impacts is the impact on commercial building space. Building owners and managers are experiencing significant disruptions in the commercial real estate market as some businesses have been forced to close and office workers stay home. This has resulted in commercial, institutional, and industrial building owners who are less likely or able to invest in retrofits without a stable income from tenants or as a result of reduced tax revenues (as in the case of government owned buildings). Governments may need to retool their commercial retrofit programs to fit this new reality, as GHG emissions reductions from commercial buildings are an important climate solution for urban centres across the country.

Challenges associated with providing an adequate supply of affordable housing are not new to Canadian municipalities, but now there is increased pressure in this area with so many people experiencing economic hardship from the effects of the pandemic. In the September 2020 Speech from the Throne, the federal government announced a supplement to the National Housing Strategy in the form of rapid housing in the short-term, and partnerships with non-profits and co-ops in the mid- to longer-term.[27] From a climate change perspective, homes and buildings contribute almost 13% of Canada's greenhouse gas emissions.[28] As a result, this an excellent opportunity for municipalities to 'build back better' by integrating energy efficiency with their housing strategies. Energy-efficient new builds and retrofits provide an effective pathway towards economic recovery as they can help generate 8-27 local jobs/$ million,[29] provide employment to a wide range of labor types, and increase consumption of local materials. Energy retrofits can also reduce energy costs by 40-60%[30] and contribute to an average of $114/year[29] in savings per household. As a result, energy-efficient homes can not only reduce costs for Canadian families in this difficult time but also help provide much-needed employment and economic growth.

Discussions around resilient energy system infrastructure, both pre-pandemic and during the current recovery, has also pointed to the increased use of smart and decentralized energy technologies as part of resilient urban design. For example, smart micro grids to create resilient electricity systems that can also support electrification of buildings and EV charging.

Before the COVID-19 pandemic, municipalities were increasingly interested in Transit-Oriented Development (TOD), which focuses on mixed-use and high-density urban environments with easy access to public transit. TODs reduce the need for private vehicles, thereby reducing greenhouse gas emissions

[26] See: https://www.bloomberg.com/features/2020-city-in-recovery/
[27] See: https://www.canada.ca/en/privy-council/campaigns/speech-throne/2020/stronger-resilient-canada.html
[28] See: https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/sources-sinks-executive-summary-2020.html
[29] See: https://www.pembina.org/reports/bc-building-retrofits-recovery-2020.pdf
[30] See: https://data.fcm.ca/documents/resources/gmf/sah-why-undertake-energy-efficiency-retrofits-gmf.pdf

as well as noise and air pollution. This makes TOD very attractive for residents as evidenced in Boston. In the early 2000s, the train line running between the Boston central business district and the southern outskirts of the city only had three stops. When the Massachusetts Bay Transit Authority added four new stations, TOD was invigorated in communities around this route leading to 1,500 rebuilt housing units, the development of 72,500 square meters of commercial space, and 1,300 jobs.[31] While the pandemic has raised awareness about the challenges of increased density, recent studies by organizations such as EY[32] show that it is highly likely that TOD is here to stay, albeit with a few modifications. This may include modifications that address physical distancing, sanitation, air quality, and remote work, and will require innovation from urban planners and developers to build more adaptable spaces that can be easily reconfigured. This may also include incorporating features such as modular interiors, knock down and soundproof walls, easily accessible handwashing infrastructure, and additional platforms/spaces at transit stations.[33]

Finally, the municipal land use and development process is another area where climate mitigation and resiliency measures often take shape. While public engagement measures do not always include a significant GHG reduction benefit, effective communication and engagement by municipalities is an important factor in advancing climate policy and action. Whether it is energy efficiency performance standards, incorporation of urban agriculture and green roofs, or innovative water management and reuse systems, developers negotiate trade-offs with municipalities in the form of increased density for community amenity contributions. In the past, these processes have favoured the voices of those with the free time and energy to attend public hearings in person, often resulting in public barriers to participation in smart growth and density discussions and decisions.

This more accessible format has the potential to engage a broader range of voices in municipal land use and development processes in the future. The American Planning Association has also compiled a long list of COVID-19 resources for cities, including a list specific to online engagement and public participation.[34]

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[31] See: http://www.mapc.org/wp-content/uploads/2020/02/MAPC-TOD-Report-FINAL-web-reduced-size.pdf
[32] See: https://assets.ey.com/content/dam/ey-sites/ey-com/en_ca/topics/real-estate-hospitality-and-construction/pdf/ey-covid-19-impacts-on-transit-oriented-development-projects.pdf?download
[33] See: https://www.entuitive.com/ensight-trend-home/will-coronavirus-kill-transit-oriented-development/
[34] See: https://www.planning.org/resources/covid-19/#public

Case Study: Get Growing, Victoria

A tourist destination known as the "City of Gardens", every year Victoria puts significant resources into urban landscaping in the form of garden beds and hanging baskets. In response to increased food security risk due to the pandemic, staff and council recognized an opportunity to shift resources, support vulnerable residents, and strengthen the local food system. One of the City's greenhouses usually used for hanging basket plant starts was used instead to grow vegetable and herb starts. Introduced in March 2020, the program saw the City working together with over 40 community organizations to distribute more than 80,000 starts to residents.*1* This initiative helped address food security goals within its Official Community Plan, reduced transportation related GHG emissions by growing more food locally, and built on a suite of leading food policies under Victoria's Growing in the City initiative.*1* This is another example of a successful COVID-19 response that has the potential to become permanent, as Victoria City Council is considering making this an ongoing annual program.

Case Study: City of Edmonton Environmental Programs for Economic Recovery

In June 2020 the City of Edmonton launched a series of environmental programs to kickstart the economic recovery while working towards climate change goals.*1* These programs are a combination of new and existing programs, revamped to address the challenges residents and businesses are facing in the context of COVID-19. Covering several areas of the City's Energy Transition Strategy and Climate Change Adaptation Strategy, the programs include a Building Retrofit Accelerator rebate and a rebate for installing a Level 2 electric vehicle charging station. The programs also include an innovative partnership with Google and MyHeat, a tool to visualize solar potential and understand energy efficiency while providing opportunities to reduce consumption and save money.

3.4.2   Transportation and Mobility

Municipal priorities in sustainable transportation and mobility include rolling out low-carbon public transit options, promoting active transportation through investment in pedestrian and cycling infrastructure, building out electric vehicle (EV) charging station infrastructure, and adopting low-carbon fuel options for municipal fleets. These investment areas are no less important mid-pandemic, and are even more relevant for the long-term (e.g., cycling and walking); however, the municipal funding models that support progress in these areas are undergoing significant changes due to constraints around physical distancing and public health guidelines.

In response to COVID-19, transit operators in cities across Canada were forced to reduce services given the drastic drop in ridership and need for physical distancing, and cities experienced further impacts from reduced business and economic activity. Canada-wide, travel with public transit in urban areas decreased by 75%.[35] This response impacted many vulnerable populations across Canada who depend on transit to commute to work, access essential services, and to provide care to family.[36]

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[35] See: https://www.wsp.com/en-GL/insights/rail-and-the-effects-of-the-covid-19-pandemic

[36] See: https://theconversation.com/giving-up-public-transit-during-the-coronavirus-is-a-luxury-many-canadians-cant-afford-138875

The reduction in transit service also shifted dependence to other modes of transportation, namely increased car purchases and usage, as well as micro-mobility solutions such as cycling, scooters, and walking. Micro-mobility solutions like scooters can have a positive impact on relative GHG emissions, as they are typically powered by electricity.

Where cars are necessary, increasing investments in incentives and charging infrastructure are helping to shift the broader fleet to zero emission vehicles (ZEV). In 2019, the Government of Canada announced a $130 million investment to deploy a network of ZEV charging and refuelling stations over the next five years.[37]

COVID-19 has also pushed city planners to accelerate the roll out of more 'smart' mobility measures that enable more efficient service as fewer bodies can be on board buses, trains, subways, and ferries due to physical distancing rules (e.g., installing more express bus lanes to keep service moving, service tracking apps, and high-frequency schedules).[38]

In addition to service updates, transit operators are implementing best practice measures such as disinfection routines on all public transit vehicles, application of new technologies to track passengers and fevers, and planning for future-ready design (e.g., seating where every other passenger is facing forward or backwards).[39] [40]

Many cities around the world are also investing heavily in active transportation networks, responding to residents who are avoiding transit but are not interested in or able to acquire a car. In the case of Paris, France, for example, a plan was already in place to make every street in the city cycle-friendly by 2024 and make neighbourhoods more walkable[41] – not unlike many leading Canadian cities. Concerns about congestion and maintaining public health on transit led to the creation of a 50-kilometer network of temporary bike lanes in the spring of 2020 following the initial lockdown. As of July 2020, these temporary bike lanes are now expected to become permanent as part of a campaign promise from re-elected mayor Anne Hidalgo.[42]

In Canada, COVID-19 kickstarted a significant number of temporary and permanent projects to expand and update cycling and walking infrastructure, providing more space and options to move around cities. As a low carbon transportation solution, cycling has several benefits if the infrastructure and incentives hold up, and COVID-19 has provided municipalities with an opportunity to both invest in and test better infrastructure.[43]

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[37] See: https://www.canada.ca/en/natural-resources-canada/news/2020/02/canada-invests-in-ontarios-electric-vehicle-network.html

[38] See: https://nacto.org/wp-content/uploads/2020/05/NACTO_Streets-for-Pandemic-Response-and-Recovery_2020-05-21.pdf

[39]See: https://www.wsp.com/en-GL/insights/rail-and-the-effects-of-the-covid-19-pandemic

[40] See: https://cutaactu.ca/covid-19

[41] See: https://www.forbes.com/sites/carltonreid/2020/04/22/paris-to-create-650-kilometers-of-pop-up-corona-cycleways-for-post-lockdown-travel/

[42] See: https://www.rfi.fr/en/france/20200701-paris-temporary-bike-lanes-to-become-permanent-after-hidalgo-re-election-mayor-green-pollution-cars

[43] See: https://data.fcm.ca/documents/COVID-19/COVID-19-Street-Rebalancing-Guide-EN.pdf

3.4.3 Resilient Green Infrastructure

Pre-pandemic, spending on natural green infrastructure (i.e., nature-based climate solutions) was a focal point for some cities as a means of building resiliency and creating jobs,[44] particularly through upgrades to roads and water systems to manage stormwater runoff, such as with green roofs and walls, bioswales, the use of permeable pavement, restored wetlands, and increasing the cover of urban parks and forests.[45]

Case Study – City of Toronto Green Streets Project

An example of a green infrastructure project that will benefit from federal support as cities regain their economic footing is the Green Streets project in the City of Toronto. While a number of projects have been completed, many more are in the planning stages to scale across the city, especially as a COVID-19 recovery strategy. For example, the project installed the city's first use of a tree planting technology (soil cells) to treat and improve stormwater road run-off while planting growth of new trees.1 Alongside the implementation of soil cells across the city, urban and suburban bioswales (a vegetated channel to collect and concentrate stormwater runoff) were built to increase green space and act as a point of community education around stormwater management. Both efforts speak to a larger opportunity for cities to increase their green space not only as a tool in water and carbon management, but to provide citizens with more space to be socially-distanced outdoors and connect with nature during a stressful and uncertain times.

While the gears were in motion for green infrastructure projects across Canadian communities, they slowed as financial and human resources shrank and have been diverted in response to COVID-19. To address this issue and leverage these investments as part of the recovery, the federal government's Investing in Canada Infrastructure Program has been updated to include a new stream designed to deliver more green infrastructure projects during the pandemic by broadening the types of eligible projects and accelerating project approvals.[46] By providing this funding to incentivize cities to integrate resilient green infrastructure design into city planning, it also encourages decision-makers to re-think the value of infrastructure assets and take on a more wholistic, systems-based approach to smart urban design.[47]

While the use of vegetation, permeable surfaces, rain barrels, and green roofs are fairly standard best-practice tools for cities, the re-thinking of urban design using green technologies and smart city infrastructure (such as artificial intelligence and sensors to detect problems before they arise)[48] has led to new applications of more efficient solutions.[49] The pandemic has been spearheading the need for increased digitization and ICT (i.e., smart city) infrastructure to ensure safe, effective service delivery while minimizing interaction – which can also bring positive carbon reduction benefits.

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[44] See: https://greeninfrastructureontario.org/app/uploads/2020/07/Economic-Impact-Assessment-of-GI-Sector-in-Ontario_UPDATED_july20-20.pdf

[45] Ibid.

[46] See: https://www.nationalobserver.com/2020/09/01/news/ottawa-invests-285m-bc-green-infrastructure

[47] See: https://futurecitiescanada.ca/stories/resilient-cities-post-covid-19-accelerating-innovation/

[48] See: https://futurecitiescanada.ca/stories/resilient-cities-post-covid-19-accelerating-innovation/

[49] See: https://delphi.ca/2020/07/investing-in-green-infrastructure-a-win-win-for-economic-recovery/

4   DISCUSSION THEME: THE FUTURE OF WORK

4.1   Introduction

For many Canadians, one of the most evident changes during the pandemic has been the increase in remote work, creating a dramatic shift in commuting patterns and increased demand on broadband and information and communication technology (ICT) networks and virtual platforms. This new work environment has reshaped the utility of institutional, commercial, and industrial (ICI) real estate, and impacted worker recruitment and potentially tax revenues for local governments as corporate operations are becoming more distributed outside of city centres. With fewer people spending their time and money in city centres, the potential economic repercussions are significant.

Collectively, these changes have also served as catalysts for new ways of serving communities and doing business, including the significant growth in demand for digital services from cities and businesses alike.

Many of these changes are expected to continue for the long-term, while the direction and sustainability of other trends, such as those observed in residential and commercial real estate, are less clear.

This chapter explores the trends emerging from increased remote work on cities, how these trends are shaping new challenges and opportunities, and how cities across Canada are applying solutions to adapt for the future.

4.2   Trends

Remote work has drastically re-designed the workplace, with many of the changes expected to endure beyond the pandemic itself. A push for a more mobile and flexible workforce, if sustained, will lead to shifting tax structures, increased revenue risks, and increased complexity in payroll reporting and compliance.

Pre-pandemic, the shift to more remote work was already a growing workforce trend. According to Statistics Canada, nearly 40% of Canadians are in jobs that can plausibly be done from home.[50] Another report released before the pandemic by global staffing firm Robert Half reinforces the shift to remote working, citing that 43% of Canadian firms offer the option to work off-site, while 36% opted not to work from home because they did not have the right technology and/or were concerned about the risk of reduced productivity due to distractions.[51]

This reflects the concurrent trend of workers demanding more flexible work schedules and locations from their employers, driven by factors that include the rising costs of city living, the availability of virtual platforms that allow colleagues to connect from anywhere, and the demand from the incoming workforce for the agility and ability to carry out a healthy work-life balance.[52]

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[50] See: https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00026-eng.htm#n1-refa
[51] See: https://www.benefitscanada.com/news/43-of-canadians-offered-remote-working-options-survey-141881
[52] See: https://www.regus.ca/work-canada/wp-content/uploads/sites/131/2017/06/GBS-Report.pdf

The impact of the shift in worker demands over the past few years has translated into the growth of flexible workspaces, which saw a footprint increase from 1.5 million square feet (s.f.) in 2014 to 6.1 million s.f. in 2019 in Canada, with an additional 1.3 million s.f. of flexible real estate expected in the coming years.[53] The pace of this expansion has been most pronounced in downtown centres, however it is expected that demand for flexible space in suburban markets will increase, particularly in cities like Vancouver where more people are moving for affordable commercial and office space.[54]

While remote work has become even more prevalent among Canadians due to COVID-19 and aligns with trends pre-pandemic, the work is largely taking place from people's homes. This is impacting the flow of workers and money in city centres, pushing local governments to re-think business models and urban planning to adapt to the new reality of work.

4.3   Emerging Challenges & Opportunities

The sudden spike in the number of people working from home is impacting how cities operate. The biggest impact and challenge that cities are facing is related to primary revenues generated from real estate, parking, and transit.[55] [56] RBC projections estimate that municipal shortfalls across Canada could reach nearly $12 billion this year.[57] As local economies work to re-start, municipalities will continue to face increased costs across numerous services lines such as growing shelter capacity subsidizing affordable housing, and providing emergency daycare for front line workers[58], compounded by the risk of further shutdowns as the pandemic persists.

Cities are also preparing for the possibility of a partial exodus of city dwellers who no longer need to live close to work, and an influx of workers to smaller communities that offer a more affordable cost of living. While the degree or longevity of this shift may not be as dramatic or quick as once thought, smaller communities still face the possibility of a population increase and subsequent demand on local services and infrastructure, namely reliable ICT networks and bandwidth that will present local officials with challenges in funding and ramping up infrastructure to meet demand.[59]

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[53] See:
http://cbre.vo.llnwd.net/grgservices/secure/Canada_Flexible_Real_Estate_Report_2019.pdf?e=1602194588&h=5667cb127f2d2be0a905ba8f10aad319
[54] See:
http://cbre.vo.llnwd.net/grgservices/secure/Canada_Flexible_Real_Estate_Report_2019.pdf?e=1602194588&h=5667cb127f2d2be0a905ba8f10aad319
[55] See; https://thoughtleadership.rbc.com/canadian-city-finances-ailing-from-covid-19/
[56] See: https://www.brookings.edu/blog/the-avenue/2020/03/31/when-will-your-city-feel-the-fiscal-impact-of-covid-19/
[57] See: https://thoughtleadership.rbc.com/canadian-city-finances-ailing-from-covid-19/
[58] See: https://thoughtleadership.rbc.com/canadian-city-finances-ailing-from-covid-19/
[59] See: https://theconversation.com/the-coronavirus-pandemic-is-pushing-canadians-out-of-cities-and-into-the-countryside-144479

4.4 Impact of Remote Work and Key Considerations for Cities

Solutions are underway across Canadian cities to tackle the challenges associated with increased remote work while pushing forward solutions that have far-reaching economic, social, and environmental benefits. The following subthemes across real estate, transit, ICT networks and small businesses explore these challenges and opportunities as cities adapt to the new realities of remote work.

TABLE 2: EMERGING CHALLENGES AND OPPORTUNITIES FROM THE TREND TOWARD MORE REMOTE WORK.

Emerging Challenges	Emerging Opportunities
Fewer workers commuting to city centres using transit and/or private vehicles	Reduced greenhouse gas (GHG) emissions from commuting, helping cites move toward their climate goals.
	Opportunity to turn parking lots into green and open spaces for safe gathering outdoors given demand for parking has dropped (up to 90% during the first month of the pandemic for example).[60]
Economic impact of fewer workers using downtown services and infrastructure	Opportunity to expand services and infrastructure in neighbourhoods further from the downtown core.
Greater demand for bandwidth and reliability from ICT networks	Opportunity for innovation around online, virtual platforms.
	Opportunity to invest in resilient and reliable ICT networks to offer more public wi-fi and access to wi-fi in underserved neighbourhoods.
Shifts in the occupancy and utility of building space across ICI sector real estate	Better standards for indoor air quality and safety, lower occupancy, and installation of protective barriers[6] coupled with opportunity to design more flexible ICI buildings and workspaces.

4.4.1 Real Estate and Buildings

Commercial Real Estate

The COVID-19 pandemic has abruptly and massively changed the ICI building sector, especially the commercial real estate (CRE) sector as offices have closed and employees have started working from home – in some cases indefinitely. The way people inhabit physical space has fundamentally changed, and many pre-pandemic trends such as open-plan office spaces may start to reverse. Building codes may change to require higher standards for indoor air quality and safety, lower occupancy, and installation of protective barriers.[61] The longer this crisis persists, the more permanent the current changes are expected to become, pushing the CRE sector towards radical transformation.

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[60] See: https://www.bloomberg.com/features/2020-city-in-recovery/
[61] See: https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/commercial-real-estate-must-do-more-than-merely-adapt-to-coronavirus

The City of London, England, for example, has witnessed increased demand for flexible commercial office space, in some instances by 114%, in towns on the outskirts of the city centre, also termed "second-tier" cities.[62] An Arcadis survey found that while offices will remain important for fostering collaborative work, their sizes will likely decrease and need to become more flexible. Further to that, the survey found that large city centre properties will become increasingly difficult to own and manage as the pandemic carries on. Though this is in some part due to COVID-19, the shift in workplaces has also made people realize the time they are gaining and putting towards family and leisure time by avoiding work-related commutes.[63]

CBRE released the most recent statistical evidence of COVID-19's impact on commercial real estate in major Canadian cities, indicating the significant impacts in Vancouver and Toronto. For Vancouver, the downtown office vacancy rate rose 3.3% in the second quarter, up from 2.2% in the first quarter, while the amount of sublet space in Vancouver's downtown core rose 200% from the previous quarter, totalling 219,000 s.f. of available space on the market.[64] Similarly, and more pronounced, Toronto's downtown has a total of 650,000 s.f. of vacant office space available for sublet, an 86% jump from the first quarter.[65]

Case Study: Resources for Healthy Building Re-opening during COVID-19

COVID-19 has highlighted the importance of worker health and well-being, and has put more focus on healthy buildings through improved ventilation, natural light, and safer materials, as more time is being spent indoors as cities undergo different stages of quarantine and lockdown. The Canada Green Building Council has gathered a list of guidelines and tools to help businesses and building operators across Canadian cities prepare a work environment that is healthy and safe for tenants. Resources are categorized across water, green cleaning, building heating, cooling, and air quality, and general building opening procedures.

While the dispersing of office workers is impacting commercial office space vacancy, it is also impacting economic activity for restaurants, bars, and cafés, as well as many retail businesses in downtown cores. With fewer people commuting downtown, many small businesses have been forced to close due to reduced business, impacting both employment rates and retail space vacancies. However, as cities enter phases of reopening, some businesses have been able to bring employees back by offering more outdoor seating, pop-up patios and plazas, as well as repurposing curb lanes for physically distanced customer line ups and waiting areas.[66]

The future business outlook for the CRE sector may also change across demographics, locations, and industries. Hospitality properties and short-term rental markets are also set to change significantly as work and leisure travel is reduced. As the consumer shift to online shopping accelerates, the already

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[62] See: https://reutersevents.com/events/reports/docs/magazine-october-2020.pdf
[63] See: https://reutersevents.com/events/reports/docs/magazine-october-2020.pdf
[64] See: https://www.cbre.ca/en/about/media-center/cbres-second-quarter-statistics-show-covid-19s-impact-on-canadian-commercial-real-estate
[65] See: https://www.cbre.ca/en/about/media-center/cbres-second-quarter-statistics-show-covid-19s-impact-on-canadian-commercial-real-estate
[66] See: https://vancouver.ca/home-property-development/making-streets-for-people-program.aspx

strained shopping mall sector model is facing a tipping point, while demand for industrial and warehouse space has soared.[67]

Given the tremendous challenges the CRE sector faces, key players must take immediate action to recover from this pandemic and build resiliency for the future. Frontrunners in this area will not only transform themselves to adapt to a new work culture but must also continue to address long-term risks such as climate change. As regulatory pressure rises on energy-intensive buildings in the intermediate- to long-term, leaders will likely take this opportunity to reinvent their properties while simultaneously looking to decarbonize their real estate portfolios.[68] Fortunately, smart digitized workplaces containing air filters, sensors (measuring temperature, occupancy, air quality and GHG emissions), and touch-free entrances, can also be used to support measuring and reporting of climate impacts.

In the long run, the CRE market players will have to reimagine their spaces and integrate health and safety and agility into every aspect of their properties, with a renewed focus on standards that emphasize air quality and healthier environments, and new concepts for office design such as the six feet office[69] that provide employees with more space and clear guidance on movement through the space. The need for hygiene will charge new trends and technologies such as UV lighting systems to disinfect spaces after use (similar to hospital systems), and integrating voice technology and automation to prevent unnecessary touching of surfaces in shared spaces such as elevators. Despite these changes, remote work is likely here to stay in one form or another.

With much of the CRE space sitting empty through the pandemic, building owners and managers have resorted to repurposing space for other uses. In Montreal, the owner of a co-working space and café listened to what people in the neighbourhood wanted, and converted the space into a market, giving the community a new place to buy local produce and grab a coffee.[70]

Before the pandemic, there was already a shift happening to modern and energy efficient Class A buildings. Older Class B and C buildings may not be worth retrofitting to meet new standards of air filtration and space, but they might be good candidates for conversion to residential. This is already happening in cities such as Calgary and Edmonton that were experiencing economic slowdowns pre-pandemic. According to Steven Paynter of Gensler architecture and design, the high ceilings typical of commercial buildings allow for relatively easy addition of plumbing and ducts required for residential units.[71]

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[67] See: https://www.spglobal.com/ratings/en/research/articles/200709-student-housing-in-the-covid-19-pandemic-era-school-s-out-but-for-how-long-11566259

[68] See: https://www.weforum.org/agenda/2020/06/what-effect-has-covid-19-had-on-the-real-estate-sector/

[69] See: https://www.cushmanwakefield.com/en/netherlands/six-feet-office

[70] See: https://www.cbc.ca/news/canada/montreal/office-space-empty-pandemic-covid-1.5679078

[71] See: https://www.theglobeandmail.com/business/industry-news/property-report/article-future-proofing-upgrade-fading-offices-or-convert-them-to-residential/

Repurposing office buildings to residential can save 50 per cent compared with building new, and the process also avoids tonnes of demolition material that would otherwise be created. Considerations for a building conversion to residential include the following:

- Context of heritage value and a surrounding mixed-use neighbourhood
- Usable form of the building shape and size
- Location and proximity to other high-rise buildings
- Windows on at least three sides and preferably south-facing
- Floor area of 750 square meters and 2.75m ceilings
- Ease of upgrading electrical and plumbing systems

While the demand for many types of CRE has declined (e.g., office, hospitality), warehousing is experiencing growth. A PwC report on emerging trends in real estate highlights logistics, warehousing, and fulfillment as the clear winners coming through the pandemic. [72] This is a result of both longer term trends in the rise of e-commerce, and also supply chain disruptions and the need to create a more resilient inventory. With the growth of warehousing in urban areas, support will be key for last-mile delivery solutions.

Residential Real Estate

Many Canadian cities, particularly Toronto, Vancouver, and Victoria, face a severe housing affordability issue.[73] As early as the first quarter of 2020, the value of residential properties in Montreal, Ottawa, Toronto, Calgary, Vancouver, and Victoria increased by 4.4% year over year. Prices rose the most for the new (+9.2%) and resale (+5.5%) condominiums, with resale houses seeing a smaller increase in price (+4.6%), and prices for new houses decreasing (-0.2%).[74] It was expected that the economic fallout resulting from the COVID-19 pandemic would result in the housing market cooling off; however, data released by the Canadian Real Estate Association in September 2020, shows that this was not the case. During this time, national home sales rose 0.9% on a month-over-month basis in September, and actual (not seasonally adjusted) activity was up 45.6% year-over-year.[75] There are many reasons for the increase, including pent-up demand from the lockdown and very-low interest rates, but it is also important to note that low-income workers were the most directly impacted by job losses in this pandemic, limiting the effect on real estate sales demand.

The trends are different when it comes to the rental market. In the month of September, many municipalities such as Toronto (-14.1%), North York (-14%), Saskatoon (-8.6%), Mississauga (-5.8%), Vancouver (-1.6%), and Ottawa (-0.4%) witnessed a decrease in rental rates, while Montreal (+17.2%) and Kitchener (+11.5%) proved to be an exception to this trend. [76]

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[72] See: https://www.pwc.com/ca/en/industries/real-estate/emerging-trends-in-real-estate-2021.html
[73] See: https://thoughtleadership.rbc.com/pandemic-distorts-canadas-housing-affordability-picture/
[74] See: https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00053-eng.htm
[75] See: https://creastats.crea.ca/en-CA/
[76] See: https://rentals.ca/national-rent-report

4.4.2 Transit, Mobility and Commuting

The COVID-19 pandemic is delivering marked impact on urban mobility in the wake of measures to contain the outbreak and the pivot of businesses to remote work. While transit stakeholders grapple with uncertainty, the shift in commuting and travel behaviour introduces an opportunity to reshape urban mobility models and planning in favour of GHG emission reductions.

The pandemic is driving a significant shift in Canadians' urban mobility needs and commuting patterns.[77] While not uniform across cities, the transition to remote work is set to impact commuting patterns for the foreseeable future, and will likely continue to be an operating model in certain sectors.[78]

Prior to the outbreak, new forms of shared and connected mobility were already gaining momentum, offering convenient, cleaner commuting alternatives. However, the pandemic and associated telecommuting, as well as consumer shifts around spending,[79] social distancing, and cleanliness have led to a sharp drop in revenue for public transit and ride-sharing organizations alike. The abrupt decline in public transit ridership in Canada resulted in an historic year-over-year passenger decrease in April 2020, with the number of passenger trips falling 85%.[80] Ride-sharing firms Uber and Lyft reported 75% to 80% drops in gross bookings.[81] The micro mobility industry also faces devastating declines in ridership and revenue just as the industry was accelerating.

A sound public transit system, cycling infrastructure, pedestrian space, and new and shared forms of mobility are not only low-carbon and healthy solutions, but are vital to the economic recovery of Canadian cities, and enable of economic and social inclusion. Mobility providers will need to pivot by innovating, collaborating, and remaining agile, and related capital projects must be adequately evaluated to consider the risk of reduced revenue and balance desire to restore on-demand ridership with appropriate distancing measures. If strict disinfection protocols are enforced, it is expected that transit ridership will rebound somewhat.[82] Addressing public health concerns and restoring consumer confidence in sustainable commuting will remain paramount in transit operating plans, including determining vehicle passenger densities, adjusting passenger flow, and introducing touchless systems. Mobility operators will need to improve their ability to forecast demand and adjust route planning and staffing accordingly – particularly if peak demand continues to fluctuate. There are also grounds to re-examine fare structures, improve off-peak travel, and make transit competitive with other options.

In parallel, cities have made notable efforts to support alternative commuting modes and micro mobility, including funding for designated bike and scooter lanes, car-share parking, and expanded sidewalks. Lockdown regulations helped drive citywide policies promoting bicycle use around the world. Milan, for

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[77] See: https://rates.ca/resources/survey-28-canadians-will-work-home-after-covid-19-lockdown-lifts
[78] See: https://www.newswire.ca/news-releases/a-quarter-fewer-canadians-will-commute-to-work-after-the-covid-19-lockdown-lifts-new-survey-880013822.htm
[79] See: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-impact-of-covid-19-on-future-mobility-solutions
[80] Statistics Canada 2020; See: https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00069-eng.htm
[81] See: https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/public-sector/ca-urban-mobilitys-routes-to-recovery-en-aoda.pdf
[82] See: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-impact-of-covid-19-on-future-mobility-solutions

example, announced that 35 kilometers of streets would be transitioned to pedestrian and cycling lanes. Seattle closed 30 kilometers to most vehicles in favour of walking and biking. Paris will convert 50 kilometers of roads to bicycle lanes while investing USD $325 million to update the city's bicycle network.[83] Los Angeles and Houston have also seen a 100% increase in cycling since the outbreak. These cities are part of a "slow street" program that restricts vehicle access and provides space for pedestrians and cyclists.[84]

Additional governance and planning strategies include supporting flexible ownership models (e.g., for e-scooters), electric or hybrid vehicles, and companies focusing on shared scooters and bikes. Cities may reduce permit fees to encourage micro mobility over private car ownership, and industry consolidation could allow scale-efficiency improvements.[85] There is also a need to address concerns over the lack of investment in innovative technologies such as driverless vehicles that support social distancing. Forward-thinking cities will take strides to align with new-mobility services to offer cooperative arrangements such as multimodal access, integrating public transit with other mobility options.[86] In this manner, the COVID-19 pandemic could accelerate the clean economy transition while delivering the mobility services a post-pandemic world will demand.

The increase in remote work has the potential to re-shape patterns of land use and neighbourhood services, and subsequently how transit services are planned to accommodate the shift. Without the need to commute into the city centre every day, remote workers are relying more on public spaces and amenities within walking distance of their homes. An increased importance on goods and services in neighbourhoods signals a need to accelerate the development of small urban villages and mixed-use, mid-rise developments around transit corridors and nodes.[87] [88]

[83] See: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-of-micromobility-ridership-and-revenue-after-a-crisis
[84] See: https://www.bloomberg.com/news/articles/2020-09-23/how-the-coronavirus-affected-biking-in-u-s-cities
[85] See: https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-of-micromobility-ridership-and-revenue-after-a-crisis
[86] See: https://www.bcg.com/en-ca/publications/2020/how-covid-19-will-shape-urban-mobility
[87] See: https://www.ctvnews.ca/health/coronavirus/new-normal-15-ways-cities-can-emerge-better-than-ever-after-covid-19-1.5123283
[88] See: https://policyoptions.irpp.org/magazines/june-2020/density-can-work-post-covid-19-with-good-urban-planning/

Case Study: Montréal's Safe Active Transport Circuit

Integral to Montréal's COVID-19 strategy, the city has ambitiously reconfigured public spaces and created safe active transportation circuits that allow residents to walk and bike to parks and main thoroughfares while complying with distancing directives. Since early June, over 350 kilometres of dedicated pedestrian lanes and bike paths have been developed based on a network running predominantly along commercial routes. Although originally planned as a temporary measure for summer and fall, there are discussions being had around making the active network permanent.

Case Study: Los Angeles' Free Transit Option

To restore public transit ridership to pre-pandemic levels, Los Angeles County Metropolitan Transportation Authority is considering eliminating bus and rail fares. L.A. Metro announced a new internal task force to study a fare-free system as a measure to meet rider needs during these unprecedented times. While passenger payments represent a small share of the agency's budget, there are concerns that service cuts may follow, and that managing sanitation and safety could become problematic.. The task force will deliver its findings by the end of 2020 after reviewing issues such as funding alternatives, budget implications, and impacts on smaller transit operators.

Source: https://www.masstransitmag.com/management/press-release/21152206/los-angeles-county-metropolitan-transportation-authority-metro-la-metro-to-study-and-consider-eliminating-bus-and-rail-fares

4.4.3 Small Businesses and City Centres

The shift in terms of where and how people work has impacted municipal revenues linked to both business and property taxes. For local governments, the exodus of office workers from commercial spaces into their homes or more distributed, smaller office workspaces may result in a decrease in business tax revenues and, thus, a need for governments to raise revenues from other sources to maintain their current service levels.[89] For small businesses and companies, the shift of office workers from city centers means a steep reduction in revenues which, coupled with high business costs (such as rent), may result in many businesses becoming insolvent.

Small businesses are integral to the Canadian economy, representing 42% of GDP and 48% of new jobs.[90] The pandemic has had a significant impact on the future outlook for many, with over 81% of Canadian business owners saying they have been negatively impacted and 32% unsure about the viability of their business over the next year.[91] Women and youth are over-represented in small business employment, and without a strong small business recovery, income inequality for the most vulnerable demographics will only become more severe.[92]

As a result, the federal government launched a variety of interest-free loans, wage subsidies, and rent assistance programs to support small businesses and workers early in the pandemic, but a number of trends have emerged to further complicate business models, including increased digital delivery, domestic procurement, consumer caution, and less market concentration.[93]

Business districts

Business districts, in particular, are home to millions of workers from around the world and play an integral role in defining the character of a city. They attract talent, capital, and new businesses, and as the center of commercial activity in a city, are a vital source of tax revenue for local governments. They are no longer judged solely on their economic potential; rather more and more people are interested in the social and well-being offerings of these urban cores.[94]

However, with COVID-19 locking down the economy and instilling a fear of urban density, the future of the downtown business district will require innovation and adaptation to survive. For small businesses located in business districts and city centres, the exodus of office workers has led to a steep reduction in revenues. Accommodation and food service, non-essential retail, and arts and entertainment businesses are exceptionally vulnerable to the impact of COVID-19. Given that remote work is here to stay in one form or another, and the tourism sector will not see revenues returning to 2019 levels until 2024, the small business sector faces a daunting future. [95]

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[89] See: https://thoughtleadership.rbc.com/canadian-city-finances-ailing-from-covid-19/
[90] See: https://thoughtleadership.rbc.com/five-ways-to-help-small-business/
[91] See: http://cibc.mediaroom.com/2020-05-04-COVID-19-impact-felt-by-81-per-cent-of-Canadian-small-business-owners-CIBC-Poll
[92] See: https://thoughtleadership.rbc.com/five-ways-to-help-small-business/
[93] [93]See: http://cibc.mediaroom.com/2020-05-04-COVID-19-impact-felt-by-81-per-cent-of-Canadian-small-business-owners-CIBC-Poll
[94] See: https://www.ey.com/en_gl/real-estate-hospitality-construction/is-this-the-end-of-the-central-business-district

Local governments have an important role to play to ensure business districts not only survive this pandemic, but also thrive to support the recovery of the overall economy.

Businesses such as cafes and restaurants play an essential role in defining the social life of a business district and are essential for attracting and retaining talent. Many local governments have already taken critical steps to lower or defer taxes, provide advice on integrating health and safety, and improve access to financial help, and will need to work with other orders of government to continue to do so.

Many smaller brick-and-mortar businesses are also struggling with the transition to digital-first services, and cities across the country have launched programs to share tools and help develop solutions.

For example, the City of Toronto announced an expansion of the Digital Main Street program to help businesses in Toronto and across Ontario embrace technology in response to the COVID-19 pandemic.[96] The program includes initiatives that offer individual main street businesses a customized business transformation plan and implementation support at no cost, bring technology companies and communities together to fund pilots that improve local businesses, and work with the innovation community to create solutions that will help future proof main street.

The City of Vancouver compiled resources related to re-opening plans and protocols, operating guidelines, and city initiatives, and launched a small business guide to provide guidance across all stages of business development to small business owners.[97]

Mobility is a key component of a downtown business district, and many local governments took immediate steps to improve their pedestrian and cycling infrastructure at the start of the pandemic. Many cities grapple with maintaining hygiene, good air quality, and green spaces in urban centers, and this pandemic has re-emphasized the importance of health and well-being for many downtown residents who may now be apprehensive. Milan's adaptation strategy details comprehensive actions to reduce travel demand, improve and diversify mobility options (e.g., promoting bicycles, electric scooters, shared vehicles), increase public transport, clear sidewalks, integrate public transport with other mobility systems, enhance automation of transport and parking tickets and passes, and invest in short-term parking spaces. In addition to this, Milan also plans to have open squares in every neighbourhood to reclaim public spaces for wellbeing, leisure, and sports.[98]

An especially relevant concern for several Canadian cities' downtowns is housing affordability. In the current condition of widespread economic duress, the local government must ensure that workers continue to live nearby. To ensure that business districts retain workers, it will be vital for local governments to develop long-term action plans to address these concerns and ensure districts remain healthy and welcoming.

Many local business and regional associations have worked closely with cities on economic recovery strategies in these same areas, developing principles and strategies to support long-term growth with a

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[96] See: https://www.toronto.ca/news/city-of-toronto-further-expands-digital-main-street-program-to-help-local-businesses-during-the-covid-19-pandemic/
[97] See: https://vancouver.ca/doing-business/covid-19-coronavirus-support-for-local-businesses.aspx
[98] See: https://www.theguardian.com/world/2020/apr/21/milan-seeks-to-prevent-post-crisis-return-of-traffic-pollution

focus on improved mobility, affordable housing strategies, accessible broadband networks, and greater coordination across regions.

Case Study: Activating Space Field Guide

Two professors with the University of Alberta have released the <u>Activating Space Field Guide</u>, written for individuals and community groups to provide them with tools to turn ideas on reusing or repurposing unused space into ones that can bring workers back to the city and enrich lives of community members. The project, funded by the Social Sciences and Humanity Council of Canada and University of Alberta's Kule Institute for Advanced Study, is particularly timely given the spike in empty commercial spaces across Canadian cities and the need for cities to get creative on how the spaces can continue to create revenue and serve a purpose that improves the livelihoods of residents.

The Guide focuses on the relationships, resiliency, and innovation that emerges as empty, unused spaces are activated based on the needs and values of neighbourhoods and communities. As the pandemic continues, this type of resilience and innovation across urban space will become fundamental to the economic re-start, as well as mental and physical well-being of residents adhering to social distancing guidelines.

Case Study: San Francisco's economic recovery

The City of San Francisco put together an Economic Recovery Task Force (ERTF) to guide the City's efforts through the COVID-19 recovery to sustain and revive local businesses and employment, mitigate the economic hardships already affecting the most vulnerable residents, and build a resilient and equitable future. The Task Force developed 41 policy recommendations that represent the best thinking of this diverse group, informed by the experience of Task Force members, research from city staff, as well as input from communities across San Francisco through surveys and focus groups (The city and county of San Francisco, 2020).

In the short term, the taskforce supported many of the city's immediate initiatives such as the Shared Space program, significantly increasing outdoor eating capacity, waiving outdoor business permit fees, deferring business registration fees and unified license fees, and approving a Just Add Music (JAM) permit to enable live outdoor music and entertainment in existing shared spaces.

4.4.4   ICT Networks and Bandwidth

Building and maintaining adequate ICT networks and reliable bandwidth have long been an important part of cities' and regions' economic development strategies, and is critical for attracting new businesses and diversifying local economies in the digital age.

Many of the smart city technologies and digital tools implemented pre-pandemic rely on fast and reliable ICT networks, a demand that has only increased during the pandemic with the need for remote work and video conferencing.

Changes in Response to COVID-19

As the current pandemic has shown, reliable ICT networks are a critical piece of cities' response mechanisms in a state of emergency. Broadband access allows public health professionals and other support services to continue their important work remotely and coordinate their emergency response efforts throughout disruptions such as this global pandemic. The importance of this function of ICT was recently highlighted in a report on emergency governance challenges and innovations by cities and regions, as part of the joint Emergency Governance Initiative led by United Cities and Local Governments, Metropolis, and the London School of Economics.[99]

An April 2020 poll run by Shaw and Abacus Data found that the home internet service of 90% of Canadians handled the increased demand well and 1 in 5 Canadians said they had upgraded their internet service during the pandemic.[100] Between working from home and more screen time in the evening, ICT networks are playing an increasingly important role in Canadians' lives.

Shaw Communications conducted a study into how network traffic changed in 2020[101] and found that internet usage on their wireline network increased by as much as 50% overall since physical distancing measures were put in place, and peak usage periods climbed to twelve hours a day, every day of the week, instead of the usual three or four hours in the evening. Peak daily download traffic increased by 26% above pre-pandemic levels on Shaw's network in March – a sustained increase in traffic that would normally occur over the course of a full year of network growth – while upload traffic shot up 52% above normal levels and created never before seen twelve-hour peak traffic period, from 9 a.m. to 9 p.m.

To facilitate remote work by federal public servants in the initial stages of the pandemic, Shared Services Canada increased network capacity, developed best practice guidance, and prioritized network access to sustain service continuity.[102] There is an opportunity to extend this model and support remote workers at other levels of government across the country, as well as the remote workforce outside of the public service.

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[99] See: https://www.metropolis.org/sites/default/files/resources/AN02_Final%20for%20publication.pdf
[100] See: https://abacusdata.ca/home-internet-connection-canadians-pandemic-online-streaming/
[101] Stats taken from a sponsored article in the Walrus: https://thewalrus.ca/covid-19-didnt-break-the-internet-it-brought-the-future-to-our-doorstep/
[102] See: https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/UNDESA%20Compendium%20of%20Digital%20Government%20Initiatives%20in%20Response%20to%20the%20COVID-19%20Pandemic.pdf

In May 2020, the federal government fast-tracked its high-speed broadband access plan in an effort to speed up the implementation of the $1.7 billion Universal Broadband Fund.[103] This action is meant to mitigate the potential risk of remote work transitions leaving many Canadians behind; data from the Canadian Radio-television and Telecommunications Commission (CRTC) suggests that only about 40% of rural residents in Canada currently have access to high-speed broadband.[104]

In the September 2020 Speech from the Throne, the federal government announced a number of related commitments, which were welcomed by stakeholders such as the Information Technology Association of Canada.[105] These commitments include:

- Investments in IT systems to modernize government services;
- Increasing diversity and modernization in procurement processes;
- A rural broadband strategy and increased support for the Universal Broadband Fund mentioned above; and
- A commitment to supporting the growth of small and medium-sized homegrown enterprises.

For organizations that were already undergoing a digital transformation, the pandemic accelerated existing technology plans in a manageable way. But for organizations that were slow to adopt digital tools and enable remote work by employees, the pandemic highlighted vulnerabilities and issues related to privacy, networks, and security. According to shared workspace provider Regus, the speed at which organizations have had to adapt could result in missteps in developing lasting and effective remote work policies.[106] By building technology capacity and shifting to digital platforms now, organizations will both mitigate the current impacts and build a more resilient operation in the future.[107] [108]

5   NEXT STEPS

A lot has changed in cities since the start of the pandemic, and all orders of government need to work together to ensure the principles for sustainable, inclusive and resilient cities are at the heart of city-building post-pandemic.

This Framing Report will be used as a foundation for the upcoming series of Urban Project roundtables, and inform the content of the discussions.

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[103] See: https://www.cbc.ca/news/politics/broadband-internet-covid-1.5552261
[104] See: https://crtc.gc.ca/eng/internet/internet.htm
[105] See: https://itac.ca/blog/tech-industry-commends-government-for-commitments-to-generational-it-investments-procurement-modernization-and-universal-broadband-in-speech-from-the-throne/
[106] See: https://www.regus.ca/work-canada/what-will-the-long-term-effect-of-covid-19-be-on-digital-transformation/
[107] See: https://www.gartner.com/smarterwithgartner/coronavirus-cio-areas-of-focus-during-the-covid-19-outbreak/
[108] See: https://www.gartner.com/smarterwithgartner/cio-agenda-2021-prepare-for-increased-digital-innovation/