



UNIVERSITY OF
TORONTO



MAKING UP FOR LOST TIME: STRATEGIC INFRASTRUCTURE DEVELOPMENT FOR GROWTH AND RESILIENCE

**Kathryn Exon Smith, Karen Chapple,
Drew Fagan, Matti Siemiatycki**

Preliminary publication (December 4, 2024)



This article is a chapter from the School of Cities report
Canada's Urban Infrastructure Deficit: Toward democracy and equitable prosperity

ABSTRACT

Canada has an infrastructure deficit that limits our ability to interact, compete, and thrive in a changing world. Inadequate roads, transit, schools, and other civic institutions threaten the country's economic capacity and the kind of connected communities that are central to an equitable and enduring democracy. This introductory chapter discusses the evolution of Canadian infrastructure policy since the Second World War, outlines the critical role of infrastructure in economic productivity and innovation, and explores how civic infrastructure facilitates interaction across different income and ethnic groups. After a review of international best practices in infrastructure planning, we suggest an agenda for future research and action that encourages long-range, evidence-based investments by all orders of government to build the Canada of the future.

AUTHOR BIOGRAPHIES

Kathryn Exon Smith is a senior research officer at the School of Cities, University of Toronto, where she focuses on research and partnership engagement in infrastructure, transit-oriented communities, and equitable development. She has worked with a variety of organizations in Canada and the United States in urban planning policy, curriculum design, and non-profit leadership and governance, helping to bridge the gap between research and practice. Kathryn holds a BA and MA in History from the University of Toronto, and a Master of City Planning from the University of California, Berkeley, where her research centred on transportation, infrastructure, and economic development.

Karen Chapple, PhD, is the director of the School of Cities and professor in the Department of Geography & Planning at the University of Toronto, and also professor emerita of City and Regional Planning at the University of California, Berkeley. She studies inequalities in the planning, development, and governance of regions in the Americas, with a focus on economic development and housing. In 2023 she received the Sir Peter Hall Award for Lifetime Contribution to the Field from the Regional Studies Association. Karen holds degrees in urban studies and city planning from Columbia University, Pratt Institute, and UC Berkeley.

Drew Fagan is a professor at the Munk School of Global Affairs & Public Policy, University of Toronto, where he teaches in graduate degree programs and leads other initiatives. He is also a senior advisor at McMillan Vantage Policy Group, a national public affairs firm, and sits on the board of directors of numerous public institutions. He previously spent 12 years in leadership positions with the governments of Ontario and Canada, including as Deputy Minister of Infrastructure for Ontario. He holds a Bachelor of Commerce degree from Queen's University and a Master of Arts degree from Western University.

Matti Siemiatycki is the director of the Infrastructure Institute at the School of Cities, University of Toronto, and professor in the Department of Geography & Planning. His work focuses on delivering large-scale infrastructure projects, evidence-based infrastructure investment decisions, and the effective integration of infrastructure into the fabric of cities. His recent studies explore transit policy decisions, the value for money of public-private partnerships, the development of innovative mixed-use buildings as a form of place-based infrastructure policy, and the diversity gap in the infrastructure industry workforce. He earned a PhD in Community and Regional Planning from the University of British Columbia.

INTRODUCTION: MAKING INFRASTRUCTURE BETTER

Is something amiss in Canada? Long lauded for the quality of its public realm, the livability of its cities, and the civility of its discourse, Canada now seems to be in decline. Transit services, highways, and bridges are deteriorating, while the impacts of climate change stretch systems to the limit. The community institutions that provide services and opportunity for immigrants, youth, the elderly, and the general public are underfunded. A severe housing shortage affects both middle-class and lower-income residents, due in part to the shift in the 1980s of responsibility for providing affordable housing from the public to the private sector. Coping with this unreliable physical and social infrastructure, Canadians are losing faith in public institutions and are significantly less optimistic about the country than they were a decade ago.¹

In the past, we built infrastructure to match our ambitions. This included a transnational railway and the St. Lawrence Seaway, which knitted together a nascent country; the infrastructure and housing that supported a rapidly growing population after the Second World War; and the national high-speed internet network that enables world-class research and development today. We also learned the hard lesson that infrastructure connects but also divides: the railway displaced Indigenous peoples, while highway construction and urban renewal projects disrupted historically Black communities in cities like Halifax and Vancouver. And today, despite huge investment, Canada struggles with a persistent digital divide that risks excluding rural and northern communities from the 21st-century economy.

Today's ambitions – to increase our standard of living and ensure it is equitably distributed, to confront climate change, and to welcome immigrants – are no less grand. But they are not matched by the infrastructure we have or the plans we make. There is a gap between our reality and our aspirations, from urban transit and transportation networks, to community parks and social services to energy, internet, and clean drinking water in rural and remote regions.

The infrastructure deficit creates a challenge for Canada just as we are trying to, in the words of Ed Greenspon, Janice Stein, and Drew Fagan, “matter more.”² Mattering more – domestically and internationally – is critical for our future, and it means deepening our economic capacity and accelerating our ability to get things done. This will only happen if our cities and communities are equipped with the infrastructure needed to interact, compete, and thrive. Furthermore, strong and connected communities are central to an enduring democracy.

¹ Ipsos, “Public Opinion in Canada.”

² Greenspon, Stein, and Fagan, “Opinion: Canada Needs to Have a Plan.”

These challenges are multifaceted and are made more complex by the nature of infrastructure itself. Much infrastructure is invisible to the public – at least until it breaks. It is not just that systems like sewers and water are literally underground, but also that the public tends to focus on facilities like schools, care homes, and even transit only when they are directly relevant to their current stage of life. Moreover, infrastructure investments are deeply political, and tend to attract little attention outside of election cycles.

Underlying the infrastructure challenges we face are four key questions, each with a different perspective:

- **Governance:** What is the correct balance of money and responsibilities among the municipal, provincial, and federal governments and among the public, private, and nonprofit sectors? Additionally, what is the correct balance between good policy and good politics in decision-making?
- **Location:** How can we most efficiently and equitably meet the demands of diverse population segments in a vast and varied land?
- **Finance:** How do we optimally pay for infrastructure upkeep and expansion, such as through taxes, user fees, or both?
- **Time:** How do we reorient from the current ad hoc approach to align better with present and future needs and a changing climate?

Canada’s population is overwhelmingly urbanized, and by international measures, Canada continues to have among the most livable cities in the world. Nevertheless, infrastructure is frequently an area in which Canadian cities score worse than their peers, reflecting a decline that affects residents’ quality of life.³ Coast to coast to coast, the costs of aging and underdeveloped infrastructure are in the public consciousness, particularly against the backdrop of climate change. Both Calgary and Montreal experienced major water main breaks in 2024, leaving large urban populations without drinking water – literally bringing home the conditions that Indigenous communities have lived with for decades. Toronto and Mississauga each saw a major flood from heavy rains that overwhelmed storm sewers, blocked roadways, and caused hundreds of millions of dollars in damage to homes and businesses. In Yellowknife, the evacuees fleeing the 2023 wildfire faced the compounding challenges of traffic and dangerous conditions on the only road out of the city.

If we do not act now, we risk weakening the country domestically and making Canada matter *less* to the rest of the globe – economically, politically, and socially. But if we scale our actions to our ambitions through intelligent investments, we can continue to build a prosperous and fair-minded country with global impact.

³ Economist, “The World’s Most Liveable Cities in 2024”; Schwab, “Global Competitiveness Report 2019.”

In this introductory chapter, we will therefore make the case for addressing the infrastructure deficit. We begin by defining the existing deficit and explaining how we got to this point. We then examine the nature and extent of our infrastructure needs, and consider how we can best move forward to support competitiveness, resilient communities, and democracy itself. After a review of international best practices in infrastructure assessment, governance, and finance, we lay out a research agenda that supports infrastructure planning for an uncertain future.

*“The infrastructure deficit creates a challenge for Canada just as we are trying to, **in the words of Ed Greenspon, Janice Stein, and Drew Fagan, ‘matter more.’**”*

DEFINING THE INFRASTRUCTURE DEFICIT

The gap between the way we live and the way we could live is partially a gap between the infrastructure we have and what we need to support a modern and growing nation of more than 40 million people. Estimates of the infrastructure deficit vary widely, with most between \$110 and \$270 billion.⁴ This deficit includes physical and social infrastructure, both private and public, and varies by province/territory and by city. It is also likely an underestimate.⁵ The full extent of the gap is unknown, because Canada is one of the few major developed countries that does not have a national infrastructure plan or an agency whose mandate is to evaluate and prioritize infrastructure investment. Different orders of government track their own assets with different data standards and varying levels of transparency. There is no central data repository, nor is there independent infrastructure planning, which is standard practice in countries like Australia, New Zealand, and the United Kingdom.

By some measures, we have made progress in the past decade. In 2018, Statistics Canada began tracking infrastructure assets, investment, and economic impact for the public and private sectors via its Infrastructure Statistics Hub, as part of a federal initiative to take a more evidence-based approach to large investments.⁶ By these metrics, the average age of Canada's infrastructure has decreased by almost three years since 2005, and the total value of Canada's infrastructure assets has more than tripled, to \$1.2 trillion.⁷ Yet these figures do not cover all infrastructure types, nor do they provide enough granularity to assist in decision-making. They also fail to take into account the need to modernize and green existing infrastructure as new technology becomes available. It remains unclear, even to experts, whether the infrastructure deficit is increasing or decreasing.

Without a clear sense of the current state of all of Canada's infrastructure, it is difficult to understand the specific ways we are falling short: in the condition of our existing assets? in our ability to meet current or future demand? in knowing where there are the greatest differences in access across the country? How can we determine how safe our infrastructure is to operate and maintain, or how resilient it is to a changing climate and more extreme weather events?

A commitment to more funding is not sufficient on its own. To be sure, Canada has introduced new means of infrastructure development, such as the Canada Infrastructure Bank (CIB), which invests public funds alongside private ones to encourage more innovative renewal and expansion. Canada has also been a leader in public-private partnerships (P3s) in more traditional infrastructure development.

⁴ For context, the federal infrastructure budget is just over \$8 billion in 2024, though is expected to ramp up over the next several years. Provincial/territorial and municipal spending also add to this figure. See Department of Finance Canada, "Safer, Healthier Communities."

⁵ A recent Statistics Canada report estimates that replacing only the road and water systems in "poor" or "very poor" condition would cost north of \$350 billion. This does not include transit systems, buildings, pipelines, or a host of other infrastructure types. See Major, "Replacing Canada's Crumbling Water, Road Infrastructure"; Statistics Canada, "Canada's Core Public Infrastructure Survey."

⁶ Housing, Infrastructure and Communities Canada, "Government of Canada Launches Data Hub."

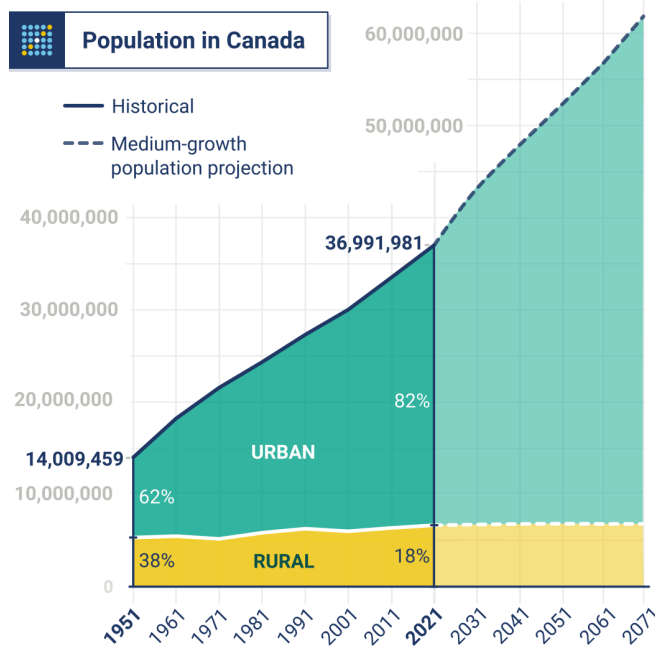
⁷ Statistics Canada, "Stock."

Both the CIB and P3s are currently facing some degree of re-evaluation, which is healthy, but what Canada needs most is more and better planning, not less. This includes ensuring that the hundreds of billions of dollars budgeted toward infrastructure over the next decade are spent to the best effect, in terms of both construction and operation.

HOW WE GOT HERE

Canada entered a phase of nation-building following the Second World War, with spending on public works peaking at around 3% of GDP in the late 1950s.⁸ This era gave rise to many significant infrastructure projects, including the first underground transit networks in Toronto and Montreal; major hydroelectric-generating stations and dams; the Trans-Canada Highway; a wave of new schools, colleges and universities; and numerous museums, galleries, and recreation centres nationwide. This construction coincided with an increase in the proportion of Canadians living in urban areas (see Figure 1), and a high rate of immigration. The ubiquitous facilities built in communities big and small to mark Canada’s centennial in 1967 are a lasting legacy from this era. Indeed, it is no exaggeration to say that modern Canada was built in this period.

Figure 1. Historical and projected population growth in urban and rural areas in Canada, 1951-2071



Data Sources: Statistics Canada

represent only a small share of Canada’s overall infrastructure. Provincial investment generally did not even keep pace with the cost of maintaining what the provinces had already built, leaving a legacy of underfunding and disrepair. Overall capital investment in this period was roughly half that of the 1950s.¹⁰ Cities, meanwhile, struggled with operating and maintenance costs, especially after an era of “downloading” from the federal government and the provinces in the 1990s. In some cities, the level of municipal debt soared. Some provinces responded with “growth plans” meant to better plan for

But federal and provincial governments pulled back from infrastructure investment after the mid-1970s amid growing government debt and a growing belief in the benefits of privatization, especially in key sectors such as freight rail, energy, and airlines. The private sector picked up some of the slack but, unsurprisingly, focused on profit-making investments, with little regard for issues of social equity. In the case of the railways, for instance, private freight companies now own the majority of the tracks in the country’s busiest travel corridor (which includes Toronto, Ottawa, and Montreal), leading to deteriorating passenger rail service as freight trains are given priority.⁹

Federal investments in the last decades of the twentieth century were sufficient to offset depreciation of existing federal assets, but these represent only a small share of Canada’s overall infrastructure. Provincial investment generally did not even keep pace with the cost of maintaining what the provinces had already built, leaving a legacy of underfunding and disrepair. Overall capital investment in this period was roughly half that of the 1950s.¹⁰ Cities, meanwhile, struggled with operating and maintenance costs, especially after an era of “downloading” from the federal government and the provinces in the 1990s. In some cities, the level of municipal debt soared. Some provinces responded with “growth plans” meant to better plan for

⁸ Wood, “To Fix Canada’s Infrastructure”; Mackenzie, “Canada’s Infrastructure Gap.”

⁹ Transport Canada, “Ongoing Efforts for High Frequency Rail.”

¹⁰ Mackenzie, “Canada’s Infrastructure Gap.”

development in major cities, and the federal government lent a hand by funding some major urban land development projects, including the Vancouver airport and the Toronto waterfront.¹¹

It was not until the early 2000s that Canadian governments began to reverse this downward trajectory, through measures like the federal Gas Tax Fund (known since 2021 as the Canada Community Building Fund) – a predictable, permanent, and flexible source of funding that flows through provinces and territories to municipalities for infrastructure of various types, including roads, bridges, transit, water, and cultural facilities. The recession of 2007–2009 prompted governments globally to ramp up infrastructure spending as a way of jump-starting economic recovery.¹² In Canada, these stimulus funds supplemented existing efforts from both the federal government and the provinces to raise capital spending over the longer term. Infrastructure funding grew significantly while Stephen Harper was prime minister (2006–2015) and has grown significantly again since he was succeeded by Justin Trudeau. Under the latter, the government has focused on urban development, especially transit – and, more recently, housing, given the political uproar about inadequate construction and high prices.¹³ This upward spending trend has also occurred in provinces across the country, indicating a commitment to infrastructure that goes beyond partisan lines as a response to the low spending levels of previous eras.

However, the responsibility for building and maintaining most public infrastructure falls on municipalities, which have the fewest sources of revenue to do so. Canada has become one of the most decentralized infrastructure planning environments in the world.¹⁴ In 1955, local governments owned just over 20% of Canada’s infrastructure; today, that figure is over half.¹⁵ City budgets, lean at the best of times, are stretched to the breaking point, relying on property taxes and user fees to keep systems running. Most of the municipal infrastructure we depend on is over 20 years old and requires significant maintenance. Roads, bridges, and public transit in particular need attention, with a high percentage rated as being in “fair” or worse condition by a collective of civil engineers in 2019 (see Figure 2).¹⁶ Hospitals and schools, both provincial responsibilities, also need urgent attention and reinvestment, in terms of both their physical state of repair and of sufficient staffing of nurses and teachers.

These assessments of condition apply only to infrastructure elements for which the information is available; for many critical assets, including public transit, sewer pipes, and stormwater management facilities, the condition is often unknown. Without better tracking and prioritization, including through more integrated planning, spending will remain too ad hoc and diffuse.

¹¹ Spicer, “The Rise and Fall of The Ministry of State For Urban Affairs.”

¹² Stoney and Krawchenko, “Transparency and Accountability in Infrastructure Stimulus Spending.”

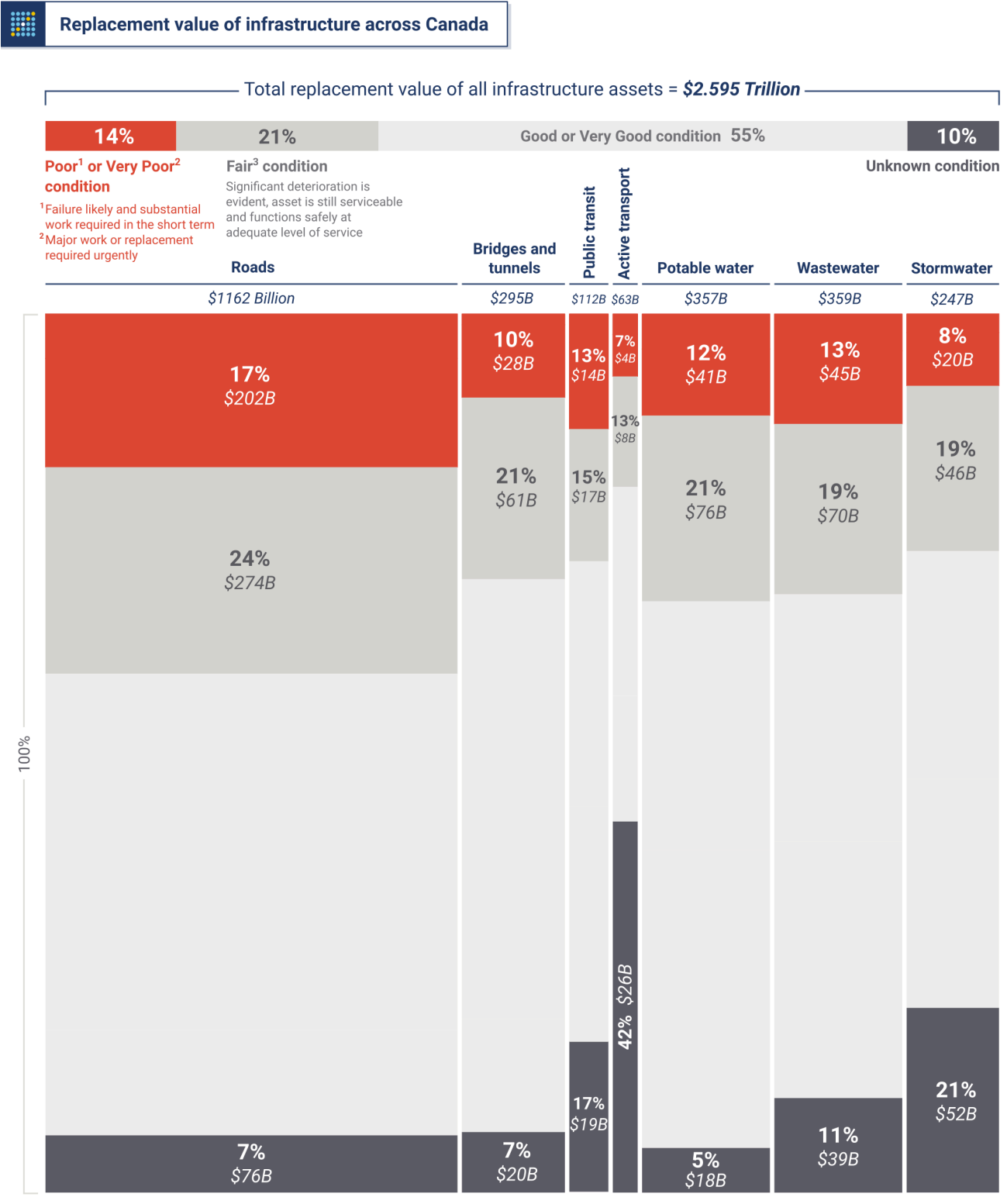
¹³ Sohi, “What Will It Cost to Rebuild Canada’s Infrastructure?”

¹⁴ OECD, *Getting Infrastructure Right*.

¹⁵ Mackenzie, “Canada’s Infrastructure Gap.”

¹⁶ Association of Consulting Engineering Companies Canada et al., “Canadian Infrastructure Report Card 2019.”

Figure 2. Condition and replacement value of public infrastructure assets by type



Data Sources: Statistics Canada 2022 Canada's Core Public Infrastructure Survey

CREATING A MORE COMPETITIVE ECONOMY

Strategic infrastructure investments support economic activity, including trade and innovation. Critical improvements in mobility and communications technologies are part of the solution to Canada’s stagnating productivity, which has lagged that of the United States for years and has slumped still further since the pandemic, particularly in key industries such as construction and services.¹⁷ Lower productivity can be a vicious circle, leading to lower wages and lower government revenues, which in turn affect public sector investment and quality of life.

Our relationship with the United States, our largest trading partner by far, depends on modern, well-maintained transportation links, including bridges, ports, and roads. The imminent opening of the Gordie Howe International Bridge between Windsor and Detroit, which will provide an uninterrupted highway connection at the busiest Canada-U.S. border crossing, will be a big step forward in this respect. But the pandemic also revealed the tenuous nature of our joint supply chains, and the importance of building infrastructure networks that are resilient to future shocks, including from extreme weather events.

Physical infrastructure such as pipelines and communication networks are at the heart of our economic competitiveness; further expansion will allow us to develop our national competitive advantages in natural resources, finance, and technology. Multimodal infrastructure corridors, which include rail, road, communications, and utility networks, have the potential to open our northern regions and grow both interprovincial and international trade.¹⁸ Our civic infrastructure is also critical: Canada is by some measures the most educated country in the world, but we will need to continue to invest in educational infrastructure to maintain this level, particularly in fast-growing areas of the country. We can also do more to address a persistent mismatch between the foreign qualifications immigrants hold and the jobs they end up working in Canada, particularly in critical sectors such as health care and information technology.¹⁹

The short-term benefits of expenditures on infrastructure investments can be significant, generating new employment opportunities. However, an ad hoc approach to this spending risks overextending available labour and equipment, driving up costs as various projects – both public and private – compete at a time when infrastructure costs nationwide are already skyrocketing. This is one more reason for taking a full-picture strategic approach to determining priorities, then staging construction accordingly, rather than getting stuck in a cycle of boom-and-bust, reactive spending. For example,

¹⁷ Caranci and Marple, “From Bad to Worse.”

¹⁸ Tombe, Munzur, and Fellows, “Implications of an Infrastructure Corridor for Alberta’s Economy.”

¹⁹ Statistics Canada, “Canada Leads the G7 for the Most Educated Workforce.”

the federal initiative to develop a high-speed passenger rail service between Toronto and Quebec City, with stops in Ottawa and Montreal, may well pay dividends in terms of connectivity and economic growth. Yet a project of this scale and scope is certain to require an expensive, complex, and challenging planning process, raising questions about possible cost overruns and overall value for money.

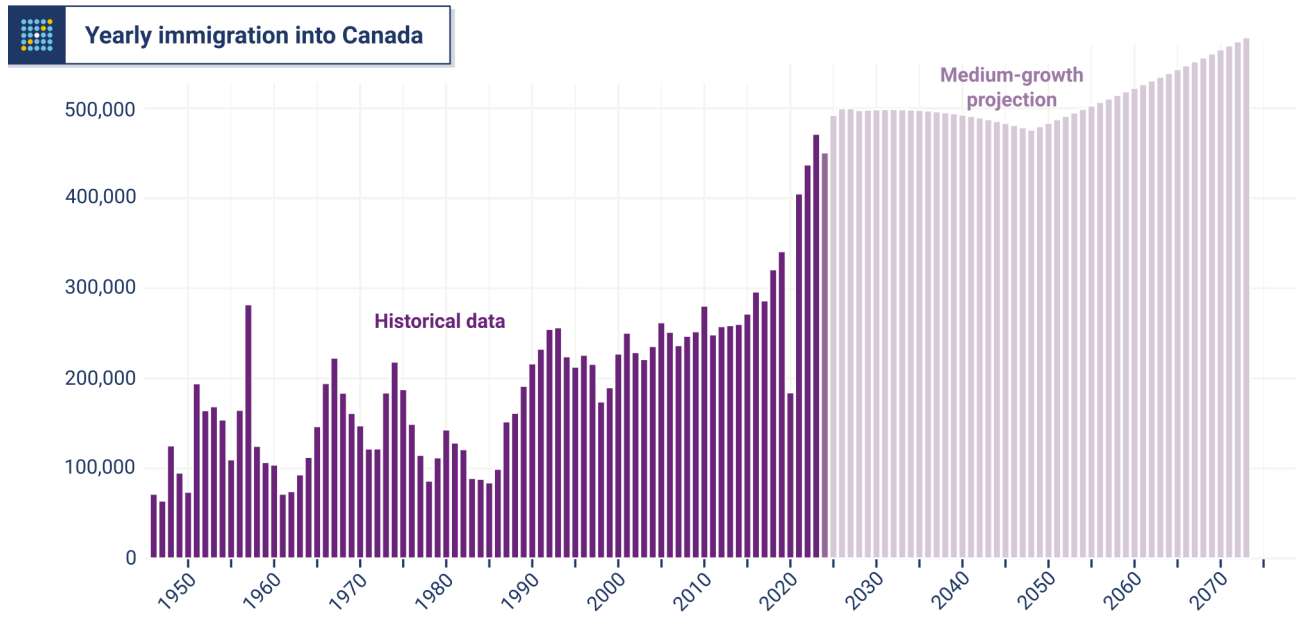
A strong and competitive economy must also be an equitable one, in which geography is not a determinant of the quality of infrastructure – or of life. With uneven investments, we risk amplifying existing differences through our infrastructure spending: between north and south, wealthy and poor, and urban and rural. Countries with independent infrastructure agencies have prioritized regional geographic equity better, recognizing gaps that can stall growth. Their approach includes recognizing the need for significant investments in resilient water and wastewater systems, rural broadband, and roads and transit networks in order to improve mobility for everyone.²⁰

²⁰ National Infrastructure Commission, “Second National Infrastructure Assessment”; Mallows, “James Heath”; Infrastructure Australia, “2022 Regional Strengths and Infrastructure Gaps.”

BUILDING COMPLETE COMMUNITIES

As in the decades after the Second World War, Canada is again experiencing rapid growth fuelled by high rates of immigration, particularly since the end of the COVID-19 pandemic (see Figure 3). Most growth has been in the areas surrounding the country’s largest cities, rather than in the built-up urban core. Infrastructure construction and maintenance, stalled for years, has not kept pace.

Figure 3. Historical and projected rates of annual immigration to Canada, 1945-2075



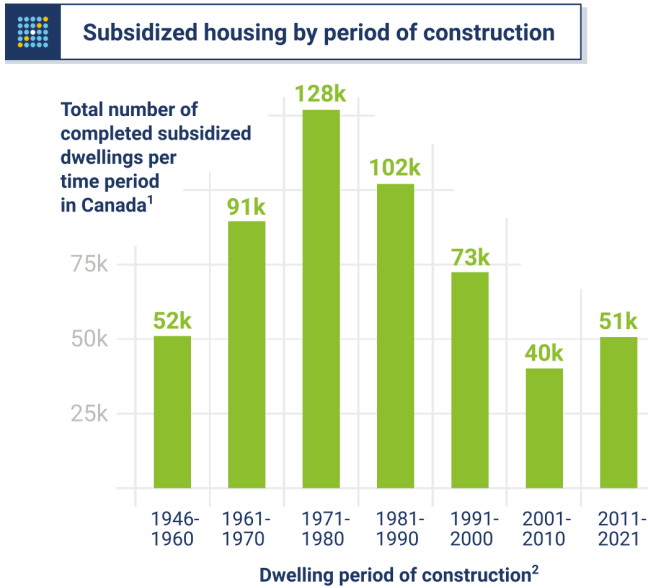
Data Sources: Statistics Canada

The issue of housing currently dominates the national conversation, and for good reason. Starting in the 1940s, the Canadian government encouraged housing creation – first for the middle class, through homeowner loans and other subsidies and assistance (see Figure 4). For those who could not afford market-rate housing even with such support, there was public housing (sometimes called social housing). Beginning in the 1950s, the federal government invested in the construction of thousands of units of housing annually, but this program fell victim to budget cuts in the 1980s.²¹ In the mid-1990s, the federal government transferred responsibility for social housing to the provinces and territories, many of which in turn passed it on to municipalities, with predictably uneven results. By 2000, social housing represented just 2% of all housing construction, compared with 13% in the early 1970s.²² This rapid decline in the number of new affordable units is contributing to a growing constraint on the overall number of homes being built across the country.

²¹ Suttor, *Still Renovating*.

²² Suttor, *Still Renovating*.

Figure 4. Completed public housing units in Canada, 1946-2021



Data Sources: Statistics Canada 2021 Census of Population

¹Totals are based on occupied dwellings as of 2021, does not include unoccupied dwellings

²Refers to the period in which the building was completed, not the time of any later remodelling, additions, or conversions

Decades of suppressed housing construction laid the groundwork for the current housing crisis. The financialization of housing, which makes it as much an investment to be accumulated by corporations as a place to live for families, has exacerbated the problem. With available units per capita remaining low and prices high, fewer young people can afford to move out on their own. A recent report from the Office of the Parliamentary Budget Officer estimates that 631,000 household formations were suppressed in 2021 – that is, 4.1% fewer households were formed across the country than would have been the case with more attainable housing options. Canada’s housing gap will grow to 1.3 million units by 2030 if housing completions continue at the current rate.²³

Both urban infill and suburban housing will also require more infrastructure of all kinds, from additional power, water, and sewer capacity to more school spaces, recreation centres, and parks. Denser cities are less expensive to build and run, and have smaller climate impacts, but are often more technically and politically challenging, as they involve intensified construction in existing neighbourhoods. Suburban housing tends to require infrastructure that is more expensive to build and maintain per capita, so recent programs and funding models have incentivized building housing strategically near transit. The federal government’s recent merger of its housing and infrastructure functions into one department is a signal of the importance of planning these in concert, including through integrated regional planning as required by the new Public Transit Fund.²⁴

The question of how to pay for the infrastructure that supports Canada’s rapid growth remains outstanding.²⁵ There is strong public pressure on governments to refrain from general tax increases and to eliminate user fees (such as road tolls), although Canada uses these less frequently to fund infrastructure than other major Western economies. There is also more focused pressure on governments to roll back development fees and other charges that municipalities rely on for “growth to pay for growth.” Something must give. The remaining option is to build and maintain new infrastructure through a big increase in public debt, although this transfers the cost burden to future generations.

²³ Office of the Parliamentary Budget Officer, “Household Formation and the Housing Stock.”

²⁴ Prime Minister of Canada, “The Largest Public Transit Investment in Canadian History.”

²⁵ For a discussion of various options within the federal system, see Boadway and Kitchen, “A Fiscal Federalism Framework for Financing Infrastructure.”

THE LINK BETWEEN INFRASTRUCTURE AND A STRONG DEMOCRACY

Social infrastructure plays a critical role in connecting us, by facilitating interaction across different income and ethnic groups. In *Palaces for the People*, sociologist Eric Klinenberg argues that social infrastructure such as playgrounds, libraries, and parks function as arenas for building connections across diverse groups, also known as bridging social capital. Moreover, when residents interact and even share responsibility for public infrastructure such as parks, cities reap benefits from improved safety and well-being.²⁶

As Canada's infrastructure has declined, we have seen socio-economic inequalities increasingly divide cities, polarize communities, and marginalize vulnerable groups, creating new challenges for participatory democracy and institution-building. People across many different walks of life depend on social infrastructure, and it strengthens the societal fabric by creating access to opportunity. Even as the public loses faith in other institutions, civic spaces like libraries consistently earn public trust.²⁷

Social infrastructure is also important for providing a space for vigorous democratic debate. Competing visions for infrastructure investments can exacerbate divisions – for example, between downtown and suburban communities – that have been a defining feature in Canadian politics for decades. While Canada is among the most urbanized countries in the world, two-thirds of Canadian city dwellers live in areas with suburban development patterns, with lower densities and greater car dependence.²⁸ The politics of highway construction, road tolls, and bicycle lanes, labelled by some as “the war on the car,” have been key to framing electoral coalitions for decades. The same is true of policies encouraging infill housing and the densification of existing neighbourhoods, which can create fault lines between generations as well as between existing and new residents. Social infrastructure institutions – including universities – provide spaces for inquiry and public engagement on these issues.

²⁶ Klinenberg, *Palaces for the People*.

²⁷ Rainie, Keeter, and Perrin, “Trust and Distrust in America”; Mattern, “Library as Infrastructure.”

²⁸ Gordon and Herteg, “Canadian Suburbs Atlas.”

LEARNING FROM INTERNATIONAL BEST PRACTICES

The benefits of robust infrastructure are maximized when it is built strategically. What would it look like for Canada to have more coherent infrastructure planning and prioritization? We can look to other parliamentary democracies that share a similar history and pattern of development for examples.

In Australia, an expansive country with a similarly decentralized federal system, an independent body provides advice about infrastructure investment to the elected parliament, based on rigorous cost-benefit analysis. Established in 2008, Infrastructure Australia is responsible for developing an Infrastructure Plan for Parliament every five years, which assesses infrastructure needs broadly across categories that include transportation, energy, climate resilience, health care and recreational facilities. The organization reports to the Department of Infrastructure, Transport, Regional Development, Communications and the Arts; its mandate includes oversight of business cases for all proposed projects over AUS\$250 million.²⁹ It also manages the Infrastructure Priority List, a pipeline of nationally significant unfunded proposals.³⁰ Though not without its critics, Infrastructure Australia has survived several changes in government, and similar organizations have been established in the two largest states, New South Wales and Victoria.

The United Kingdom has also set up an independent infrastructure advisory body, the National Infrastructure Commission (NIC), which is intended to be a counterweight to the “short-termism” of political financial cycles. The NIC adopts a 30-year planning horizon for its National Infrastructure Assessment, which considers current government progress toward infrastructure goals, the cost burden that new infrastructure will place on households, and how such infrastructure will contribute to economic performance. The organization reports directly to the Treasury and works within a fiscal remit of 1.1% to 1.3% of GDP per year, which forces the prioritization of projects.³¹ Recent recommendations have emphasized the importance of reducing regional economic disparities through investments in broadband and transport connectivity, and lowering carbon emissions (and energy dependency) by greening and updating the energy grid. Such work is not merely advisory: a National Infrastructure Assessment is required once per session of Parliament (every five years), and the government must in turn respond formally to the assessment within a year, with accepted recommendations becoming official government policy.³²

Though smaller, New Zealand has also created an independent infrastructure commission to create and manage a pipeline of priority projects. The impetus: uncertainty caused by an ad hoc infrastructure

²⁹ Originally the threshold was \$100 million, but this was revised up to \$250 million as part of a spate of recent reforms.

³⁰ Infrastructure Australia, “2021 Australian Infrastructure Plan.”

³¹ National Infrastructure Commission, “What We Do.”

³² HM Treasury (Great Britain), “National Infrastructure Commission Framework Document.”

investment climate – rather like Canada’s – which had in turn led to shortages in financing options and skilled labour for major projects.³³ The organization’s mandate includes planning and prioritization elements, as in Australia and the United Kingdom, but also broader capacity building for the infrastructure sector, including project management, leadership, and effective business case preparation. The country’s pipeline is transparent, with quarterly updates about which sectors are receiving public and private investment and why.³⁴

Table 1. Overview of national infrastructure planning organizations in selected countries

	United Kingdom	Australia	New Zealand
Population (2024)	68.3 million	27.5 million	5.4 million
National infrastructure planning body	National Infrastructure Commission	Infrastructure Australia	Te Waihanga / New Zealand Infrastructure Commission
Year established	2015	2008	2019
Mandate	<ul style="list-style-type: none"> • Deliver National Infrastructure Assessment once every parliament (~5 years) • Conduct research requested by government into specific infrastructure challenges • Provide annual report measuring government progress 	<ul style="list-style-type: none"> • Maintain Infrastructure Priority List • Develop Infrastructure Plan for Parliament every 5 years • Provide advice to ministers on opportunities for policy reform in infrastructure planning and delivery 	<ul style="list-style-type: none"> • Develop infrastructure strategy • Maintain public infrastructure pipeline • Provide research and policy advice about resource management, public opinion, funding • Maintain public-private partnership model for infrastructure and engage in capacity building around delivery, project management, and leadership capability
Oversight	Treasury	Department of Infrastructure, Transport, Regional Development, Communications and the Arts	Minister for Infrastructure, Regional Economic Development; Minister of Finance
Planning horizon	30 years	15 years	30 years
Fiscal constraint	1.1% to 1.3% of GDP per year	None*	None
Project evaluation	None	All projects seeking government funding over AUS\$100 million and some projects over \$30 million	All projects seeking government funding over NZ\$50 million
Government response	Mandatory within 12 months; once reports are endorsed they become government policy	None	Mandatory within 180 days

*Parliament has committed to a pipeline of AUS\$120 billion investment over 10 years.

Source: Adapted from Kathryn Exon Smith, “Building Back Better: Centralized Infrastructure Planning, Crisis Governance, and the Promise of Canada’s Permanent Transit Fund,” Master’s thesis, University of California, Berkeley, 2024.

³³ Singer, “Creating Value Through Procurement.”

³⁴ New Zealand Infrastructure Commission, “Pipeline Snapshot.”

We might also look to our southern neighbour for examples of how to integrate bottom-up planning with large-scale federal investment. The United States has long required, as a condition of federal funding, that transportation and land use planning be integrated at the regional level for metropolitan areas of more than 50,000 people. The result is a relatively sophisticated governance environment that considers existing population centres in concert with surrounding suburban regions and plans growth accordingly.³⁵

The U.S. approach also provides a model for large-scale infrastructure spending. Recent bills such as the Bipartisan Infrastructure Law, the American Rescue Plan Act, and the CHIPS and Science Act have authorized trillions of dollars in infrastructure spending in both physical and social infrastructure to shore up the nation's transportation, water, and communications networks, and to spearhead new energy and environmental protection projects. The bills are focused on delivering infrastructure quickly, equitably, and sustainably, and include measures to direct a significant portion of spending on climate, clean energy, affordable housing and transportation to communities that have historically been economically marginalized.

Strategic planning does not mean building more but building smarter. Canadian governments have been less willing than those in other countries to price infrastructure, for example, or to outsource it to private agencies that would charge for roads, highways, or bridges. The real cost of building and maintaining infrastructure is therefore hidden behind its status as a “free” public good, which may result in overbuilding or artificially high usage at economic and environmental cost. An overarching, whole-life-cycle infrastructure plan might spark policy reforms that would make better use of existing infrastructure and lessen the maintenance burden that today falls mostly on cash-strapped municipalities.

“The benefits of robust infrastructure are maximized when it is built strategically.”

³⁵ Barbour, Deakin, and Exon Smith, “Regional Planning for Sustainable Development.”

AN AGENDA FOR FUTURE RESEARCH AND ACTION

Canada faces an infrastructure deficit that is holding the country back. Our global competitiveness is at stake, and so too is our ability to maintain the quality of our physical and social infrastructure for future generations. We lack an understanding of our current infrastructure needs, including how inequities in accessing infrastructure affect the life chances of Canadian residents. This is particularly salient for Indigenous communities. As this essay has made clear, Canada has the task – and the opportunity – to fill the gap left by decades of insufficient focus and action.

The deficit in data and expenditure is matched by a deficit in planning. Too often our technical analyses lack sophistication, omitting cumulative and hard-to-measure impacts (like the displacement of people due to housing shortages). Perhaps most importantly, both the public and private sectors need to develop more effective approaches to implementing their infrastructure strategies, and the Canadian public (and its elected officials) need to make difficult decisions about how new and existing infrastructure will be paid for. More research and experimentation are required to identify the ideal approach.

The good news is that some of this work has already begun. In 2021, Infrastructure Canada released an engagement paper as a precursor to creating an “independent, non-partisan and credible advisory body” for infrastructure planning and prioritization.³⁶ Creating an independent agency to conduct assessment outside of political structures would be a critical next step toward long-range, evidence-based infrastructure policy. Such a body could also bring a degree of rigour and transparency to the prioritization process, which is often lacking in infrastructure decision-making at all levels of government.

Canada would also benefit from governance frameworks that give municipal concerns more weight at the provincial and federal levels.³⁷ There are few venues for collaboration and little of the kind of policy sharing that would level up the planning process nationwide. Other countries have had success in this way. South Africa’s extended federal cabinet includes municipal representatives for strategic planning on urban issues. In Australia, the Council of Australian Governments included representatives from all orders of government for nearly 30 years until it was disbanded during the pandemic.³⁸ While federal funding can drive the planning process at a national level, closer coordination with provincial and municipal government is essential in determining priorities and ensuring infrastructure can be effectively operated and maintained over the long term.

³⁶ Infrastructure Canada, “Building Pathways to 2050.”

³⁷ Hachard, “A Seat at the Table.”

³⁸ Hachard, “A Seat at the Table.”

Even if we succeed at improving our infrastructure planning, construction, and operations, Canada faces future uncertainty from within and without. The country may – or may not – be welcoming more immigrants and refugees as global challenges and crises grow. We may – or may not – succeed in diversifying the economy, such as by strengthening mineral production or by investing in digital and life sciences technologies. In any scenario, we will face infrastructure systems stretched to their limits, including from the effects of an increasingly unpredictable climate. We must begin the work of building the Canada of the future today. There is no time to waste.

“Canada has the task – and the opportunity – to fill the gap left by decades of insufficient focus and action.”

BIBLIOGRAPHY

Association of Consulting Engineering Companies Canada, Canadian Construction Association, Canadian Parks and Recreation Association, Canadian Public Works Association, Canadian Society for Civil Engineering, Canadian Urban Transit Association, Canadian Network of Asset Managers, and Federation of Canadian Municipalities. “Canadian Infrastructure Report Card 2019.” 2019. <http://canadianinfrastructure.ca/downloads/canadian-infrastructure-report-card-2019.pdf>.

Barbour, Elisa, Elizabeth Deakin, and Kathryn Exon Smith. “Regional Planning for Sustainable Development: Lessons for Canada from California.” University of Toronto School of Cities Working Papers, No. 1, May 2024. <https://schoolofcities.utoronto.ca/wp-content/uploads/2024/06/MPO-Regional-Planning-for-Sustainable-Development-Lessons-from-California-FINAL-30052024.pdf>.

Boadway, Robin, and Harry Kitchen. “A Fiscal Federalism Framework for Financing Infrastructure.” *In Canada: The State of the Federation: Canadian Federalism and Infrastructure*, edited by John R. Allan, David L. A. Gordon, Kyle Hanniman, André Juneau, and Robert A. Young, 75–113. Montreal: McGill-Queen’s University Press, 2018. <http://dx.doi.org/10.1515/9781553394570-008>.

Caranci, Beata, and James Marple. “From Bad to Worse: Canada’s Productivity Slowdown Is Everyone’s Problem.” TD Economics, September 12, 2024. <https://economics.td.com/ca-productivity-bad-to-worse>.

Department of Finance Canada. “Safer, Healthier Communities: Infrastructure for Growing Communities.” Budget 2024. Government of Canada, April 16, 2024. <https://www.budget.canada.ca/2024/report-rapport/chap5-en.html#s5-4>.

Economist. “The World’s Most Liveable Cities in 2024.” June 26, 2024. <https://www.economist.com/graphic-detail/2024/06/26/the-worlds-most-liveable-cities-in-2024>.

Gordon, David and Remus Herteg. “Canadian Suburbs Atlas.” University of Toronto School of Cities, June 2023. <https://schoolofcities.utoronto.ca/research/canadian-suburbs-atlas/>.

Greenspon, Edward, Janice Gross Stein, and Drew Fagan. “Opinion: Canada Needs to Have a Plan for the U.S., No Matter Who Becomes President. That Starts with Making Us Matter More.” *Globe and Mail*, April 27, 2024. <https://www.theglobeandmail.com/opinion/article-canada-needs-to-have-a-plan-for-the-us-no-matter-who-becomes-president/>.

- Hachard, Tomas. "A Seat at the Table: Municipalities and Intergovernmental Relations in Canada." Institute on Municipal Finance and Governance, 2022. https://tspace.library.utoronto.ca/bitstream/1807/111338/1/imfgpaper_no59_intergovernmental_tomashachard_may_17_2022.pdf.
- HM Treasury (Great Britain). "National Infrastructure Commission Framework Document." October 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1028251/Updated_framework_document_v.final2.pdf.
- Housing, Infrastructure and Communities Canada. "Government of Canada Launches Data Hub on the Economic Impact of Infrastructure Investment." October 29, 2018. <https://www.canada.ca/en/housing-infrastructure-communities/news/2018/10/government-of-canada-launches-data-hub-on-the-economic-impact-of-infrastructure-investment.html>.
- Infrastructure Australia. "2021 Australian Infrastructure Plan: Reforms to Meet Australia's Future Infrastructure Needs." Australian Government, August 2021. <https://www.infrastructureaustralia.gov.au/2021-australian-infrastructure-plan>.
- Infrastructure Australia. "2022 Regional Strengths and Infrastructure Gaps." Australian Government, December 1, 2022. <https://www.infrastructureaustralia.gov.au/publications/2022-regional-strengths-and-infrastructure-gaps>.
- Infrastructure Canada. "Building Pathways to 2050: Moving Forward on the National Infrastructure Assessment." Government of Canada, July 29, 2021. <https://www.infrastructure.gc.ca/alt-format/pdf/nia-eni/nia-eni-2-en1.pdf>.
- Ipsos. "Public Opinion in Canada." June 29, 2023. <https://www.ipsos.com/en-ca/public-opinion-canada>.
- Klinenberg, Eric. *Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life*. New York: Crown, 2018.
- Mackenzie, Hugh. "Canada's Infrastructure Gap: Where It Came From and Why It Will Cost So Much To Close." Canadian Centre for Policy Alternatives, January 2013. <https://www.policyalternatives.ca/news-research/canada-s-infrastructure-gap/>.
- Major, Darren. "Replacing Canada's crumbling water, road infrastructure would cost more than \$300B: Statistics Canada." *CBC News*, October 21, 2024. <https://www.cbc.ca/news/politics/cost-to-replace-canada-water-road-infrastructure-1.7358394>.

- Mallows, Rob. “James Heath: The Future of Transport in UK Cities.” National Infrastructure Commission, June 21, 2023. <https://nic.org.uk/speeches/james-heath-the-future-of-transport-in-uk-cities/>.
- Mattern, Shannon. “Library as Infrastructure.” *Places Journal*, June 2014. <https://placesjournal.org/article/library-as-infrastructure/>.
- National Infrastructure Commission. “The Second National Infrastructure Assessment.” October 2023. <https://nic.org.uk/app/uploads/Final-NIA-2-Full-Document.pdf>.
- National Infrastructure Commission. “What We Do.” Accessed November 7, 2024. <https://nic.org.uk/about/what-we-do/>.
- New Zealand Infrastructure Commission. “Pipeline Snapshot.” Accessed November 29, 2024. <https://tewaihanga.govt.nz/the-pipeline/pipeline-snapshot>.
- OECD. *Getting Infrastructure Right: A Framework for Better Governance*. OECD Publishing, 2017. <https://doi.org/10.1787/9789264272453-en>.
- Office of the Parliamentary Budget Officer. “Household Formation and the Housing Stock.” April 11, 2024. https://publications.gc.ca/collections/collection_2024/dpb-pbo/YN5-114-2024-eng.pdf.
- Prime Minister of Canada. “The Largest Public Transit Investment in Canadian History.” News release. July 17, 2024. <https://www.pm.gc.ca/en/news/news-releases/2024/07/17/largest-public-transit-investment-canadian-hist>.
- Rainie, Lee, Scott Keeter, and Andrew Perrin. “Trust and Distrust in America.” Pew Research Center, July 22, 2019. <https://www.pewresearch.org/politics/2019/07/22/trust-and-distrust-in-america/>.
- Schwab, Klaus. “The Global Competitiveness Report 2019.” The World Economic Forum, 2019. https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.
- Singer, Leah S.J. “Creating Value Through Procurement: A Report Into Public Sector Procurement of Major Infrastructure Projects.” Entwine, August 2018. <https://infrastructure.org.nz/wp-content/uploads/2021/08/Infrastructure-NZ-Procurement-Study-Report-FINAL.pdf>.
- Sohi, Amarjeet. “What Will It Cost to Rebuild Canada’s Infrastructure?” *Yale Insights*, January 9, 2018. <https://insights.som.yale.edu/insights/what-will-it-cost-to-rebuild-canada-s-infrastructure>.

Spicer, Zachary. “The Rise and Fall of The Ministry of State For Urban Affairs: A Re-Evaluation.” *Canadian Political Science Review* 5, no. 2 (2011): 117–26. <https://doi.org/10.24124/c677/2011149>.

Statistics Canada. “Canada Leads the G7 for the Most Educated Workforce, Thanks to Immigrants, Young Adults and a Strong College Sector, but Is Experiencing Significant Losses in Apprenticeship Certificate Holders in Key Trades.” *The Daily*. Government of Canada, November 30, 2022. <https://www150.statcan.gc.ca/n1/daily-quotidien/221130/dq221130a-eng.htm>.

Statistics Canada. “Canada's Core Public Infrastructure Survey: Replacement Values, 2022.” *The Daily*. Government of Canada, October 21, 2024. <https://www150.statcan.gc.ca/n1/daily-quotidien/241021/dq241021b-eng.htm>.

Statistics Canada. “Stock.” *Infrastructure Statistics Hub* (website). Government of Canada, March 21, 2024. <https://www150.statcan.gc.ca/n1/pub/71-607-x/2018013/stock-eng.htm>.

Stoney, Christopher, and Tamara Krawchenko. “Transparency and Accountability in Infrastructure Stimulus Spending: A Comparison of Canadian, Australian and US Programs.” *Canadian Public Administration* 55, no. 4 (December 2012): 481–503. <https://doi.org/10.1111/j.1754-7121.2012.00235.x>.

Suttor, Greg. *Still Renovating: A History of Canadian Social Housing Policy*. Montreal: McGill-Queen’s University Press, 2016. <https://doi.org/10.1515/9780773548572>.

Tombe, Trevor, Alaz Munzur, and G. Kent Fellows. “Implications of an Infrastructure Corridor for Alberta’s Economy.” *The School of Public Policy Publications* 14, no. 1 (March 16, 2021). <https://doi.org/10.11575/sppp.v14i.70651>.

Transport Canada. “Ongoing Efforts for High Frequency Rail in the Toronto to Quebec City Corridor.” Backgrounder. Government of Canada, July 6, 2021. <https://www.canada.ca/en/transport-canada/news/2021/07/ongoing-efforts-for-high-frequency-rail-in-the-toronto-to-quebec-city-corridor.html>.

Wood, Nancy. “To Fix Canada’s Infrastructure, Billions Are Just Drops in the Bucket.” *CBC News*, August 27, 2015. <https://www.cbc.ca/news/politics/canada-election-2015-liberals-infrastructure-deficits-1.3206550>.



UNIVERSITY OF
TORONTO



General inquiries:

Contact us at schoolofcities@utoronto.ca or 1-416-946-7534

Learn more about us at schoolofcities.utoronto.ca

Acknowledgements:

Project Director

Karen Chapple

Data Visualization

Jeff Allen

Series Editors

Kathryn Exon Smith

Serene Tan

Design

Tony Chang

We extend our gratitude to the following individuals for their contributions:

Amy Rhoda Brown

Elizabeth d'Anjou

Kosta Diochnos

Priya Perwani

Sarah A. Smith

Felicity Heyworth

Aniket Kali

Ben Liu

Mia Wang

