

A Jump Start

Providing Infrastructure for More Housing



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Michael is a former city manager and Ontario deputy minister of municipal affairs and housing. He has served on the boards of the \$128 billion OMERS AC pension plan, McMaster University, Good Shepherd Non-Profit Homes, Inc., Toronto Lands Corporation and the Canadian Urban Institute. He was founding CEO of both transportation authority Metrolinx and regional health authority Mississauga Halton LHIN. His research publications focus on infrastructure, infrastructure finance and municipal issues.

This research paper has been prepared by Michael Fenn of Fenn Advisory Services Inc. for the Canadian Urban Institute. The opinions expressed are his own and do not necessarily represent the positions of the Canadian Urban Institute, the Canada Infrastructure Bank or any organizations with which Michael Fenn or Fenn Advisory Services Inc. may be associated. Any errors or omissions are the responsibility of the author.

Land Acknowledgement

The head office of the Canadian Urban Institute is located in Toronto, the traditional territory of many nations, including the Mississauga's of the Credit, the Anishinaabe, the Chippewa, the Haudenosaunee and the Wendat peoples, and is now home to many diverse First Nations, Inuit and Métis peoples from across Turtle Island. Toronto is covered by Treaty 13, signed with the Mississauga's of the Credit, and the Williams Treaty, signed with multiple Anishinaabe Nations.

This place continues to be home to many Indigenous peoples from across Turtle Island and we are grateful to have the opportunity to work on this land.

Further, CUI is cognizant that many urban planning practices reinforced racist and exclusionary practices of colonialism.

The work of city-building today must include confronting the legacies of the past and search for new approaches that centre around equity and inclusion, making cities for and with everyone.

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An aerial photograph of a residential neighborhood. The houses have various roof colors, including brown, grey, and red. There are streets with parked cars and some greenery. A large, dark blue text box is overlaid on the right side of the image, containing white text. A blue arrow points to a specific house in the lower-left quadrant of the image.

Given the size, breadth and cost of the housing-enabling infrastructure needed to double the volume of housing starts in Canada, municipalities face unprecedented infrastructure funding and financing demands. Finding solutions will mean having a new conversation with Canada's municipalities about the risks and opportunities involved.



Executive Summary

Building housing-enabling municipal infrastructure on an accelerated basis is essential to increasing the supply of housing across Canada. In fast-growing parts of Canada, the cost of providing a full range of infrastructure likely exceeds \$100,000 per home over time.

Investment of that scale exceeds the financial capacity of the municipal sector, which owns and operates the majority of public infrastructure. It will require a considerable long-term investment by both the public sector and the private sector. It is a daunting but necessary venture and like some Canadian winter journeys, it may require a “jump start”.

Given the size, breadth and cost of the housing-enabling infrastructure needed to double the volume of housing starts in Canada, municipalities face unprecedented infrastructure funding and financing demands. Finding solutions will mean having a new conversation with Canada’s municipalities about the risks and opportunities involved.

This paper proposes four measures that should improve Canada’s prospects for achieving our housing-enabling infrastructure requirements:

- Moving from pre-payment to secured-payment for infrastructure over its useful life;
- Ensuring all beneficiaries contribute to infrastructure’s cost over time;
- Reducing municipalities’ infrastructure financial risks and limitations by using innovative financial models and private capital; and,
- Tailoring infrastructure financing models to the fiscal risks and realities of Canada’s small, rural and remote municipalities.



Introduction



Introduction

Canada is facing a serious shortage of housing across a range of types and affordability. The growth of the residential housing market in Canada has lagged demand for decades, especially for affordable and non-market housing. As supply failed to keep pace with demand, Canadian home prices have soared, limiting availability and choice.

To return to the level of housing affordability that Canada had in 2004, Canada Mortgage and Housing Corporation (CMHC) projects that by 2030, Canada must build 3.5 million additional housing units, for an increase from 2.3 million new homes to 5.8 million.¹ That level of increased annual housing construction – over 500,000 homes annually – is equivalent to building a new city the size of Calgary – each year, for seven years!

In response, governments at all levels are taking measures to make it easier to build housing, through more relaxed regulation and programs to support affordable housing and greater industry capacity (e.g., Québec’s construction-industry training programs). While municipal approvals for new housing and greater construction capacity are both important, without enabling civic infrastructure, housing cannot be built. Bluntly speaking, any new housing needs toilets and tap-water. Beyond those basics, moreover, all orders of government need to provide support in a period of rapid growth, as “infrastructure” extends to healthcare, education, social programs, energy-supply and public safety.





In cities across Canada, existing municipal plans generally anticipate infrastructure requirements at traditional levels of housing production. If housing production is to increase rapidly over the next seven years, infrastructure will need to be built, funded and financed on a greater scale and at a faster pace. It will require significantly more capital – both public and private – than is presently devoted to infrastructure, including the cost of building environmental sustainability into all aspects of infrastructure.

What actions will governments at all levels need to take to ensure infrastructure’s availability keeps pace with a significant increase in new housing starts? Given the fiscal constraints facing all governments – and particularly municipal governments – are there innovations in municipal funding and financing and/or ways to enlist more private investment in the construction of public infrastructure? What role could financial institutions play in facilitating those efforts?

This paper aims to offer potential answers to those questions.

It should be noted this report focuses on approaches municipalities can adopt to finance housing enabling infrastructure across Canadian provinces. There are also pressing needs for housing within Indigenous and Northern communities in Canada. With differing challenges in terms of geography, location, size and governance, among others, these are not addressed in the scope of this work.

Given the fiscal constraints facing all governments – and particularly municipal governments – are there innovations in municipal funding and financing and/or ways to enlist more private investment in the construction of public infrastructure?



Defining the Housing-enabling Infrastructure Gap



Defining the Housing-enabling Infrastructure Gap

More than 60% of all public infrastructure – from local roads and transit systems, through recreation and community facilities, to waterworks and fire halls – is the responsibility of Canada’s 3,500 municipal governments.² The tax base and other revenue sources of municipalities do not come close to meeting the many demands on local governments, including for community infrastructure.

What is housing-enabling infrastructure?

Recognizing that municipal governments receive less than 10 cents of each tax dollar collected in Canada, necessary municipal expenditures on public infrastructure need supplementary funding sources. In response, all three orders of governments have traditionally shared the capital cost of civic infrastructure, typically in the form of capital grants or favourable lending programs.

This effort has ramped-up dramatically in recent years, including recent announcements related to capital grants for water and wastewater infrastructure. The Government of Canada’s new *Canada Housing Infrastructure Fund* will provide \$1 billion directly to municipalities to support urgent infrastructure needs and \$5 billion for agreements with provinces and territories for longer-term priorities, conditional on freezing development levies in larger municipalities. The federal government also announced \$4.7 billion in funding to Ontario municipalities for infrastructure with an eye to enabling housing.³ In addition, the *Housing Accelerator Fund* was topped-up with an additional \$400 million and criteria were announced for the federal government’s forthcoming \$3 billion annual permanent public transit





Municipalities across Canada would cite the need for a wider range of infrastructure, from arenas and fire halls to schools and libraries, in order for new housing to comprise ‘complete communities.’

fund.⁴ Provinces and territories have supplemented these federal initiatives with their own grant programs for things like waterworks infrastructure. The Government of Canada has also channeled infrastructure grants and loans through the Federation of Canadian Municipalities (FCM), such as the FCM’s *Green Municipal Fund*, and in June 2024, it announced continuing funding of the Canada Community Building Fund (CCBF), with \$4.7 billion for Ontario.

Despite these major new revenues, the housing-related infrastructure challenge remains daunting.

Some would identify basic ‘enabling’ infrastructure for housing as primarily consisting of water, wastewater, roads, transit, and power-distribution infrastructure. Municipal leaders would respond that that list is too short. The list also includes some non-municipal responsibilities, such as energy networks and digital connectivity, where municipalities may still play a regulatory role. As Halifax Mayor Mike Savage emphasizes, municipalities across Canada would cite the need for a wider range of infrastructure, from arenas and fire halls to schools and libraries, in order for new housing to comprise ‘complete communities.’⁵



In doing its calculation of the estimated cost of infrastructure needed for new housing,⁶ FCM widened the definition of essential civic infrastructure. FCM also grouped individual types of infrastructure in its analysis, defining nine broad categories of infrastructure, which correspond to the asset-management inventory prepared by Statistics Canada.

The Federation of Canadian Municipalities’s Green Municipal Fund’s 9 broad categories of infrastructure:

- public transit;
- roads;
- bridges and tunnels;
- “active transportation”;
- potable water;
- stormwater;
- wastewater;
- solid waste; and,
- culture, recreation, and sports facilities (although Statistics Canada added municipal public, social and affordable housing assets).⁷

Large-scale housing production will eventually – and perhaps sooner than expected – require a full suite of infrastructure, including schools and local healthcare facilities. That will need generation-long investment by the public sector, commitments by all orders of government and, given the fiscal constraints on all governments, the involvement of private capital.

What infrastructure does new housing need?

Three classes of civic infrastructure

When a new housing development is approved by a municipality, that new housing will make use of three broad classes of civic infrastructure, although these “classes” are not mutually exclusive. LOCAL or on-site infrastructure; COMMUNITY, area or neighbourhood infrastructure; and, DISTRICT, regional or municipality-wide, ‘trunk’, commutershed and watershed infrastructure.

Figure 1 (next page) illustrates the types of infrastructure needed to build homes.



FIGURE 1

Three classes of housing-enabling infrastructure



Local on-site

Local streets and utility connections

- sidewalks
- curbs and gutter
- streetlighting
- stormwater drains
- water and wastewater lines serving the street and the individual homes, up to the property line
- energy or fibre-optic

Community neighbourhood

- collector roads
- trunk water, wastewater mains and pumping equipment
- recreation facilities
- parkland
- depending on scale: public schools, library, fire hall, traffic controls, future road widenings, arena, additional emergency vehicles



District

Municipality-wide, “trunk”, regional, watershed

- water and wastewater treatment plants
- solid waste disposal and recycling facilities
- major roadways
- public transit
- energy distribution facilities





There are examples where public authorities build housing across Canada, such as social housing projects, seniors' housing and shelters, but they are the exception. As governments at all levels aim to increase housing starts, it is important to remind ourselves that governments generally do not build housing in Canada: private developers and homebuilders do. That fundamental private-sector role includes not only land-development and housing construction; it often includes building and/or paying for much of the supporting infrastructure, especially on-site infrastructure.

Many housing projects currently “in the pipeline” can only proceed if certain essential infrastructure is provided. At the top of the list are potable water, wastewater (i.e., sanitary sewers and sewage treatment plants), stormwater drainage, energy distribution, local streets, and “new” infrastructure categories, like digital/ fibre/ broadband networks. Together, they also comprise the most-costly outlays for near-term housing-enabling infrastructure.

This is a crucial point. In many municipalities, the infrastructure “bottleneck” is typically not at the level of ‘local’ services to individual homes or buildings. It is at the level of ‘community’ or ‘district’ infrastructure: water and wastewater treatment plants, force mains and pumps; stormwater and drainage systems; energy distribution networks; solid waste disposal; public transit infrastructure, including vehicles; and, so on.

Many housing projects currently “in the pipeline” can only proceed if certain essential infrastructure is provided. At the top of the list are potable water, wastewater, stormwater drainage, energy distribution, local streets, and “new” infrastructure categories, like digital/ fibre/ broadband networks.



What would housing-enabling infrastructure cost?

As we learned from the past decade's debate about the size of Canada's infrastructure deficit, a clear consensus on a dollar-value is difficult to achieve, beyond the recognition that the figure likely runs into the hundreds of billions. Despite this, however, we should establish an order of magnitude, if only to demonstrate the scale of the financial challenge.

Using “replacement-cost methodology”, FCM has estimated that the cost of housing-enabling infrastructure would be \$107,000 per new home.

Calculating the cost of housing-enabling infrastructure depends on both underlying assumptions and the availability of reliable data. Using “replacement-cost methodology”, FCM has estimated that the cost of housing-enabling infrastructure would be **\$107,000** per new home.⁸ If applied to a housing-production target of **5.8 million homes** over the next seven years, that yields a huge projected infrastructure cost. It certainly exceeds anything that could be produced using the conventional public funding and financing tools available to municipalities.

Appendix A lists all municipally-related infrastructure. This list embraces and elaborates on the nine infrastructure categories adopted by FCM and used by Statistics Canada. It also adds infrastructure excluded in FCM's analysis, such as police stations and fire halls, along with their fleets, and local electricity distribution networks and similar public utilities, which would have raised the FCM's \$107,000 per-housing-unit cost estimate.⁹

To corroborate the FCM estimate, research for this paper looked at a cross-section of development-impact or development-charges studies and surveys undertaken in major metropolitan areas across Canada. This meta-research indicated that a similar estimate of per-housing unit infrastructure cost would be in the range of \$130,000 per home.^{10, 11, 12, 13, 14, 15, 16} After allowing for the additional infrastructure categories not counted by FCM, this figure essentially confirms FCM's estimate.



Three assumptions may also affect the calculation of per-housing-unit cost of infrastructure:

- First, in some instances, it might be assumed that the **infrastructure required by redevelopment in areas already served by existing infrastructure would be less extensive and less expensive than infrastructure serving new development** in so-called ‘greenfield’ or un-serviced areas. Of course, this is only true if the existing infrastructure is not at capacity or in poor condition.
- Second, it is widely accepted that **infrastructure for units of housing in medium-density or high-density residential developments would be less costly on an individual-unit basis** than a single-family home on a building lot in a residential subdivision.
- Third, it may ignore the fact that the **existing infrastructure was not designed to meet capacity demands of unanticipated additional density and contemporary climate-change impacts**, although the case can be made that “intensification” and “infill” development may come at a lower infrastructure cost and with greater ‘sustainability’, both financial (maintenance costs) and environmental.¹⁷

Impacts of intensification on infrastructure costs

Including upon Transit-oriented Development (TOD) and “Main Street” initiatives.

“Intensification” is a land-use planning policy aimed at producing more housing units per hectare. This may involve a new development precinct or, through so-called “infill”, it may entail inserting more housing units within an existing residential community.

With recently relaxed rules for “intensification” across the country, driven by initiatives like the Federal *Housing Accelerator Fund*, more housing production will come from intensification, including infill. By enacting “as of right” up-zoning rules for intensification of sites (including “inclusionary” zoning for affordable housing) and repealing “exclusionary” zoning throughout single-family home neighbourhoods, policy-makers are aiming to create more housing units within the existing fully-serviced “urban envelope” of cities and towns.



As Canadian Urban Institute’s research outlines, **the traditional place of the urban core and “Main Street” also needs to be reconsidered**, to generate residential communities of urban vitality, economic viability, and human scale. Medium-density housing can make an important contribution to revitalizing “Main Street” and building “complete communities”.¹⁸ The most prominent of these trends is the emergence of “transit-oriented developments” (TODs). With TOD, the precincts around rapid-transit terminals, transportation nodes and along rapid-transit lines are designated for much higher concentrations of housing, often using the nomenclature “major transit station areas” (MTSAs).¹⁹ MTSAs create a corresponding need for major infrastructure investments, beginning with the rapid-transit lines and stations themselves.

As a result, in major urban centres, new intensification and “infill” housing will be very prominent in TODs, typically around transit hubs, where redevelopment produces a large volume of high-density housing and other land uses. This pattern is already emerging:



The Montréal Metropolitan Community is developing a plan to be released in 2025 – *Projet de Politique métropolitaine d’habitation: Agir pour un Grand Montréal inclusif, attractif et résilient*, which will guide housing intensification efforts across the region.

“This is a very big shift. Last year almost all of Hamilton’s new housing development (90%) occurred through intensification, infill and redevelopment in already-urbanized areas.”²⁰

Jason Thorne, the City of Hamilton’s former General Manager of Planning and Economic Development





Practical limits to savings on infrastructure from ‘intensification’

Many argue that per-housing-unit infrastructure costs can logically be reduced by building new housing where legacy infrastructure is already in place. This view sustains planning objectives such as allowing more residential density around transit terminals or even across-the-board (i.e., residential “infill” projects, like four-plexes in residential neighbourhoods). Theoretically, these developments would use existing infrastructure and do not contribute to “urban sprawl”. In practice, however, there are firm infrastructure constraints.

One of the major constraints on housing development in any urban area is the availability and capacity of modern water and wastewater treatment plants, water and wastewater distribution and collection pipes, and storm-drainage systems. When these expensive facilities are built, fiscally prudent municipalities typically size them for the projected growth in population and industrial uses, based on past municipal plans. When unanticipated demands are imposed on this capacity, even with the help of water-conservation measures, the life-expectancy of the plants may be shortened or additional capacity may be required, in the form of expanded treatment plants or even new plants. The same is true for water, wastewater and



stormwater pipes, pumps and sewers designed for a volume that may be exceeded by previously unplanned-for growth.²¹ Changes in weather due to climate change are changing the intensity and duration of storms which also impact system capacity.

Since intensification occurs in areas where basic infrastructure is already in place, there is a misconception that the housing-enabling infrastructure requirements will be minimal. In some instances, that may be true, particularly for marginal projects or in smaller municipalities, where infrastructure may have under-used capacity. But overall, the need for infrastructure is largely driven by both the volume of homes and the population that will be living there. Even when housing development occurs in so-called “fully-serviced” urban areas, the threshold is quickly reached: the need to retrofit and add capacity to this infrastructure – and to meet higher, climate-influenced contemporary standards – can be a barrier.

The need for infrastructure is largely driven by both the volume of homes and the population that will be living there.

There is often a simultaneous need to expand roadways and alternative transportation infrastructure, increase water-main pressure/capacity for fire-suppression, and even to expand schools and recreation facilities.

While infrastructure may be available on a scale that suits existing uses, intensification necessarily means more intensive use of infrastructure. In response, some development-impact studies may recommend a “discount” in infrastructure levies for new development in TOD areas, but they may also propose a surcharge on standard development levies to fund infrastructure expansion.²²

Despite the densities produced by TOD-type redevelopment, this does not mean that the trend away from traditional mixes of housing types will continue at the current rate. Over the next decade, the Canadian housing market will need and demand more choice, in both affordability and types of housing.²³





Discounting the per-unit cost of housing-enabling infrastructure for “intensification”

There is, however, an argument for discounting the cost of infrastructure for “intensification” projects, based on the *size* of the housing units produced.

While it may not correspond to the needs of many middle-class families, Canada’s metropolitan housing markets have often been very successful at producing small housing units, like $\sim 55 \text{ m}^2$ ($\sim 600 \text{ ft.}^2$) apartments and condominiums. These units predictably make fewer infrastructure demands than traditional ground-related homes (four-plexes, triplexes, duplexes, semi-detached and $\sim 200 \text{ m}^2$ ($\sim 2,150 \text{ ft.}^2$) single-family homes).

In many development-charges studies, the capital charge imposed on new apartment units averages 60% of the levy imposed on single-family homes, with a range of medium-density formats receiving smaller reductions.²⁴ For our purposes, that would mean calculating the average infrastructure cost to service a two-bedroom apartment or condominium unit at 60% of the \$130,000 per-unit cost calculated earlier, i.e., $\sim \$78,000$. (See detail above).

Higher-density residential development argues for an adjustment in the basis of the overall projection of per unit infrastructure cost. The effect of these assumptions is to make infrastructure costs for TOD developments and other types of high-density intensification less expensive on a per-housing-unit basis. Given the preponderance of smaller units in these developments, the overall cost of infrastructure would also be lower.





To enable the construction of new homes, \$104,000 of infrastructure investment is needed.

Municipalities routinely calculate a lower infrastructure capital levy, based on a lower unit-cost for infrastructure, when applied to smaller housing units or for higher-density housing units, such as apartments, condominium units, and non-market “affordable” units. This reduction is partially based on the assumption that more dense residential formats make more efficient use of any public infrastructure, regardless of their location, unless there is a direct marginal impact from each additional infrastructure user.

It might be reasonable, therefore, to select a per-unit cost of housing-enabling infrastructure as lying between these two margins (\$78,000 for high-density and \$130,000 for single-family residential), or **\$104,000**. This estimate of the per-unit cost of housing-enabling infrastructure also closely conforms with FCM’s \$107,000 per-unit estimate, albeit using a much different methodology.

The risk environment facing municipal infrastructure investment

As an Ivey Business School study details,²⁵ building infrastructure entails six risks for municipalities:

- political and regulatory risk;
- governance risk;
- funding and financing risk;
- industry capacity risk;
- innovation and technology risk; and,
- environmental sustainability and climate-change risks.

Once approved, infrastructure projects – both large and small – still have persistent risks of delayed and over-budget delivery, replete with costly “scope-creep” and change-orders. Oxford University professor Bent Flyvbjerg is one of the world’s leading experts on the financial and scheduling failures of infrastructure projects.²⁶



His research confirms that municipalities are entirely reasonable to take a cautious, risk-averse approach to approving and financing major infrastructure projects, whether their own or those undertaken on their behalf by developers.

The link between the fiscal challenges facing Canadian municipal governments and the cost of building and refurbishing civic infrastructure needs to be emphasized. Unlike other orders of government, municipalities cannot run operating deficits, even during economic downturns or periods of peak growth. Municipalities must balance their operating budgets each fiscal year and those operating budgets must include debt-service payments and contributions to the annual capital program. Annual debt-service costs for infrastructure have a priority claim on municipal taxes and utility rates. (As an example, a recent report shows the impact of the City of Toronto's capital infrastructure program on that City's operating budget and property tax burden.²⁷ The City of Halifax has a similar experience: debt-service and contributions to the capital program comprise more than 10% of the annual operating budget (in 2024-25), effectively competing with a desire to mitigate property-tax increases.)

The bottom line: what level of housing-enabling infrastructure investment is required?

There are many demands on federal and provincial budgets, beyond municipal needs: healthcare, the environment, energy-transition, education, Indigenous reconciliation, industrial policy and national defence.

Based on the current state of public finances and the foregoing infrastructure cost estimates, it is reasonable to assume that any concerted effort to build the infrastructure essential for meeting Canada's housing needs will necessarily require innovative financing solutions, more private investment and potentially, leveraging some existing, legacy public assets, including municipal land, facilities and functions.



The current state of housing in Canada

Based on the foregoing analysis, we can conclude several things:

- The huge dollar-value estimates of **Canada's global cost of housing-enabling infrastructure** may vary, based on definitions and assumptions. What is clearer, however, is that **they exceed any reasonable municipal expectations for government capital grants or from municipal taxes, rates and development levies to service infrastructure debt.**
- The cost of housing-enabling civic infrastructure across major housing markets in Canada is likely in the range of **\$104,000 per new housing unit**. Since rate-based services such as water and wastewater can comprise as much as half the cost of new infrastructure (perhaps **\$50,000 per home**), that is infrastructure with the potential to generate revenues to support a reasonable return on invested capital over the lifecycle of the suite of infrastructure involved.
- The best candidates for infrastructure investments that produce housing in the near-term are **residential development projects that have already been approved or are in the now-accelerated "approvals pipeline"**. Beyond them, there are large tracts of land designated for urban development for which infrastructure will be required.²⁸ Many 'backlogged' projects cannot proceed due to lack of affordable infrastructure, infrastructure financing and/or suitable home-sale conditions for profitability-dependent homebuilders.



Without a significant infusion of new revenues and / or private capital, the housing-enabling infrastructure 'invoice' cannot be paid.



Even with funding commitments from the municipality and other governments, building housing-related infrastructure remains a risky business decision. Housing-development applicants must decide if it makes business sense to proceed and to advance the infrastructure funding to which they will be committed. For municipalities, favourable infrastructure-financing terms and municipal risk-transfer measures may be able to favourably influence those private business decisions. Timing-to-demand is an infrastructure risk for both municipalities and homebuilders: if the housing development fails, or growth stalls, or interest rates spike, who is at risk?

Although the overall infrastructure-investment shortfall is real and large, it may still be possible to bridge that gap. Coupled with government and development-industry financial commitments, the amount of additional *net revenue* required is considerably less than the estimated gross cost. However, covering the

revenue shortfall needs to be **triggered by confidence-building financial measures or supplementary**

financing to improve the risk profile for both

municipalities and the private sector that delivers infrastructure.

Covering the revenue shortfall needs to be triggered by confidence-building financial measures or supplementary financing to improve the risk profile for both municipalities and the private sector that delivers infrastructure.





If the risks can be mitigated, there is a solid prospect that near-term backlog in housing starts to be released, with the help of targeted infrastructure-financing measures.

If the risks can be mitigated, there is a solid prospect that near-term backlog in housing starts to be released, with the help of targeted infrastructure-financing measures. Beyond that, after finding ways to share the infrastructure risks, municipalities will need to take the time to plan, approve, fund, finance and build more substantial basic infrastructure, as well as to deliver the additional infrastructure that completes the array of infrastructure needed by a well-planned, growing community. That latter process of designing new infrastructure for new residential communities will also require serious consideration of sustainability issues, such net-zero energy targets, water-quality and sewer-separation, and designing parks and drainage areas to promote stormwater detention.



Barriers to Closing the Housing-enabling Infrastructure Gap



Barriers to Closing the Housing-enabling Infrastructure Gap

What's getting in the way?

Barriers to municipal infrastructure investment

Canada's housing-related infrastructure challenge is widely recognized and municipalities are generally in a good fiscal position. What is standing in the way of building and financing the necessary housing-enabling infrastructure? The answer seems to lie in four primary constraints.

Constraints to building and financing housing-enabling infrastructure:

- **The municipal debt conundrum**

Many municipalities are reluctant to incur debt because of its impact on property taxes and utility rates, especially for existing residents, even if the debt-service costs are amortized over many years. They look first to non-property-tax revenue sources;

- **The 'growth pays for growth' policy**

Municipalities in many parts of Canada insist that most new development 'pay its own way', often by pre-paying for the full capital cost of long-life infrastructure, partly to require the development industry to contribute to the cost of growth;

- **Opposition to "beneficiary pays" policies**

Many municipalities are reluctant to require new and future users of infrastructure to pay the full life-cycle cost of infrastructure; and,

- **Leveraging municipal assets; moving liabilities and assets off balance sheets**

Municipalities are often reluctant to provide a role for the private sector in delivering traditional public infrastructure and the services they support, particularly if it involves ownership or effective control of infrastructure or usage rates.





The municipal debt conundrum

Recognizing municipalities' heavy dependence on the property tax, provincial and territorial governments are vigilant in their oversight of the financial position of municipalities. In most provinces – although not all – fiscal prudence is interpreted as controlling the level of tax-supported municipal debt. One of the most common Canadian restrictions on municipal borrowing is the so-called “annual repayment limit” or ARL, which is a ratio of debt-service costs to municipal revenues.²⁹ While the established ARL can hover around 20%, or even rise to 25% in the case of rapidly growing municipalities, in practice few municipalities would approach half that amount. Fiscal conservatism – along with the use of development-related capital levies and capital grants from other governments – keeps debt levels much lower for most.

Although avoiding debt may seem prudent for all governments in an era of deficit-spending and rising public debt, municipal debt is fundamentally different. The deficits and debt of other orders of government fund significant annual operating costs, like social and healthcare program-spending and payroll expenditures. By contrast and by law, municipal debt is exclusively used for capital purposes, like long-life public infrastructure. Despite these limits, municipal infrastructure spending frequently achieves key objectives of federal and provincial/ territorial governments, while generating significant new tax revenues (the majority of which go to the Provincial and Federal governments) and enhancing regional economic productivity.³⁰

In the first 2/3rds of the 20th century, municipal debenture debt was used to fund most new or refurbished infrastructure projects. However, the infrastructure needed to support Canada's urbanization building boom in the 1970s and 1980s coincided with high interest rates, causing many municipalities to seek alternatives to debt-financing, such as development levies. Over time, that bias has become rooted in municipal fiscal policy in much of Canada. This initial bias has been

Municipal infrastructure spending frequently achieves key objectives of federal and provincial/ territorial governments, while generating significant new tax revenues (the majority of which go to the Provincial and Federal governments) and enhancing regional economic productivity.



reinforced by a property tax base that does not grow with the economy nor with demands for municipal services, and that has been buffeted by both the decline of the manufacturing tax base and more recently, with the erosion of retail and office commercial tax base. Debt is still used to refurbish existing infrastructure, but the combination of debt-limit regulations and municipal fiscal conservatism has created a “glass ceiling” of acceptable debt for many municipalities. This limit exists despite the fact that new development does generate more municipal revenues, utility rates and economic activity.

More significantly for purposes of this Research Paper is the fact that Québec municipalities did not generally follow this debt-avoidance policy for new development. Québec expanded its growth-related infrastructure using conventional municipal debt-financing, only recently securing legislation similar to the development charges legislation adopted elsewhere.

Municipalities have been innovative in the financial mechanisms that they employ to avoid incurring burdensome debt, in order to fund growth-related infrastructure. A number of municipalities have employed so-called “front-ending” schemes to pre-pay for infrastructure. Housing developers make capital payments to municipalities to ‘front-end’ the cost of building major infrastructure, to be ‘reimbursed’ later as capital rebates or development-charge credits. ‘Front-ending’ schemes may also involve a major developer building, at their cost, municipally-approved infrastructure, part of the cost of which is subsequently recovered from other homebuilders accessing that infrastructure at later time.

As interest rates and borrowing costs begin to trend down in mid-2024 from their July 2023 peak, and appear more stable, the “avoid debt” policy of municipalities deserves reconsideration. **The municipal tax base could support more debt to build housing-enabling infrastructure.** It could also leverage more opportunities for private capital investment in civic infrastructure.

Persuasive arguments have been made that municipal property taxation could yield more revenue and correspondingly, that municipalities could support considerably more infrastructure debt.³¹



“[S]trict rules on borrowing, sometimes self-imposed, have left municipalities with considerable unrealized borrowing capacity. Importantly, a shift towards increased borrowing, away from a reliance on intergovernmental grants, would reinforce the linkage between local government spending and accountability and keep spending priorities in order.”³²

“Canadian municipalities have considerable unrealized borrowing capacity. While the municipal ability to borrow has been institutionally constrained within the hierarchical world of provincial-municipal relations, it seems unlikely that these constraints have been the most significant deterrent inhibiting municipalities from borrowing. [It has been] suggested that the pay-as-you-go policies of many municipalities had enhanced their borrowing capacity and it was suggested that ‘if municipalities adopted a financing strategy that recognized the extended useful life of capital projects, their ability to fund an increased proportion of capital requirements, over the next several years, would be significantly enhanced’.”

Tassonyi and Conger)³³

This academic finding is not simply theoretical, as Québec demonstrates. Using property-tax-supported municipal debt, Québec’s municipalities have built a whole generation of top-quality municipal infrastructure. With 22% of Canada’s population, Québec’s municipal debt amounts to 38.5% of Canada’s total municipal debt.³⁴ Despite the resulting debt-service costs, Québec municipalities have reasonable property tax rates and a generally lower cost of housing in its metropolitan areas than other major Canadian urban centres.

(As with other orders of government, in Québec the assessment of municipal fiscal health in relation to debt tends to be the economist’s less-stringent measure of total taxable assessment balanced against the amount of outstanding debt, rather than the accountant’s contrast of annual debt-service costs against annual municipal revenues).

If revenues from development levies diminish or are unavailable and the municipality feels it cannot incur more tax-supported debt, how can the revenue shortfall be made-up? The simple answer would appear to be by opening the projects



to private-sector investment, supported by user-pay debt-service and cost-recovery measures. Given past municipal reluctance to countenance a robust private-sector role in financing and operating public infrastructure, however, municipalities need a viable alternative that does not impair the municipal balance sheet nor require support from general municipal taxation, thus not affecting the ARL. In subsequent sections, we suggest a way forward.

Obviously, if general property taxation revenues could be supplemented over time by a wider range of revenues, including user-rates, “land-value capture” (LVC) revenues, and beneficiary levies, the acknowledged but underutilized debt capacity of municipalities could be employed to fund more housing-enabling infrastructure.

Our conclusion:

Municipalities could prudently close the infrastructure financing ‘gap’ by being more open to higher levels of infrastructure debt, whether supported by general taxation, by infrastructure users, or by projected development-related revenues.



The ‘growth pays for growth’ policy

When a residential development is approved by municipal government, the municipality has two primary objectives:

- First, **any residential development proposal should represent good urban planning.** Good planning includes ensuring that the full range of infrastructure needed by any new housing will be available – some immediately, some over time.
- Second, across much of Canada, prevailing municipal fiscal philosophy posits that **the new taxable assessment from a new residential development barely covers the ongoing operating costs of additional municipal services to new housing and new residents.** Consequently, many municipalities have the fiscal policy goal that the capital cost of additional or expanded infrastructure should be fully funded by any new development that requires it. It should not form an additional financial burden on existing residents and businesses (who it is presumed, have already paid for the existing infrastructure, or are currently paying for it). Likewise, it is reasoned that any



new development should make a capital contribution for access to existing infrastructure capacity paid-for by past and current taxpayers and ratepayers (or to reimburse previous developers), such as water or wastewater treatment capacity. This is widely known as the “**growth pays for growth**” policy.

Whether or not they adopt an explicit ‘growth pays for growth’ approach to infrastructure financing, many municipalities use a variety of financial tools to recover some or all of the net cost of civic infrastructure. They are often a mix of pre-development measures and post-development measures.



Opposition to “beneficiary pays” policies

By levying the cost of new infrastructure on the developer, existing taxpayers contribute little to the capital cost of “growth” infrastructure. In addition, new residents and businesses avoid any ongoing tax levy or utility charge, although presumably infrastructure costs paid by developers and homebuilders find their way into property sale prices and rents.³⁵

As a result, local opposition to levying the cost of new or refurbished infrastructure on its beneficiaries can make such a proposal politically untenable.³⁶ Operating in the fiscally constrained and politically volatile municipal environment can also make it difficult for municipal officials to make long-term decisions or to fully fund depreciating physical infrastructure from current taxes and rates. (Even with warnings like the Statistics Canada infrastructure condition survey,³⁷ budgeting adequately for asset management plans can be politically challenging). The municipal political arena makes it much easier to finance municipal activities and facilities from general taxes and levies, rather than having those who specifically benefit from infrastructure pay for it, although the exception is well-regulated and/or ‘metered’ utilities, which can be more sustainable without direct taxpayer support.

To shift the burden of funding infrastructure away from the taxpayer, and onto the developer, municipalities have crafted several financing regimes. In many major metropolitan areas, “development charges” are imposed on developers and builders, with the municipality accumulating development-related financial reserves to be used for future growth-related infrastructure.





Leveraging municipal assets; moving liabilities and assets off balance sheets

For more than two decades governmental infrastructure agencies, pension funds and investment funds have endeavoured to engage municipalities with the proposition of reducing and transferring the financial and development risk of building and operating civic infrastructure. Some ultimately proved successful, despite delays, like the Vancouver’s Canada Line, the City of Edmonton’s Valley Line light-rail transit project³⁸ and Montréal’s REM South Shore automated light-rail line.³⁹ Fengate Infrastructure, on behalf the LiUNA labourers’ pension fund, invested in Edmonton’s 30-year-duration light-rail contract, which included equity investment by the construction consortium. In Montréal, CDPQ built, partially funded and financed the South Shore-to-downtown automated light-rail line.

For a variety of reasons, however, private investment in municipal infrastructure generally has not been embraced by municipal (and provincial) decision-makers to the extent that it has been in other countries.^{40, 41}





Changing the infrastructure risk conversation with municipalities

There is a growing need to build more housing-enabling infrastructure more quickly. In response, it may be timely to reframe the “risk transfer” conversation in ways that speak more directly to current municipal concerns and priorities. Faced with a need to deliver housing-enabling infrastructure rapidly and often without their own in-depth financial resources, municipalities may now be more open to risk-transfer options, if they can meet these criteria:

- **Protect the public interest** through governance or regulatory oversight;
- **Preserve public ownership and influence**, and take advantage of good municipal credit ratings;
- **Protect the taxpayer from non-performance** by those on which municipalities would depend in the infrastructure sphere;
- **Reduce the direct financial burden on municipalities** (and on their balance sheets) when building and operating infrastructure; and,
- **Allow a role for private capital to compensate for or mitigate municipal risks**, delays, debt limits and constrained municipal capital budgets.



When moving forward with housing-enabling infrastructure, municipalities will face two major constraints or risks:

- **Many municipalities remain reluctant to incur significant debt burdens**, especially if it affects the annual repayment limit or other debt-limits imposed on municipalities by provincial or territorial regulations. However, municipalities may now be open to: utilities and municipal services corporations (MSCs) incurring debt on their own behalf; or, securing ‘concessionary’ rates below their standard cost of borrowing, or flexible repayment terms, even if it includes private debt-financing.
- **A variety of fiscal and economic factors can put municipalities in the invidious position where their infrastructure expenditures run ahead (or run short) of the revenues needed to fund them;** or where municipalities must shoulder cost-overruns on cost-shared projects. The municipal order of government has the least capacity to shoulder cost-overruns. This is particularly onerous since municipalities are legally required by legislation to have balanced budgets and to deliver many critical services to high public safety, public health and environmental standards.

To what extent does lack of available, affordable infrastructure inhibit housing production?

There is great potential to build housing, if the financing for both housing and enabling infrastructure could be found. Some housing markets have thousands of acres and many in-fill sites suitable for residential development.

The backlog of housing approvals awaiting either access to infrastructure or other factors would yield a boon in home-building, including intensification. In Ontario, for example, municipal planning officials cite over 330,000 housing units as being “development ready”, with all requisite approvals in place, and a further 731,000 housing units in the now-accelerated development-approval “pipeline”, for a total of **1,061,000**.⁴² (This would represent 70% of the Ontario government’s own target of 1.5 million new homes by 2031).⁴³

As the foregoing facts indicate, there is widespread consensus that lack of infrastructure is hindering housing development. To emphasize new housing’s dependence on infrastructure (and infrastructure financing), the Ontario planning officials’ report adds this cautionary footnote:





“Some draft approved and proposed units will require supporting infrastructure to proceed to development. However, discounts and exemptions to development fees and charges may further hinder the timing of the construction of this required infrastructure,”⁴⁴

[Since municipalities may lack all of the funds traditionally contributed by developers and builders, in part due local waivers or to levy restrictions imposed by the governments of Canada and some provinces].

Substantial progress could be made in meeting Canada’s housing production targets, if more and better infrastructure and infrastructure financing and risk-mitigation was available.

There are other factors that hinder housing development, such as availability of consulting engineering capacity, skilled labour and trades, inflationary pressures and supply chain issues. Nonetheless, it is logical to assume that substantial progress could be made in meeting Canada’s housing production targets, if more and better infrastructure and infrastructure financing and risk-mitigation was available.



How infrastructure is financed today

The operating cost of the dozens of municipal services is largely supported by property taxes and utility rates and other fees, such as transit fares. As noted above, these municipal expenditures and offsetting revenues are legally required to be balanced each year.

Although derived from the current budget, capital grants and reserve-fund contributions, the capital cost of the infrastructure to support these services is separately budgeted. In essence, infrastructure must ‘pay its way’ by generating “earmarked” revenue from the infrastructure’s users and beneficiaries and/or the revenue from initial or ongoing capital contributions by governments (including municipal budgets and local utilities) and by land developers.

Ultimately, the cost of infrastructure must be paid from some combination of revenue sources – or the projects will be delayed or abandoned. While financing may exist to bridge timing challenges, it is inherently inflexible. **Municipalities will generally not proceed with infrastructure and housing projects, unless they have an assurance that current or projected revenues will cover the capital cost of infrastructure projects.**

Given their fiscal pressures, municipalities across Canada exercise fiscal conservatism in undertaking capital projects. In the case of new housing developments, in some provinces the practice is to accumulate financial reserves and reserve funds to pay for planned future infrastructure projects, based on estimated date of need and construction. This can result in very large reserve-fund balances dedicated to future infrastructure projects. For example, the Financial Accountability Office of Ontario (FAO) queried large development-related financial reserves held by municipalities. The FAO noted that:

*“Municipalities maintain reserve funds to finance future spending requirements and protect budgets against unexpected changes in revenue and expenses. In 2018, these reserves totalled \$31.9 billion across all municipalities, of which \$30.3 billion was earmarked for specific purposes and \$1.7 billion was available for budget stabilization, such as mitigating the impact of recessions”.*⁴⁵



In jurisdictions like Ontario, where the accumulated development-related reserves are substantial, approximately half are devoted to future water and wastewater projects and related local connections, or for their debt-service over time. The use of development-charge reserves is legally constrained and not discretionary, and they are replenished as new developments pay their development levies. In addition, those paying for major infrastructure projects may well pay for that infrastructure long before the infrastructure is available to them to use.

Experience does vary across Canada. In Québec, by contrast, infrastructure has traditionally been financed on a pay-as-you-go model, using municipal debt. Although the use of reserves and capital contributions from the current budget are now being employed by some larger Québec municipalities, development-levy legislation is relatively new to Québec municipalities.

Where they are used, the key to ‘liberating’ or advancing the necessary reserve-fund balances may lie in the right mix of infrastructure *financing* arrangements to reduce uncertainty. For example, some funding shortfalls are straightforward, such as awaiting a deal-closing contribution from a municipality, another level of government or a developer (i.e., in order to assemble the funds needed to commission otherwise-approved infrastructure projects).

Given their fiscal constraints, including self-imposed or regulatory debt limits, and the uncertainty and volatility of the homebuilding industry, municipalities may not be willing to gamble on projected infrastructure demand and existing municipal finance tools. They must either borrow – or wait.

Municipalities may not be willing to gamble on projected infrastructure demand and existing municipal finance tools. They must either borrow – or wait.



In many instances, the potential sources of infrastructure financing could be freed-up:

- If the investment risk profile was lowered;
- If the business case for building infrastructure was strengthened;
- If the terms of funding and/or financing were more responsive to the volatility of demand for infrastructure; and,
- If there was more public-sector willingness to accept (and legislative authority to promote) a larger private-sector role in providing municipal infrastructure and infrastructure financing.

Which infrastructure generates “earmarked” revenue?

While municipalities may argue that a full range of infrastructure is a pre-condition for any “complete community”, investors must focus on the potential for return on investment. As noted earlier, some infrastructure categories generate revenue that can be employed for capital financing, while others do not. It is equally true that some new infrastructure realizes a one-time revenue from developers or other sources, depending on the jurisdiction and local fiscal policy. Finally, some infrastructure can be segregated by area or customer base, and generate additional, infrastructure-related revenues.

Given that municipalities have better credit-ratings and command better borrowing rates than most commercial enterprises, **simply offering access to private capital is unlikely to interest municipalities**, especially if it involves surrendering control through sale of equity or transfer of assets. For municipalities, **the appeal of risk-transfer will more likely be in financially assuring delivery of infrastructure on time and on budget, with working technology and realizing predicted operating costs and revenues**. Under these circumstances, the marginal additional cost of private capital, or a bigger infrastructure role for the private sector, might be seen as an ‘insurance policy’ against financially and politically unsupportable infrastructure-delivery non-performance.

On this basis, some of the infrastructure projects with the greatest potential for leveraging risk-sharing and for attracting private investment are likely.



Infrastructure projects with the greatest potential for leveraging risk-sharing and for attracting private investment

- **Infrastructure that can generate revenue** (water, wastewater, stormwater, solid-waste disposal, energy-distribution and digital/ fibre/ broadband network infrastructure);
- **Infrastructure serving development nodes** (like TODs, along transit lines, or in new development precincts); and,
- **Infrastructure being built to serve a region, a watershed, or an inter-municipal collaboration.**⁴⁶



As noted above, in most provinces and territories, the basic infrastructure categories that have the potential to generate sufficient revenue to finance their capital cost, notably water and wastewater, may represent approximately half the cost of new infrastructure. In Montréal, for example, water and wastewater infrastructure assets represent more than half the value of all municipal assets.⁴⁷ While other infrastructure may generate revenues, such as public transit, municipal parking structures, social housing, and community recreation programs, they are generally insufficient to cover their capital cost or even their net operating costs. Some local infrastructure, like local roads or public safety infrastructure, generate no significant direct revenues, although they may benefit from scheduled capital contributions from multi-year municipal and public utility budgets (e.g., roads or police budgets).





Where there is a tradition of metering consumption, some of that growth should contribute to and justify the cost of large-scale supporting infrastructure, like water treatment, energy distribution and stormwater management systems.

While it is debated, some argue that perhaps half of all new housing-enabling infrastructure has sufficient revenue-generating potential to warrant a reasonable return on investment, provided the time-frame for the investment reflects the long life-cycle of the infrastructure it finances.

It is also reasonable to assume that significant growth in suburban or ex-urban municipalities would produce a parallel expansion in their property tax base and utility customers. Where there is a tradition of metering consumption, some of that growth should contribute to and justify the cost of large-scale supporting infrastructure, like water treatment, energy distribution and stormwater management systems.




Based on the categories and classes of municipal infrastructure outlined in Appendix A, Table 3 is an admittedly subjective analysis of the kinds of infrastructure that might have either direct revenue-producing potential, be suitable for transfer to municipal services corporations, lend themselves to land-value-capture, or offer a role for private-sector investment.




TABLE 1

Infrastructure financing and delivery options

Legend:

-  Good prospect
-  Some potential
-  Unlikely

	Function/Service/ Facilities	Lease/ Concession/ Franchise	Revenue source	Availability Payment/ Rent	Municipal Services Corporation	LVC potential
1	Roads/bridges					
2	Sidewalks/ streetlighting/ hydrants					
3	Parking facilities/ collection/ traffic control					
4	Public Transit, incl. fleet					
5	Rapid Transit – LRT, BRT, subway					
6	Airports/marinas/ harbours					
7	Police/Fire					
8	Emergency Medical Services / Land Ambulance					
9	Potable Water					
10	Wastewater					
11	Stormwater/drainage					
12	Conservation/ re- use/ rural irrigation/ 'greywater' systems					
13	Arenas/ recreation/ libraries/ culture/ parks/ heritage/ sports facilities					



	Function/Service/ Facilities	Lease/ Concession/ Franchise	Revenue source	Availability Payment/ Rent	Municipal Services Corporation	LVC potential
14	Local energy distribution	●	●	●	●	●
15	Local energy generation / co-gen	●	●	●	●	●
16	Energy conservation – municipal / utilities	●	●	●	●	●
17	Energy transition – community	●	●	●	●	●
18	Energy transition – municipal / district energy	●	●	●	●	●
19	Solid waste collection – fleets	●	●	●	●	●
20	Solid waste disposal – sites and remediation	●	●	●	●	●
21	Waste-recovery, recycling, energy-from-waste	●	●	●	●	●
22	Indigenous-municipal services and enterprises	●	●	●	●	●
23	Administrative facilities	●	●	●	●	●
24	Broadband networks	●	●	●	●	●
25	Shelters, emergency housing	●	●	●	●	●
26	Long-term care homes	●	●	●	●	●
27	Social Housing/ public housing	●	●	●	●	●
28	Hospitals/clinics	●	●	●	●	●
29	Potential new infrastructure roles (decarbonization, sustainability, etc.)	●	●	●	●	●





Municipal infrastructure investment: Could pension funds do more?

As municipalities explore sources of borrowing for new infrastructure, many will initially look to government-created financial entities. These include the Municipal Finance Authority of British Columbia, the New Brunswick Municipal Finance Corporation, Infrastructure Ontario, the new “Nova Scotia Municipal Finance and Treasury Board”, the Canada Infrastructure Bank (CIB) or, as supported by the Government of Canada, FCM’s *Green Municipal Fund*. Some of these public entities also aim to include private financing.

Beyond governmental organizations and conventional bank financing, however, there are other financial institutions that would potentially be interested in municipal infrastructure debt and related infrastructure investments. Along with other sources of private capital, major Canadian public-sector pension funds have a particular interest in reliable, long-term investments, such as infrastructure.

For infrastructure investments, pension funds favour an impartially-regulated investment environment with a reasonable, risk-adjusted rate-of-return for current and future pensioners. The risks to which municipalities are exposed in developing infrastructure may not be a good ‘fit’ for pension funds’ investment portfolios, in the absence of a way to partially de-risk these investments. (One option may be to ensure that rate-based infrastructure, like water services, are regulated utilities, with rate-structures that include an allocation to capital expenditures and depreciation).

Pension funds frequently avoid the risk-laden initial phase of infrastructure development and construction, in favour of investments in “going-concern” infrastructure, where the risk premium can be profitably taken-off with refinancing.



If this risk exposure could be reduced through risk-sharing, some of this pension-fund reluctance to invest in infrastructure development and construction might also be reduced. Of course, there would also have to be more projects of sufficient scale to interest major investors, as well as investment vehicles where private investment is welcomed into Canadian infrastructure ventures.

In Canada, an important source of ‘private’ investment capital is the so-called “Maple Eight” public-sector pension plans (CPP, CDPQ, Ontario Teachers, HOOPP, OMERS, AIMCo, PSP and BCI). Two additional obstacles to large pension funds investing in municipal infrastructure projects are small scale and relative scarcity of ‘investible’ projects. The “Maple Eight” and similar large investment platforms often have minimum investment thresholds for assets like public infrastructure projects.

While there is some pressure to see public-sector pension funds do more to finance the effort to reduce Canada’s infrastructure investment “deficit”,^{48, 49} the big pension funds have clear investment criteria and must preserve fiduciary discretion in making their investment decisions.⁵⁰ The 2024 Federal Budget has announced the creation of a Working Group on domestic investment opportunities for Canadian pension funds, to be chaired by former Bank of Canada Governor Steven Poloz, including a focus on physical infrastructure and housing.⁵¹

Through pooling of projects, financial innovation, or risk-mitigation by co-investors, there may be opportunities to engage these large investment platforms on terms that meet their requirements, as well as those of municipalities. Changes in tax rules regarding equity investments in public infrastructure by public pension plans would also help.

A role for the Canada Infrastructure Bank in housing-enabling infrastructure

The commercial utility model or the inter-municipal agreement model can be employed to build and operate some municipal infrastructure. Where this is done, private investors may favour arrangements wherein a designated area pays a surcharge or royalty for the ongoing benefit of one or more infrastructure projects, or where one or more categories of infrastructure are provided to a group of municipalities (and/or neighbouring First Nations), as with CIB’s south Manitoba environmental project.⁵² Financing entities like CIB are in a position to offer municipalities financial assurances to enhance their confidence that long-term infrastructure financing and funding commitments will be met. The CIB’s recently-announced “*Infrastructure for Housing Initiative*” (IHI) is a good example.





The CIB's Infrastructure for Housing Initiative (IHI)

The *Infrastructure for Housing Initiative*⁵³ focuses on some of CIB's key infrastructure priorities:

- **Water:** water, wastewater, stormwater, conveyance;
- **Transportation:** roads, bridges and the accompanying civil work;
- **Transit:** electric buses, light-rail transit, stations and terminals; and,
- **Clean power:** district energy, electricity distribution, storage.

IHI targets “both ends” of the municipal infrastructure investment agenda. Eligible infrastructure investment projects include both “**last-mile**” infrastructure, identified by a municipality as necessary to their near-term plans for enabling new residential housing development, as well as bigger or longer-term “**net-new large-scale**” projects.

IHI targets “both ends” of the municipal infrastructure investment agenda: “last-mile” infrastructure, identified by a municipality as necessary to their near-term plans for enabling new residential housing development, as well as bigger or longer-term “net-new large-scale” projects.



IHI addresses three of the significant risks facing municipalities:

- IHI enables municipalities and utilities to build infrastructure *in advance* of growth, by relying on CIB borrowing terms to reduce growth-related risk. IHI aims to share the risks of ‘timing’ community growth, linking repayments to the number of housing units expected to increase as housing growth materializes. IHI expects that these de-risking features will allow municipalities to **build faster and bigger today**, in anticipation of future growth. Importantly, it would supplement and align with Government of Canada’s capital grants and housing programs;
- IHI provides municipalities and their subsidiary corporations with access to capital at low rates (particularly for **smaller municipalities** without ready access to capital or to provincial borrowing programs), supplemented by private capital at competitive rates. The ‘blended’ interest rate – a combination of a concessionary rates from CIB and financing at commercial rates – for the infrastructure loan would thus be better than, or equal to, borrowing costs for Canada’s most highly-rated municipalities; and,
- IHI is open to wholly-owned municipal subsidiary corporations (development corporations, MSCs or utilities), which can be **off-balance sheet financing** for municipalities themselves.
- The IHI has the advantage of attracting private capital to infrastructure investment on terms that most municipalities would find acceptable. A loan from the CIB and a private lending partner funds the cost of infrastructure to enable housing growth. The loan terms would share in the risk of anticipated residential growth materializing by ‘pricing-to-growth’ and being repaid through dedicated revenue streams.



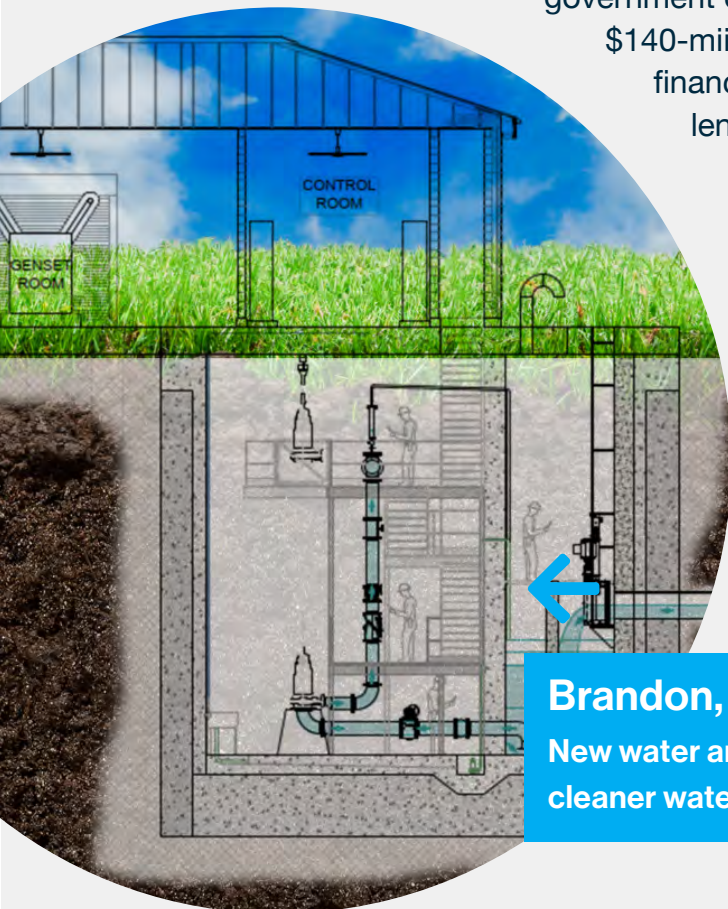
CASE STUDY:

Risk-sharing among Manitoba municipalities and investors

- A good early example of how IHI would work can be found in the water and wastewater infrastructure projects to serve five growing municipalities in the Red River, Seine River and Rat River watersheds in southern Manitoba. Working with the City of Brandon and the four rural municipalities of Red-Seine-Rat Wastewater Co-operative, CIB has used this model to shift the revenue risk from the municipalities to the project investors, should debt-supporting revenues take longer to materialized than currently projected.

- Complementing \$71-million-dollars in capital grants from the government of Manitoba and Infrastructure Canada, the \$140-million-dollar set of infrastructure projects will be financed by loans from CIB that are melded with lending from the credit union movement.^{54, 55}

- Upon completion, the projects will serve 78,000 homes, including 2,300 new housing units in the City of Brandon and a further 12,600 new homes across the region. The infrastructure will also generate significant environmental and greenhouse-gas-reduction benefits, as well as spurring a range of new economic and employment-creation activities in the region.



Brandon, Manitoba

New water and wastewater infrastructure will support cleaner water for approximately 78,000 housing units.

Other private investors in housing-enabling infrastructure

Beyond the major Canadian investment platforms, there are other financial institutions, including credit unions and smaller pension funds, with lower investment thresholds or with a particular focus on individual infrastructure projects that they understand well or that are of local interest:

- The large VanCity Credit Union (and its Foundation) in British Columbia has a social investing mandate that sees investments in affordable and non-market housing and social infrastructure.⁵⁶
- The Co-operators Insurance Group (and its institutional investing subsidiary, Addenda Capital) are Canadian leaders social-impact, sustainability and energy-transition investments.

Limited equity investments, senior loans, subordinated debt, and financial guarantees, can help to advance funding and financing decisions by private investors and other entities, as well as municipal decision-makers. For localized infrastructure investments in areas like community energy distribution, or water and wastewater services, there may be ways to employ financial arrangements guaranteed by contract or statute, like energy-service corporations (known as ESCOs), district energy corporations, municipal corporations or municipal utilities, or even using “limited dividend corporations” with a ‘rate-regulated return’, similar to those authorized by the *National Housing Act*.⁵⁷





Premature, non-contiguous or over-investment in infrastructure

Building new housing – and building the infrastructure to support it – relies on predictable, affordable markets for home-building, mortgage financing and home sales. There are many examples of those assumptions proving wrong, premature or uneconomic. While homebuilding may be a business decision, it has a direct impact on municipal decisions (and commitments) to build and finance enabling public infrastructure. They represent a significant municipal risk.

As noted earlier, the fact that there are so many approved but unbuilt housing units and development projects across Canada, even in ‘hot’ housing markets, can be traced to these every-present uncertainties:

- **Many municipalities do not want to invest millions in building community- and district-scale infrastructure now**, if it requires debt or uncertain capital contributions in the future. Unfinanced premature or “stranded” infrastructure is a political and financial risk to be avoided.
- **Municipalities want “fringe” development to proceed in an orderly, sequential fashion.** They avoid “leap-frogging” over intervening development (and infrastructure), even if a new residential development is otherwise ready to proceed.
- **Developers may conclude that their proposed developments are too early in the phased process of extending infrastructure.** They also may have to “wait their turn”. They may need to await “up-stream” developers proceeding first with their applications and meeting their obligations. They may need to await municipalities deciding to build the “trunk” infrastructure on which individual new housing developments will depend.



- **Market conditions change.** Homebuilders may conclude that development projects which made business sense a year or two ago are now uncertain. Faced with economic uncertainty, profit-dependent developers and homebuilders may curb their expenses by limiting borrowing and by refraining from building homes and the infrastructure to support it, until the market improves.⁵⁸

The foregoing realities may, however, point to a potential opportunity to accelerate the building of housing-enabling infrastructure. Although municipalities may record realty and other physical assets for balance-sheet and asset-management purposes, many municipal infrastructure and property assets are essentially treated as “sunk costs”. Their experience with building municipal industrial parks ‘on spec’ and oversizing water and wastewater treatment plants could be cited to municipalities as precedents, justifying extension of services to lands designated for future housing development, or to invest in greater water and wastewater treatment capacity.

Building infrastructure ‘on spec’ is not new to municipalities

Not surprisingly, some municipalities have had disappointing experiences when developing, servicing and financing municipally-owned business parks. Optimistically-anticipated new industries or other commercial lot sales may have failed to appear or were long delayed, leaving the municipality with ‘stranded’ assets and on occasion, with legacy debt. But in many cases, this speculative activity has successfully proved worth the risk. The thriving industries in former municipal business parks on the edges of many mid-size towns and cities across Canada give testimony to the success of this “speculative” infrastructure investment. Of course, there is a fundamental difference between demands for industrial land and residential land, but the risk-orientation has parallels.

Managing stormwater and drainage in an era of climate change has a variety of manifestations for infrastructure planners

One potential area for investment that would both enable housing and improve environmental quality is in separating so-called combined sewers. Combined sewers are a legacy of a time when both wastewater and stormwater were carried in the same sewer, a type of infrastructure that can be found in many older cities, such as Halifax and Montréal. Combined sewers have two main problems: they require sewage treatment plants to treat relatively clean rainwater run-off; and,



during storms, they risk overwhelming wastewater sewers and treatment capacity. This can lead directly to lack of capacity to support new development and spills of contaminated water into receiving bodies of water, like rivers and lakes, some of which are drinking water sources for other communities. Investments to separate sewers, funded by infrastructure funding programs, water-rate surcharges or drainage levies, could produce significant environmental benefits that mature cities and their utilities might not otherwise be able to afford or justify politically.

Some ‘over capacity’ risks are also mitigated with time

There are a number of Canadian municipalities that have ‘overbuilt’ legacy water and wastewater treatment facilities, because of optimistic growth projections or simply for engineering-related “economies of scale”.

Where those infrastructure costs have been discharged by capital grants and/or fully-retired debt, the municipality’s financial position is unaffected by a slow pace of growth but it is ready to proceed quickly, if housing demand grows or if industry expands.

In simple terms, municipal capital expenditure on infrastructure that is financed by debt (to be amortized by future beneficiaries, whether developers or end-users) depends on timely housing development. If housing development is delayed or fails to meet growth projections, municipalities face the risk of a mismatch between the timing of debt-service obligations and the availability of funding for the infrastructure from new housing. If that “delay risk” were shared by a party other than the municipality, municipalities would be less concerned about potentially “stranded” infrastructure or debt, or the associated costs and political risks. The same approach could be taken to allay the risk of employing new technology, or depending upon an uncertain supply-chain.

If housing development is delayed or fails to meet growth projections, municipalities face the risk of a mismatch between the timing of debt-service obligations and the availability of funding for the infrastructure from new housing. If that “delay risk” were shared by a party other than the municipality, municipalities would be less concerned about potentially “stranded” infrastructure or debt, or the associated costs and political risks.



Financing infrastructure: tools and options

In attempting to reframe the risk-transfer discussion about building and financing municipal infrastructure, consideration should be given to options employed both in Canada and elsewhere.

Table 2 illustrates various tools that have been employed. Several are described more fully in Appendix B, A selection of Infrastructure financing tools, while options closely related to housing-enabling infrastructure are described following Table 2.

TABLE 2

Financing tools and characteristics

Financing tools	Characteristics
Financing vehicles recommended for use in Canada	Financing options that achieve this Paper’s four objectives: (1) financing infrastructure over its useful life; (2) all beneficiaries contribute, over time; (3) sharing municipal risk; and, (4) facilitating small municipality project financing.
Municipal Services Corporations (MSCs)	Arm’s length municipal corporations and utilities; if some cases, they can be non-recourse borrowers; energy-service corporations (ESCOs) are a variant
Development Corporations	Arm’s length municipal or statutory corporations, with both borrowing and development-control powers; can be non-recourse (off-balance sheet) borrowers
Tax-increment Financing (TIF)	Redevelopment adds value and generates additional taxes; additional taxes fund infrastructure and debt-service
TIFs for TOD	TOD development adds value and generates additional taxes, used to fund transit and other infrastructure or debt-service
Land Value Capture (LVC)	New development is required to contribute to capital cost of higher-order transit or other infrastructure – beyond mere TIF
Benefitting Area LVC	Defined-area pays additional levy or rates for capital cost of higher-order transit or other infrastructure – beyond mere TIF
“Development rights” / access to infrastructure	Site-specific sale of development rights, zoning, density, access to infrastructure





Municipal Services Corporations (MSCs)

Municipalities in various Canadian jurisdictions have statutory provisions on which they can rely to establish a corporation to undertake a service or enterprise on behalf of the municipality.⁵⁹ These entities are commonly known as “municipal services corporations” (or MSCs), although in some provinces, they may be incorporated under business-corporations legislation or specific energy-distribution and generation legislation. Examples of the latter, municipally-owned enterprises include district energy corporations and energy-service corporations (ESCO), such as Nova Scotia’s AREA, the now-privatized EnWave, and Markham District Energy.⁶⁰ The MSC can function either as an independent entity from the municipality, with one or more municipalities as Shareholder, or as a joint venture with private investors. Another example is Halifax Water, a municipal utility, incorporated by statute, providing water, wastewater and stormwater services.

The MSC can be designed – and its board of directors appointed – with the goal of retaining full municipal ownership of the MSC as Shareholder, but not necessarily as a financial guarantor nor business operator. In some cases, there are statutory or regulatory restrictions on the sale of equity in assets transferred from the municipality to the MSC.⁶¹ Purchase of energy assets or undertaking new projects might also require the consent of provincial utility regulators.



Crucially, MSCs do not necessarily have recourse to the municipality for default on debt, so they may not be consolidated on the municipal balance sheet or included in the calculation of the municipality’s “annual repayment limit” (debt limit). Although the MSC’s success in achieving municipal borrowing rates and economical market access is not assured, MSCs have the authority to borrow, including issuing their own debt.

Regardless of their size and structure, a common feature of most of these autonomous corporations is that they are not just local boards or commissions of the municipality. In a number of cases, innovative corporate structures (such as MSCs) have been developed by municipalities to allow financing to be amortized over the useful life of the infrastructure in which they invest, without placing a debt burden

There may be non-financial reasons to create MSCs to build and operate infrastructure. For politically contentious or financially difficult decisions, like rate-setting or collective bargaining, there may be advantages to some degree of insulation from the special-interest pressure and public criticism that otherwise face municipal politicians.

on municipal corporations. There are even cases where private consortia that are seeking municipal infrastructure contracts create companies under agreements that permit equity participation by the consortium partners (e.g., Edmonton’s Valley Line).

There may be non-financial reasons to create MSCs to build and operate infrastructure. For politically contentious or financially difficult decisions, like rate-setting or collective bargaining, there may be advantages to some degree of insulation from the special-interest pressure and public criticism that otherwise face municipal politicians. MSCs can more easily recruit professional managers and pay market rates for their skills. They can also be aggregated across a number of municipalities to achieve economies of scale. MSCs have shown value in joint ventures and district energy corporations.

As noted above, when MSCs employ a commercial utility model, private investors may favour arrangements wherein a designated area pays a surcharge or royalty for the ongoing benefit of one or more infrastructure projects, or where one or more categories of infrastructure are provided to a group of municipalities (and/or neighbouring First Nations), as with CIB’s south Manitoba environmental project referenced elsewhere in this Paper.



The CIB's IHI has the advantage of attracting private capital to infrastructure investment on terms that most municipalities would find acceptable. A loan from the CIB and a private lending partner funds the cost of infrastructure to enable housing growth. The loan terms would share the risk of anticipated residential growth materializing by 'pricing-to-growth' and being repaid through dedicated revenue streams.

In addition to district energy companies, municipalities have used MSCs as the corporate vehicle to contract for private-sector transit operations or to deliver a range of environmental and network services, including wastewater, solid waste and other utilities.

Some of the more successful MSCs:

- **The municipally-owned Aquatera Utilities Inc.** in northwest Alberta, began as company to which municipalities in the Peace River district transferred their water and wastewater facilities and functions.⁶² Over time, Aquatera has grown to offer water, wastewater and solid-waste management services, as well as engineering services to municipalities across the province.
- An even more successful venture is **City of Edmonton-owned EPCOR**, which builds, finances and operates water, wastewater and energy-distribution facilities for municipalities across Canada and elsewhere in North America, paying substantial annual dividends to its sole municipal shareholder, the City of Edmonton.⁶³ (To respect the original investment by taxpayers and ratepayers, and to protect rate-stability for Edmontonians, EPCOR must make its equity returns on assets other than transferred municipal assets).
- Another example of such a corporation is **Montréal area's "Commission des services électriques de Montréal (CSDM)"**, established in 1910. All of the region's local public utilities commissions, Hydro Québec, area telecoms and the City of Montréal, jointly govern the CSDM. They annually cost-share both capital expenditures (~\$100M) and operating expenditures (~\$80M) made on their collective behalf by the CSDM within the Montréal region.
- Not all uses of the MSC are large scale. A rapidly-growing Ontario municipality, the **Town of Innisfil**, has created three MSCs: one for regulated local electricity distribution, one for unregulated energy-related business activities, and one with responsibility for water and wastewater.⁶⁴



Development corporations

Another variation on the infrastructure-building-and-financing entity is the so-called “development corporation”, used in many jurisdictions. Development corporations may be established to oversee redevelopment of neglected industrial lands, to upgrade infrastructure in declining downtowns, to revitalize ‘minority’ neighbourhoods, or to build a new urban district. They typically combine land-use planning with building and financing infrastructure. Celebrated examples include the London Docklands Development Corporation⁶⁵ in London UK, which built Canary Wharf, the London City Centre Airport and the Docklands Light Rail, as well as many housing projects. Canadian examples include Waterfront Toronto and the Calgary Municipal Land Corporation. The Calgary Municipal Land Corporation (CMLC) was created in 2007 and is funded by a Community Revitalization Levy, which is a tax-increment-financing (TIF) / land-value capture (LVC) source of revenue.⁶⁶

Private and public entities can jointly fund a redevelopment project or suite of civic infrastructure, with a view to sharing the profitability of property redevelopment, such as regenerating a derelict ‘brownfield’ site or developing a TOD precinct. Several Canadian municipalities have employed this device to promote downtown-redevelopment arena projects. Since municipalities can use land-use planning tools and expropriation to designate, acquire and consolidate lands, private partners can avoid the risks of trying to achieve those results independently. Development corporations and redevelopment authorities are most commonly used to effect urban renewal in decaying “Main Street” areas or business improvement zones (BIZs) in US inner-cities.



The Calgary Municipal Land Corporation (CMLC) was created in 2007 and is funded by a Community Revitalization Levy, which is a tax-increment-financing (TIF) / land-value capture (LVC) source of revenue.



Tax-increment Financing (TIF)

Underdeveloped “brownfields” may be saddled with environmental claims and corporate bankruptcies. Municipalities may take-on the responsibility for remediating these sites and installing better infrastructure. Alternatively, municipalities may choose to transfer that responsibility to a new private landowner or investor, with some form of indemnification related to environmental, litigation or property-title risks and liability. In addition to enhancing environmental quality in the community, these sites are often centrally located and proximate to good infrastructure. As result, the case is made that the restored site would increase in worth and see redevelopment, and with that rise in value, the site would be eligible to pay much higher property taxes and local business taxes.

For “brownfields” sites, a common practice is employing so-called tax-increment financing or TIF. Under a local TIF regime, the net-new, post-development taxes paid in a designated area are used, in whole or in part, to reimburse the cost of site-remediation and upgraded infrastructure, until those accumulated costs are discharged. For larger sites or whole redevelopment districts, infrastructure bonds may be issued and the TIF levies used to service the debt.



Capstan Light-Rail Station in Vancouver took nearly a decade to accumulate the relatively modest sum of \$31.5 million, to partially defray the \$52 million cost of the station.

TIFs are a time-limited allocation of the portion of property tax that is in excess of the amount of property tax the properties were liable to pay prior to the redevelopment of a ‘brownfield’ site, a lower-order property use, or an area designated for redevelopment. Since TIFs alter the normal application of tax law, municipalities in some provinces use grant provisions in municipal legislation, rather than directly altering the effect of tax law.⁶⁷ A variation of the TIF model has been employed to fund new transit infrastructure from the increased tax revenues created by access to higher-order transit, with its benefits and shortcomings illustrated in the following Vancouver example: Relying on property value appreciation over time can mean revenues arrive long after the financial outlay to build the infrastructure. The experience of the Capstan



Light-Rail Station in Vancouver illustrates this point: it took nearly a decade to accumulate the relatively modest sum of \$31.5 million, to partially defray the \$52 million cost of the station.⁶⁸

Accumulating funding as a pre-condition for building infrastructure can mean worthwhile infrastructure is delayed or “mothballed”. Likewise, the time-scale to realize returns using TIF measures can be very long.

To provide an indication of the scale of funding raised through TIF arrangements, in Calgary since 2007 the City has invested \$396 million in infrastructure in the large downtown east River District, unlocking nearly \$3 billion of investment in the area. It is estimated that the progressively increasing uplift in tax revenue collected over the course of the 40-year term of the TIF arrangement will be sufficient to fund the ongoing infrastructure investments and placemaking initiatives to complete the project.⁶⁹

But this municipal finance constraint may be overcome and represents a unique opportunity for “patient” capital.

A broader use of TIFs for TOD and “Main Street” housing infrastructure

Redevelopment proposals that move away from tried-and-true models of housing and urban design create uncertainty and market risk in the minds of developers and their financial backers. This is another area where risk-sharing could make a contribution to building infrastructure to support housing.

As long time Carmel, Indiana, Mayor Jim Brainard explains, one of the main (often hidden) obstacles to developers agreeing to modify their plans can be their bankers and investors. By demonstrating success, that reservation can be overcome. In Carmel, TIFs were used on 60 occasions to allow higher post-development taxes to fund the cost of better urban designs, mixed-use and medium-density residential projects, less car-dependent and denser urban designs, and more efficient use of housing-enabling infrastructure.⁷⁰





Across North America, even when successful, redevelopments often yielded only a modest net increase in property taxes, so the TIF paid for site remediation but net tax gains were low. As Carmel demonstrates, however, TIFs can encourage conversion of low-tax-yield uses, like surface parking and strip-plazas, to high-yielding medium-density mixed-use developments of housing and businesses. Medium-density uses yield many multiples of predecessor annual property taxes. They also allow the municipality to reduce the space-extensiveness of its infrastructure requirements and increase the operational efficiency of that infrastructure.

TIFs can encourage conversion of low-tax-yield uses, like surface parking and strip-plazas, to high-yielding medium-density mixed-use developments of housing and businesses.





Land value capture

A somewhat more promising use of the TIF concept is so-called “land-value capture” (LVC), which moves beyond simply enhanced property and business tax revenues to ‘capture’ enhanced land value and/or business expansion and commercial revenues. (In their 2023 research study for the University of Toronto’s School of Cities, sponsored by CIB, Matti Siemiatycki, Drew Fagan and Robert Nutifafa Arku outlined the potential for LVC, citing a variety of domestic and foreign examples).⁷¹

One of the ironies of building major housing-enabling infrastructure projects is that – with the exception of land-fill sites – they usually make the properties they serve and the land around them much more valuable for both residential and commercial development. But the public does not directly benefit financially from its tax-supported investment. Those who own these infrastructure-enhanced lands, or who have optioned them in anticipation of upgraded zoning and infrastructure, reap a significant increase in wealth.

Other than more tax revenue (most of which is federal or provincial, rather than municipal),⁷² the public does not share the financial gains realized by adjacent land owners as a result of public infrastructure investment. Post-construction municipal infrastructure cost-recovery efforts based on higher taxes or higher densities do not usually match the public’s financial outlay to acquire necessary property rights and to build the infrastructure. Since property taxes are typically only a small fraction of the value of the properties against which they are levied, the amortization of LVC measures, much like TIF bonds, must usually extend over decades or the useful life of the infrastructure, or be supplemented from other sources.



If recent experience is any guide, much of the new housing anticipated across Canada will be high-density in form and often located near public transit hubs. As explained earlier, transit-oriented development or TOD often requires significant upgrading of existing infrastructure to support greater volume of use and increasing local population. These infrastructure projects are excellent candidates for LVC measures.

To recover some of their housing-enabling infrastructure costs, municipalities may use one of several models of “land-value capture” (LVC). LVC’s revenue-generating potential can also be instrumental to making more viable investments by governmental infrastructure-financing entities and private investors. Municipalities (or provinces/territories) may structure a special levy for a designated precinct, or make access to infrastructure conditional on payment of a fee, or sell the development rights on, around or above its own lands. One of the most attractive and sustainable approaches to LVC is one that is based on a risk-sharing, long-term perspective.

The recognition that LVC could be a source of revenue for the public has occasionally caused policy-makers to exaggerate its potential. It has been suggested that LVC revenues could reimburse the cost of public infrastructure, offset the cost of building affordable housing, help to fund other public amenities or “community benefits”, and achieve a range of additional public policy objectives. In some instances, municipal, provincial or federal financing entities may be prepared to absorb some diminution in their financial returns, if LVC can leverage those outcomes.⁷³

Realistically, however, there is only so much public authorities can siphon-off before a redevelopment project loses its economic attractiveness or generates taxpayer opposition. In other words, even when LVC works well, the largely one-time jump in property values can only be monetized and spent once – primarily for priority public needs, and often, only over time, through a time-limited or permanent levy.

To recover some of their housing-enabling infrastructure costs, municipalities may use one of several models of “land-value capture” (LVC). LVC’s revenue-generating potential can also be instrumental to making more viable investments by governmental infrastructure-financing entities and private investors.



There are, however, LVC measures that prove to be material contributors to the cost of public infrastructure, both for “greenfields” and for “intensification” (e.g., TOD projects or “brownfields” remediation). They generally fall into three categories: (1) a special tax or utility levies on benefiting owners/ occupants of nearby lands; (2) the sale of development rights and/or special access to infrastructure; and, (3) joint development ventures involving municipal and private entities.

One-time, up-front LVC payments may be suitable in some instances (e.g., zoning-density “bonus” payments; for rapid transit access and/or adjacent development rights; or, as part of a TOD development agreement).

Tax-increment financing (TIF) has a track-record of producing modest but compensating net revenues covering the cost of basic infrastructure upgrades. For more comprehensive and sustainable funding arrangements over time, an LVC model involving a supplementary capital levy on a new development or development precinct has much to recommend it. This LVC approach imposes an ongoing supplementary charge, either through property taxation (or a “royalties” variant) or through a capital surcharge on utility rates. The net revenues from LVC charges are then used to cover debt-service costs on infrastructure debt or to fund an extension of infrastructure.

In imposing specific LVC levies, the high cost and general community benefit of infrastructure should be acknowledged, as well as the practical need to preserve housing affordability. There would therefore likely be merit in a LVC structure that shares the gross cost of new infrastructure over time between, on the one hand, direct beneficiaries and, on the other hand, the general residential and business property tax base and the utility rate-base. This allocation practice is followed under development-charges legislation in some provinces.



Benefitting area LVC

Traditionally, one of the most common examples of “benefitting area” LVCs was the “local improvement” project or the water-services “benefitting area”, under which properties were provided new municipal services and infrastructure in exchange for paying a special tax levy on their property or a surcharge on their utility rates.

The more substantial and innovative form of LVCs elevates the scale and financial yield. A supplementary, permanent tax levy is imposed on property-owners and businesses in a defined area deemed to be benefitting from enhanced property values created, in part, by the addition of some higher-order municipal infrastructure (e.g., rapid transit terminal or expressway interchange). An older, more straightforward model is charging a “frontage fee” or tax to recover the cost of linear infrastructure, like water lines or new sidewalks.

A common example of large-scale LVCs is the effort to cover some of the cost of expensive rapid transit infrastructure from property owners adjacent to the line and in particular, near rapid transit stations.

In London UK, the new cross-city ~\$25 billion “Elizabeth Line” subway imposes a complex special levy on major business owners (“Business Rate Supplement” or BRS) in a designated adjacent area, aiming to generate ~£4 billion, since the enhanced value of adjacent properties was eventually calculated at 55%.⁷⁴

The Elizabeth Line’s BRS format has been emulated by CDPQ for its recently completed South Shore rapid transit line in Montréal, known by its French acronym REM. The REM LVC imposes a so-called “royalty” on owners of business properties along the length of the rapid-transit right-of-way, aiming to “share” the increased property values and profitable commercial activity generated by the new rapid-transit line.⁷⁵ The model is now being considered for replication on other Québec rapid transit lines.



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Sale of “development rights” and special access to infrastructure

Another variation of LVC is the sale of “development rights”, which are made much more attractive as a direct result of public infrastructure investments and related rezoning. Pioneered by Hong Kong’s Transportation authority (MTR)⁷⁶ and later by the Netherlands railway authority, this approach was also used on London’s Elizabeth Line. Transport for London (TfL) had acquired property adjacent to new “Underground” stations and entered into joint redevelopment agreements with commercial property developers.⁷⁷



US\$25 billion Hudson Yards redevelopment on the west side of Manhattan used the proceeds from the new development (taxes, rents and commercial revenues) to pay-off City of New York bonds issued to finance the 7 Subway Line extension and to build the Hudson Yards subway terminal.

While many Canadian cities have used “density bonuses” from up-rezoning to generate additional revenue for local infrastructure and other amenities, an LVC approach contributing to more housing is perhaps best illustrated by two projects led by Canadian municipal pension fund OMERS.

The vast, ultimately US\$25 billion Hudson Yards redevelopment on the west side of Manhattan used the proceeds from the new development (taxes, rents and commercial revenues) to pay-off City of New York bonds issued to finance the 7 Subway Line extension and to build the Hudson Yards subway terminal, which transit infrastructure made the overall development economically viable.⁷⁸

The OMERS’s realty arm, Oxford Properties, paid A\$369M to purchase of “air rights” over the new Gadigal Metro Station in Sydney Australia, in order to construct the large, purpose-built rental housing complex known as “Indi Sydney”.⁷⁹



Measures to Close the Housing-enabling Infrastructure Gap



Measures to Close the Housing-enabling Infrastructure Gap

To close the infrastructure gap there are four measures that – alongside traditional forms of investment – can support municipalities in accelerating housing-enabling infrastructure delivery.

Managing the risks of building housing-enabling municipal infrastructure

Based on the foregoing research findings, there would appear to be several primary risks facing municipalities as they look to provide housing-enabling infrastructure.

Several primary risks facing municipalities:

- The cost of infrastructure to serve 5.8 million new homes over the next decade exceeds anything existing municipal fiscal arrangements could support;
- Those who will benefit from the use of infrastructure over time have often not been asked to pay directly for its cost and will resist doing so;
- The municipal fiscal considerations have made many Canadian municipalities reluctant to pay for new infrastructure over time;
- The majority of Canada’s municipalities are small, with real infrastructure needs but with limited financial resources and challenging risk profiles.

To address these risks, four practical measures might be considered:

- Moving from pre-payment to secured-payment: Amortizing the cost of long-life infrastructure
- Ensuring beneficiaries contribute to infrastructure’s cost: Beneficiary-pay and Land Value Capture models
- Reducing municipal infrastructure financial risk: a private-sector role in municipal infrastructure finance, including municipal services corporations and development corporations
- Infrastructure finance for small, rural and remote municipalities





Moving from pre-payment to secured-payment: Amortizing the cost of long-life infrastructure

Financing infrastructure over time

Many of the financing models adopted by municipalities to pre-pay for growth-related infrastructure implicitly ignore the reality that infrastructure has a long productive life. The benefits of infrastructure's use are enjoyed over that same long time-frame: not just by the initial users, but often by subsequent generations.

After allowing for minor and marginal price-discounting for social-policy considerations, those who enjoy the benefits of long-life infrastructure should reasonably make a financial contribution towards the cost of its construction, operation, maintenance and refurbishment, through taxes and rates, whether directly or indirectly.

Canadians employ this logic when buying a home. Only the wealthy or those selling another home typically pay the whole price in cash. Homes last decades and cost several times the average annual household income. Home purchasers rationally take-out mortgages to spread the cost over time, thereby making home-ownership attainable when it is needed. Logically, long-lived, expensive infrastructure to support housing should be treated the same way.

With infrastructure, however, it is too often politically and fiscally more convenient to demand that the full cost of growth-related infrastructure be paid up-front, in many cases even before the infrastructure itself is built. Ironically, that approach is not applied to infrastructure that serves existing residents and businesses. When councils refurbish existing infrastructure or re-build a road or an arena, they often finance them using long-term borrowing via debentures, amortizing the cost over a decade or more. The rationale is that the infrastructure will be used by residents and businesses over time, so taxpayers should pay for it over time.

Much of Canada's suburban civic infrastructure was built in the 1970s or after, when interest rates were much higher, thus arguing for pre-development levies rather than debt. But times have changed. While no-longer at low pre-COVID levels, interest rates and borrowing costs are now in a stable, manageable range – and infrastructure investment is needed to build homes and communities.





Private-sector investors would find this secure source of debt-service revenue an incentive to invest, since the revenue source is an assured flow-through payment from the property taxpayer to the municipality to the investor.

Financing infrastructure over time now makes a great deal of fiscal sense, although such a policy change has local political risks in some jurisdictions.

One option that most municipalities in Canada have available to them is so-called **capital levies**. Like a mortgage, capital levies are charges registered against the property being serviced by a specific suite of infrastructure. They may also be imposed on all the properties in a designated benefitting area, whether those properties enjoy the benefits of the infrastructure now or later.⁸⁰ They could be employed to top-up revenue from the municipal capital budget or from developer-paid infrastructure levies. (To make the terminology clear, these ‘capital levies’ are not the budgetary attributions for infrastructure or capital projects, which commonly form part of municipal capital plans). Capital levies can be paid-down over time, ‘commuted’ by the property owner wanting to discharge the ongoing tax obligation, or paid-out on property transfer to remove the tax-encumbrance on title. Even where some form of lot-levy or development charge regime already exists, the courts appear to countenance the imposition of a capital levy on property owners to supplement capital revenue shortfalls.⁸¹

Private-sector investors would find this secure source of debt-service revenue an incentive to invest, since the revenue source is an assured flow-through payment from the property taxpayer to the municipality to the investor.



Promoting deferred-payment levies secured by property

To cope with declining development-related fees, municipalities may delay, downsize or “moth-ball” infrastructure projects, or increase taxes and fees on residents and local businesses. Some argue that many municipalities already have substantial infrastructure funding available to them, in the form of capital reserves – although most are legally restricted for use on projects on which contributions were required from developers. Ontario municipalities, for example, are sitting on accrued development-charges reserve fund balances and other accrued capital totalling more than \$30 billion.⁸² It is notable that municipalities routinely borrow from their reserves at prevailing interest rates, in order to avoid short-term borrowing from banks, and to earn investment returns for those reserve funds.

Ontario municipalities, for example, are sitting on accrued development-charges reserve fund balances and other accrued capital totalling more than \$30 billion.

Prepayment for infrastructure through development levies, accumulating reserves and front-ending schemes, all risk slowing the pace of housing construction and missing housing-supply targets. Having an assurance that any infrastructure that is built will be adequately funded is an essential criterion for municipalities. It is also entirely reasonable for infrastructure to be financed and funded, at least in part, by those who will use it and/or those who will profit from it.⁸³

If the current balances in “earmarked” reserve accounts are insufficient to fund the infrastructure projects for which they are designated, there are financing tools that could bridge that funding gap. In simple terms, if neither the development industry nor municipalities are willing to “bankroll” or ensure the cost of building infrastructure, even when the potential for eventual reimbursement is likely, other financing entities may be in a position to play the role of “banker” on front-ending schemes. Given competing capital projects, of course, all parties would need to concur on priorities.

Financing entities may also be in a position to offer municipalities financial assurances to enhance their confidence that long-term infrastructure financing and funding commitments will be met. In its Brandon (MB)-area project, CIB has used this model to shift the revenue risk from the municipality to the project investors, should debt-supporting growth take longer to materialized than originally projected.





Ensuring beneficiaries contribute to infrastructure's cost: Beneficiary-pay and Land Value Capture models

Promoting beneficiary-pay policies

Few would suggest that the cost-burden of growth-related, housing-enabling infrastructure should be transferred from developers to initial home-purchasers or renters. As noted above, there are mechanisms that could be employed to allow both developers and future users of infrastructure to pay for infrastructure over time, both directly and indirectly, during its full life-cycle. Where developers are not required to pay for all infrastructure up-front, some would argue that those who purchase homes from those developers should pay less,⁸⁴ while defraying, over time, a *pro-rata* share of the cost of the infrastructure they use.

Four factors have recently converged to make more generally acceptable the concept of having beneficiaries of infrastructure contribute more to its cost:

- Municipal fiscal pressures are forcing municipalities to increase property taxes more rapidly than the rate of inflation;
- Construction prices and the need to build costly climate-change resilience into existing and new infrastructure is driving up its cost, although resilience should mitigate the greater cost of future system failures;
- Pressure to reduce the cost of new housing and related municipal fees is shrinking the scope for pre-payment of infrastructure; and,
- There is a growing consensus favouring investing more in existing and new infrastructure, notably water, wastewater and stormwater infrastructure.

The rationale for a beneficiary-pay infrastructure-investment policy is that all **those who benefit from infrastructure over the course of its useful life should make a financial contribution towards that infrastructure.** Once a beneficiary-pay fiscal policy is adopted, moreover, it could underpin efforts **to create infrastructure-use income-streams supporting investment and to expand private financing of housing-enabling infrastructure.**

Once the concept of “beneficiary pay” is accepted, the next hurdle is deciding an equitable method to achieve that objective. Based on our analysis, it appears that LVC tools, including TIFs, have much to recommend them.





Reducing municipal infrastructure financial risk: a private-sector role in municipal infrastructure finance, including municipal services corporations and development corporations

A sustainable private-sector role in municipal infrastructure

Given fiscal realities, municipalities need a wider range of borrowing instruments, to supplement any new revenues they realize. After several years of volatile bond markets, and with increasing bank credit requirements, the US is seeing a growing market for “**commercial credit**”, i.e., private lending as an alternative to commercial bonds and bank loans. Several Canadian pension funds have allocated investment funds to this growing market. This may be a financial instrument of interest to municipalities, since it is more flexible and time-limited than debentures and more easily accommodates risk-mitigation provisions.

As noted above, when MSCs employ a commercial utility model, private investors may favour arrangements wherein a designated area pays a surcharge or royalty for the ongoing benefit of one or more infrastructure projects, or where one or more categories of infrastructure are provided to a group of municipalities.⁸⁵

Another innovation in municipal infrastructure finance would be the use of US-style “**revenue bonds**” (despite the absence of a tax-exempt benefit in Canada).

Infrastructure projects with development risk, but with a reliable projected revenue stream from payments by infrastructure users and/or from contracted municipal contributions, could be financed by revenue bonds issued by municipalities or MSCs. A trunk water line or land-fill site are potential candidates, especially if the revenue bond is structured so as to not be part of the municipality’s debt-limit (ARL) calculation.

Of equal importance, such financial innovation could achieve a broader objective: using public funds to “crowd-in” private investment in infrastructure.

When MSCs employ a commercial utility model, private investors may favour arrangements wherein a designated area pays a surcharge or royalty for the ongoing benefit of one or more infrastructure projects, or where one or more categories of infrastructure are provided to a group of municipalities.





Governments also have infrastructure policy objectives that go beyond conventional financial considerations, to allow for other investment-related benefits.

Private investment can play a part at both ends of the infrastructure financing continuum:

- During the development, construction and deployment phase, when the risks of construction-cost overruns, change-orders, scope-creep and delays are highest and therefore, borrowing can be hard to secure and expensive; and,
- During the post-implementation phase, where total project costs are known with certainty, where debt-service provisions are well established as a priority claim in municipal and utility annual operating budgets, and any projected usage-revenues can be confirmed.

Governments also have infrastructure policy objectives that go beyond conventional financial considerations, to allow for other investment-related benefits.⁸⁶ For example, as a partner in the infrastructure development process, governmental financing entities could encourage municipalities, developers and homebuilders to innovate on current practices.

Governments at all levels seek what some would call triple-bottom-line objectives, such as those in CIB's 2023 *Statement of Priorities and Accountabilities*.⁸⁷ These infrastructure-related objectives might include: district energy and co-generation; natural drainage, flood and forest-fire mitigation; 'brownfields' regeneration; alternative transportation infrastructure; Indigenous enterprise participation; and, progressive labour practices.

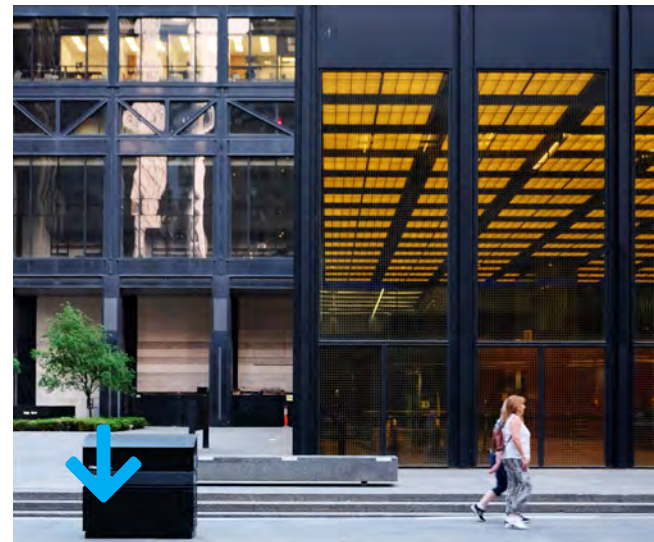


Organizations like CIB are in a position to ‘cost’ these added features for project *proformas* and potentially share some of the inherent delivery risks. They may also be able to identify ways in which these added features improve the marketing potential of new housing and/or return a dividend to co-investors and/or homeowners/renters.

A variety of investors would find municipal infrastructure an attractive investment. Once installed, infrastructure – like waterworks, transit, drainage, broadband and electricity distribution – is used on a predictable, constant basis. It is sustained by committed annual municipal budget funding, low-cost borrowing, and in some cases, supplemented with consumer revenues.

There are several impediments. Much municipal infrastructure is funded from general taxation and may not generate its own full-cost-recovery income streams. There is also significant opposition to ‘privatizing’ public infrastructure. Finally, most municipal infrastructure projects are small in both scale and dollar-value. These factors combine to dissuade the private sector from investing in public infrastructure projects. **To “crowd-in” private investment in housing-enabling infrastructure, solutions will need to be found that overcome these hurdles.**

“Patient capital” – like insurance companies, the investment arms of Schedule 1 banks, sovereign wealth funds and pension funds – may find the scale of individual infrastructure projects does not warrant the cost and effort of necessary due-diligence. However, if a ‘basket’ of infrastructure projects could be assembled, with the appropriate due-diligence and effectively spreading the risk over a number of projects and/or municipalities / MSCs, municipal infrastructure becomes more “investable”. These “bundled” investment vehicles could then be syndicated to private investors, with the foregoing obstacles being greatly reduced in the eyes of cautious investors.



For major private investment ‘platforms’, even a “basket” of investable public infrastructure projects would likely need to be valued at a minimum of \$100 million and pay a market-competitive blended investment return. There may also be need to create an element of tradeable liquidity for these otherwise largely “illiquid” investment products.



In designing these investment vehicles, it would be feasible to segregate those types of municipal infrastructure that would pass the third-party certification test of meeting ESG criteria or being designated “green”. “**Green bonds**” have been issued by a number of Canadian and American governments, including a number of large city governments, with considerable success, in terms of both demand and price relative to conventional bonds and debentures.⁸⁸

Reducing municipal risks in infrastructure financing commitments: CIB and IHI

The CIB’s IHI (described earlier) has the advantage of attracting private capital to infrastructure investment on terms that most municipalities would find acceptable. A loan from the CIB and private lending partner(s) funds the cost of infrastructure to enable housing growth. The loan terms would share in the risk of anticipated residential growth materializing by ‘pricing-to-growth’ and being repaid through dedicated revenue streams.

Ensuring infrastructure performance: alternatives to letters-of-credit

When municipalities want to ensure performance on development-approval conditions and housing-related infrastructure, they commonly use letters-of-credit to secure them.

The terms of letters-of-credit allow municipalities to draw down whenever, in their view, the homebuilder or developer has failed to meet a condition or a deadline. Since letters-of-credit are treated as a firm financial commitment by banks and other lenders, they reduce the ability of homebuilders to secure or maintain construction-financing for infrastructure and for their next residential projects.

These cash-flow considerations can add to the pressure on developers and homebuilders to leave construction-approved residential properties in an undeveloped state, rather than build infrastructure and homes in an environment where they cannot be sure to bring homes to market in a timely and profitable fashion. Loss of water and wastewater “allocations” is also strenuously resisted by developers, who claim that some allocations are for services that have yet to be built. *“There are numerous prospective developments in Ontario with servicing allocation, but without hard infrastructure available to enable development.”*⁸⁹





The homebuilding industry has proposed using surety bonds to ensure performance, since ‘performance’ bonds are a common practice in other parts of the construction industry.⁹⁰ While they may sympathize, municipalities have little incentive to increase the risk of non-performance by homebuilders, in order to improve the credit-worthiness of developers and builders. Municipalities may be justifiably wary of securing infrastructure and infrastructure financing through development interests. Those interests may be under-capitalized and litigious in a field where litigation is a common business practice.

To overcome this very real constraint on housing development, measures could be taken to risk-share with third-party guarantors, the obligation to make-good on late or lost development-related revenues or failure to install infrastructure as committed or to municipal standards.

The solution may be for municipalities to accept a “**housing-infrastructure performance bond**”, structured similar to the so-called ‘subdivision bond’. Freed from the credit restraints of letters-of-credit, homebuilders and developers would be in a position to increase their level of construction financing. This financial instrument would also help homebuilders to overcome hesitation about moving ahead with infrastructure projects in an uncertain business and market environment.

Properly structured, the “housing-infrastructure performance bond” would shield the municipality from the risk of non-performance by developers or others. It could also cover performance deficiencies during the warranty period, after the municipality accepts ownership of the infrastructure built by the developer.⁹¹ Of course, balance is necessary: a long amortization period may lower the annual cost, but it would also outlast the warranty period.



Creating utility-model Municipal Services Corporations (MSCs)

The MSC structure allows investors to make loans or to purchase equity, often without adversely affecting the debt limits or other borrowing restrictions imposed on the municipality (including self-imposed policy limits below the regulatory borrowing restrictions). Of potential interest to infrastructure investors, both private parties and municipalities can be equity investors and enjoy net revenues and enhanced asset valuations over time, as we see in some local electricity distribution companies.⁹²

Under a MSC model, the municipality may collect user rates and development levies – and then pay over to the MSC an agreed amount, to cover the amortized cost of the infrastructure, as well as for infrastructure operation, maintenance and refurbishment. In instances where the municipality or its public utility continues to operate the consumer-billing functions, the net proceeds can be routinely remitted to the MSC. Relationships between the MSC and private investors or infrastructure operators could be crafted to confer on the investor the responsibility for building and operating municipal infrastructure, funded under contract by the MSC in an “availability payment” format, or with a rate-regulated return. A self-financing utility-model MSC also has potential merit for municipalities participating in the *Housing Accelerator Fund*, the *Investing in Canada Infrastructure Program (ICIP)* and the federally-supported *Green Municipal Fund*.



Infrastructure finance for small, rural and remote municipalities

Dealing with the unique infrastructure needs of smaller municipalities

There is a material difference in the capacity of municipalities, both in depth of expertise and in fiscal resources. A minority of Canada’s municipalities have a large urban population or have a regional structure and service mandate (typically counties, regional or district governments). They have a correspondingly more robust tax base and a cadre of professional staff of various kinds, although the functions and infrastructure roles of regional and county governments vary widely.



Most of Canada’s municipalities, however, have small populations, govern small or sparsely-populated geographic areas, and have few staff – often just several dozen – devoted to providing basic community services. By way of illustration, of the 3,500 municipalities in Canada, only 27 have a population greater than 200,000 and the 25 largest contain over 44% of Canada’s total population.⁹³ On the other end of the scale, in Ontario for example, 182 of 414 municipalities (44%) have populations below 10,000.⁹⁴ Of Québec’s 1,100 municipalities, 900 have populations less than 2,000 and the ten largest make up more than half the province’s population.

In addition, the boundaries of many municipalities do not correspond to the watershed or economic region over which major infrastructure is best suited, leading to the challenges of duplicated neighbouring infrastructure, sub-optimal system designs, loss of economies of scale, and complex and occasionally contentious inter-municipal infrastructure agreements.

The infrastructure-building experience of the majority of municipalities will be limited to public works tendering processes, conventional debt-financing (issuing debentures), application-based capital grant programs, and realty-development agreements. They may be reluctant to embrace new models of infrastructure construction and financing without some confidence-building assurance against financial and political risk. Being generally unfamiliar with private-sector finance beyond the development industry, they would likely be more comfortable working with public entities, like CIB, and with ‘templated’ solutions already proven reliable by their municipal peers.

For smaller municipalities and their projects, the goal should be to design enabling-infrastructure financing arrangements that are easily accessed, require limited legal and project-financing expertise, and employ a template or format that small municipalities could utilize with confidence and understanding. CIB’s new *“Infrastructure for Housing Initiative”* (see above) is a good example.



Only 27 of Canada’s 3,500 municipalities have a population greater than 200,000.





The precedents for this approach can be seen, for example, in Nova Scotia, New Brunswick, British Columbia, Alberta and Ontario, where financial agencies:

- Make capital loans to municipalities and municipal corporations on an at-cost basis;
- Purchase or issue the debt of municipalities on terms that reflect their provinces' strong credit ratings;
- Incur debt backed by the collective credit strength of their municipalities (with the Municipal Finance Authority of British Columbia and with Ontario regional municipalities).

For small municipalities, this also avoids the cost and unfamiliarity of credit markets. After bundling these loans, the provincial agencies would have the option to go to the market for private investors in fixed income or other credit instruments.⁹⁵

The size distinction among municipalities is important for determining any financing role in support of housing-enabling infrastructure, for two reasons:

- Most additional housing will not be built in small towns or remote centres. Most additional housing will be built in larger and/or rapidly growing urban and suburban municipalities and may also be served by county or regional municipalities with a 'regional' municipal services mandate;
- The majority of Canadian municipalities will have limited experience with complex or sophisticated financial arrangements. All municipalities are wary of them (notably after the MFP financing scandals in several Canadian cities).⁹⁶



Despite these provisos, municipalities are not competitors when it comes to building and financing infrastructure. They share information and experience freely and they are very much influenced by successful innovations by their municipal peers. In the municipal world, there is a “domino” effect. Success with a few ‘proof of concept’ financing projects would attract both favourable attention and replication across the Canadian municipal world.

Success with a few ‘proof of concept’ financing projects would attract both favourable attention and replication across the Canadian municipal world.

Addressing ‘market failure’

Considerations of geography and sparsity of population, or the need to build infrastructure in advance of housing, can render infrastructure projects impractical based on marketplace economics and traditional methods of municipal funding and financing. This phenomenon is referred to as “market failure”. Correcting ‘market failure’ may call for proactive capital investment with a long-term horizon, such as the 20th century policy decisions to build otherwise-uneconomic rural electricity grids.

This rationale has also under-pinned public investment by all three orders of government and Indigenous communities in fibre-optic infrastructure and broadband micro-wave services.

The Eastern Ontario Regional Network (EORN)⁹⁷ is a good illustration. Faced with poor Internet and cell phone infrastructure in rural eastern Ontario, governments at all three levels covered the initial capital cost of the EORN infrastructure. Private and institutional telecon operators were then invited to bid on using the infrastructure on an operating-cost basis. In addition to serving rural homes, it opened the region to expanded on-line local business opportunities, while enabling public and healthcare institutions to serve citizens in remote locations. This model was also used by county governments (MRCs) in rural Québec.

Particularly for small and rural municipalities, “patient capital” may be able to finance the foundational infrastructure (waterworks, district energy companies, decarbonized fleets, affordable housing projects, etc.) on which a viable infrastructure business could be built, and from which initial investors could be reimbursed over time.



Conclusion



Conclusion

Building housing-enabling municipal infrastructure on an accelerated basis is essential to increasing the supply of housing across Canada. In fast-growing parts of Canada, the cost of providing a full range of infrastructure likely exceeds \$100,000 per home over time. Investment of that scale exceeds the financial capacity of the municipal sector, which owns and operates the majority of public infrastructure. It will require a considerable long-term investment by both the public sector and the private sector. It is a daunting but necessary venture and like some Canadian winter journeys, it may require a “jump start”.

This paper proposes four measures that should improve Canada’s prospects for achieving our housing-enabling infrastructure needs:

- Moving from pre-payment to secured-payment for infrastructure over its useful life;
- Ensuring all beneficiaries contribute to infrastructure’s cost throughout its life-cycle;
- Reducing municipalities’ infrastructure financial risk and limitations by using innovative financial models and private capital while keeping infrastructure in public ownership, and;
- Tailoring infrastructure financing models to the fiscal risks and realities of Canada’s small, rural and remote municipalities.



Appendices

Appendix A: Infrastructure types and categories

TABLE 3

Infrastructure types and categories

	Infrastructure Category 28 current municipal responsibilities, plus potential future infrastructure roles	Local On-site Infrastructure	Community Neighbourhood Infrastructure	District Trunk, municipality- wide, watershed infrastructure
1	Roads/bridges/tunnels/alt. transportation	X	X	X
2	Sidewalks/streetlighting/ hydrants	X		
3	Parking facilities/ collection/ traffic control		X	
4	Public Transit, incl. fleet		X	X
5	Rapid Transit – LRT, BRT, subway			X
6	Airports/marinas/harbours			X
7	Police/Fire		X	X
8	Emergency Medical Services / Land ambulance		X	X
9	Potable water	X	X	X
10	Wastewater	X	X	X
11	Stormwater/drainage	X	X	X
12	Water conservation/re-use/ rural irrigation/ ‘greywater’ systems		X	X
13	Arenas/recreation/culture/ libraries/parks/heritage		X	X
14	Local energy distribution			X
15	Local energy generation / co-gen			X



Infrastructure Category		Local	Community	District
28 current municipal responsibilities, plus potential future infrastructure roles		On-site Infrastructure	Neighbourhood Infrastructure	Trunk, municipality-wide, watershed infrastructure
16	Energy conservation – municipal / utilities			X
17	Energy transition – community		X	
18	Energy transition – municipal/district energy			X
19	Solid waste collection – fleets	X	X	X
20	Solid waste disposal – sites and remediation			X
21	Waste-recovery, recycling, energy-from-waste		X	X
22	Indigenous-municipal services enterprises			X
23	Administrative facilities			X
24	Broadband networks	X	X	X
25	Shelters, emergency housing			X
26	Long-term care homes			X
27	Social Housing/public housing			X
28	Hospitals/clinics			X
29	Potential new infrastructure roles (decarbonization, sustainability, etc.)	X	X	X

Appendix B: Infrastructure financing tools



Tax-exempt municipal bonds (‘munis’) and public activity bonds (PABs)

Across North America, municipalities traditionally use general obligation bonds or debentures to fund their capital programs. In Canada, the interest earned on municipal debentures is taxable in the hands of taxable investors. In the United States, the interest earned on municipal bonds – called “munis” – is tax-exempt. In recent years, the tax-exempt status of US municipal bonds has been widened to include bonds issued for private companies undertaking “public activities”, or issued by municipalities on their behalf those companies. These latter instruments are known as “public activity bonds” or PABs.

The contrast between Canada and the US is striking. The US\$3.8 trillion municipal bond market sees debt issuance in excess of US\$400 billion each year. Although Canada is 10% of the size of the US, the Canadian municipal bond market universe is less than 1% of the size of the corresponding US marketplace, or a mere C\$35 billion. Canada sees less than C\$5 billion in municipal debenture issues annually.⁹⁸

A distinguishing feature of many tax-exempt bonds is that they are project-specific and funded from a dedicated revenue source. There have been recurrent calls for Canadian municipalities to be given the authority to issue tax-exempt bonds,⁹⁹ with little positive reaction to date from the governments.¹⁰⁰

Revenue bonds

As an alternative to general obligation municipal debentures, some jurisdictions allow bonds to be issued for specific projects, provided that those bonds are both secured with a priority claim on the resulting infrastructure asset by investors, and repaid from revenues generated by the infrastructure they make possible (or from some other independent revenue source, like “earmarked” State lottery proceeds funding sports stadiums). Because municipalities and provinces/States have better credit ratings than most private corporations, efforts are often made to structure revenue bonds to be lower-cost public bonds. Properly structured, they may not be counted as “burdensome” debt for purposes of the municipality’s “annual repayment limit” or ARL, although this is not always achievable within existing accounting rules, as with the P3 project debt on Edmonton’s Valley Line.

Revenue bonds are based on the simple concept of building and paying for an infrastructure project from the revenues it will generate.



- A local water or wastewater line extension is built with a “local improvement” debenture, which is then repaid over time from a capital surcharge on the benefitting properties or through local water rates paid by the new customers.
- A bridge or expressway is built with the proceeds of a bond, and the debt-service on the bond is paid by tolls from vehicles using the infrastructure.

Treasury officials at all levels of Canadian government traditionally oppose “earmarked” taxes and special-purpose borrowing, in favour of preserving an unrestricted tax base and wide budget discretion. For these reasons, revenue bonds are not widely employed in Canada. Advocates for revenue bonds make the case that they can secure approval for borrowing that would not otherwise compete well politically with other capital project priorities.

Green bonds

In designing these investment vehicles, some jurisdictions segregate those types of municipal infrastructure that would pass the third-party certification test of meeting ESG criteria or being designated “green”. “Green bonds” have been issued by a number of Canadian and American governments, including a number of large city governments, with considerable success, in terms of both demand and price relative to conventional bonds and debentures.¹⁰¹



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Similar analyses of the value of infrastructure employ ‘current replacement value’ calculations drawn from municipal balance sheets and asset-management plans. Based on replacement cost of ‘book value’, the FCM’s estimates do not likely fully encompass the climate-change impacts and state-of-good-repair issues highlighted by the Financial Accountability Office of Ontario, Statistics Canada and the City of Toronto’s recent Long-Term Financial Plan (each referenced below).

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- 28 “Statistics Canada Vacant Residential Land Estimates for Toronto and Ottawa Metropolitan Areas: A Baby Step Forward”, Centre for Urban Development and Housing, Toronto Metropolitan University (Toronto: Jan. 24, 2024); <https://www.torontomu.ca/centre-urban-research-land-development/blog/blogentry73111111/> “There is a disparity between the StatCan and MGP residential land inventories for the Toronto CMA, with StatCan’s vacant land estimate being much larger. MGP estimates the vacant land inventory in the GTA to be 57,650 acres or 44% of StatCan’s 131,000 acres.” “There is an even more sizable disparity between the two estimates for the City of Ottawa. The City of Ottawa estimates its vacant land inventory to be 3,825 acres or just 4% of StatCan’s 123,000 acres.”
- 29 “Understanding municipal debt”, Ontario Ministry of Municipal Affairs & Housing (Toronto: May 25, 2022); <https://www.ontario.ca/document/tools-municipal-budgeting-and-long-term-financial-planning/understanding-municipal-debt> O. Reg. 403/02 (Debt and financial obligation limits) under the Municipal Act, 2001, S.O. 2001, c. 25; <https://www.ontario.ca/laws/regulation/020403>
- 30 The Broadbent Institute calculated that Canada’s gross domestic product would see a short-term increase of \$1.43 for each dollar spent on infrastructure. The Canada Centre for Economic Analysis (CANCEA) found that Ontario’s planned public infrastructure investment of \$130 billion would support approximately 11% of its GDP growth. On average, each \$1 billion investment in Ontario’s infrastructure would generate and support \$16.3 billion in GDP in the Province over 30 years.

In the US, Moody’s, the Congressional Budget Office and the Economic Policy Institute each looked at the range of public investment options. Their conclusions should be ‘must reading’ for decision-makers and finance ministries: infrastructure spending matched or out-performed more than two dozen alternative tax and public-program expenditures priorities; and, each dollar expended on economic infrastructure had a ‘multiplier’ effect of between 1.6 and 1.8 times.

- 31 Almos Tassonyi and Brian W. Conger, “An Exploration in the Municipal Capacity to Finance Capital Infrastructure”, SPP Research Papers Vol. 8, Issue 38, School of Public Policy, University of Calgary (Calgary: Nov. 2015), 29pp.; <https://www.policyschool.ca/wp-content/uploads/2016/03/municipal-capital-infrastructure-tassonyi-conger.pdf>
- 32 Ibid., page 1.
- 33 Ibid., page 18.
- 34 “Canadian government finance statistics for municipalities and other local public administrations”, Statistics Canada (Ottawa: Nov. 22, 2023); at: <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1010002001&pickMembers%5B0%5D=1.4&pickMembers%5B1%5D=3.1&cubeTimeFrame.startYear=2018&cubeTimeFrame.endYear=2022&referencePeriods=20180101%2C20220101>
- 35 Author’s interview with former Edmonton Mayor Don Iveson (March 12, 2024)
- 36 Tom Ayers, “Proposed local improvement bylaw meets with stiff opposition in Victoria County: Taxes could be levied for infrastructure projects if bylaw is passed”, CBC Halifax (Halifax: Oct 05, 2023); <https://www.cbc.ca/news/canada/nova-scotia/proposed-local-improvement-bylaw-opposition-victoria-county-1.6987448>
- 37 “Canada’s Core Public Infrastructure Survey: Water Infrastructure, 2020”, Statistics Canada (Ottawa: July 26, 2022); <https://www150.statcan.gc.ca/n1/daily-quotidien/220726/dq220726a-eng.htm#:~:text=In%202020%2C%20these%20public%20systems,storage%20facilities%2C%20and%20other%20assets>
- 38 “Bechtel Celebrates the Opening of Edmonton’s Valley Line Southeast”, Bechtel (Edmonton: Nov. 6, 2023); <https://www.bechtel.com/newsroom/press-releases/bechtel-celebrates-the-opening-of-edmonton-valley-line-southeast/> “Edmonton announces opening of Valley Line Southeast LRT”, ReNew magazine (Edmonton: October 25, 2023); <https://www.renewcanada.net/edmonton-announces-opening-of-valley-line-southeast-lrt/>

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- 41 Brian Lewis, “Practical Advice for the Ontario Infrastructure Bank”, C.D. Howe Institute (Toronto: Feb. 26, 2024); <https://www.cdhowe.org/intelligence-memos/brian-lewis-practical-advice-ontario-infrastructure-bank>
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- 50 Barara Shecter, “Why the Liberals’ ‘dangerous’ pursuit of Canada’s pension billions keeps falling flat”, Financial Post (Toronto: March 14, 2024); <https://financialpost.com/feature/why-liberals-pursuit-canada-pension-billions-keeps-falling-flat>
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- 57 Michael Fenn, “Rebuilding Sustainable Communities: The Limited Dividend Company for Delivery of Critical Infrastructure”, Canadian Government Executive, Vol. 26, Issue 03, (E. Gwillimbury ON: July 2020), pp.10-11; https://canadiangovernmentexecutive.ca/dig/26_03/10/
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- 59 Ontario Regulation 599/06; For example, this Ontario Regulation allows share-capital MSCs to sell equity to private parties. <https://www.ontario.ca/laws/regulation/060599>
- 60 AREA (a 100% municipally-owned company formed in 2014 by the Nova Scotia towns of Antigonish, Berwick and Mahone Bay): <https://www.areans.ca/about-us/>; EnWave (co-founded and formerly 42% owned by the City of Toronto); Markham District Energy (a thermal energy utility owned by the City of Markham).
- 61 Ontario Regulation 599/06, section 18 (5), bans MSCs from transferring water, wastewater and some recreation assets/ facilities to the private sector.
- 62 Aquatera Utilities Inc.: <https://www.aquatera.ca/who-we-are>
- 63 EPCOR: <https://www.epcor.com/about/who-we-are-what-we-do/corporate-governance/Pages/default.aspx>
- 64 InnServices: <https://innservices.co/about-us/municipal-services-corporation-for-water-and-wastewater-services>
- 65 London Docklands Development Corporation: https://en.wikipedia.org/wiki/London_Docklands_Development_Corporation
- 66 The Calgary Municipal Land Corporation (CMLC): <https://www.calgarymlc.ca/about> Created and owned by the City of Calgary, CMLC has a mandate to achieve the City’s objectives for urban densification and community renewal, infrastructure investment and placemaking. CMLC manages land and infrastructure investments to optimize financial returns and to enable long-term social, environmental and community resilience. The City of Calgary created CMLC in 2007 to kick-start Calgary’s urban renewal by revitalizing the Rivers District (504 acres on downtown’s east end, including East Village and Calgary’s emerging Culture + Entertainment District).
- In 2007, CMLC implemented the community revitalization levy (CRL), the first “land-value capture” funding approach of its kind in Canada. As Rivers District redevelopment proceeds, a progressive increase in property tax revenue in the District is anticipated to generate sufficient CRL dollars to complete the CMLC’s infrastructure improvements and placemaking initiatives in The Culture + Entertainment District, East Village and the rest of the District. The CRL is in effect until 2047.
- 67 Matti Siemiatycki, Drew Fagan and Robert Nutifafa Arku, “Land Value Capture Study: Paying for Transit-Oriented Communities”, School of Cities: Infrastructure Institute, University of Toronto (Toronto: April 2023), 49pp.; <https://infrastructureinstitute.ca/wp-content/uploads/2023/04/CIB-Land-Value-Capture-Study-April-2023.pdf> page 13: “For instance, in Ontario and British Columbia, density bonuses are permitted, but the funds must be used for local amenities rather than citywide projects. Tax increment financing is permitted by provincial legislation in Alberta, Manitoba, and Ontario, but in Ontario it requires specific provincial approval and has not yet been used.” The City of Hamilton ON uses “tax increment grants” (TIGs) as a work-around to address this gap in tax legislation.



- 68 Siemiatycki, et al., Pg. 26.
- 69 Ibid., page 25.
- 70 “This Is the Best Designed Suburb in America”, Shortcut Documentaries (YouTube: Dec. 23, 2023); <https://m.youtube.com/watch?si=pwflzIQW2H8brFMw&v=XRKdDqcTocA&feature=youtu.be>
- 71 Op.cit., Siemiatycki, et al.
- 72 CANCEA estimated that for every \$1 billion invested in Ontario’s public infrastructure, \$1.7 billion in provincial tax revenue will be generated (more than repaying the cost of the initial investment) and \$1 billion investment in Ontario’s infrastructure is estimated to generate a further \$1.6 billion in federal revenues. “Investing in Ontario’s Public Infrastructure: Improved Economic Evaluation of Benefits and Risks”, CANCEA Bulletin #3, Canadian Centre for Economic Analysis (Toronto: December 2, 2015), page 12. Found at: <https://beta.cancea.ca/wp-content/uploads/2022/11/Investing-in-Ontarios-Public-Infrastructure-A-Prosperity-at-Risk-Perspective.pdf>
- 73 Steven Robins, Canada Infrastructure Bank, “*Moving the Needle: How Tangible Measurement Can Ensure Infrastructure Delivers on Government Policy*”, Canadian Council on Public-Private Partnerships Annual Conference (Toronto: Nov. 13, 2023). “For us, we think about putting impact measurement at the core of our returns,” said Robins. “When we invest, we’re not investing solely for financial return. We’re looking to get a greenhouse gas reduction outcome, homes connected to broadband, new transit ridership, outcomes we feel we do need to measure to justify putting our capital at risk.”
- 74 Martin Buck, “Crossrail project: finance, funding and value capture for London’s Elizabeth line” Civil Engineering, ICE Publishing (London UK: June 19, 2017); <https://learninglegacy.crossrail.co.uk/wp-content/uploads/2017/09/1C-002-Finance-Funding-and-Value-Capture.pdf> ; “The Guardian view on taxes: high time landowners paid their fair share”, The Guardian (London: May 27, 2022); <https://www.theguardian.com/commentisfree/2022/may/27/the-guardian-view-on-taxes-high-time-landowners-paid-their-fair-share>
- 75 Op.cit., Dr. Philippe Couillard, “Building Public Transit Infrastructure: The REM Experience in Montréal”.
- 76 Hong Kong MTR Corporation (mass transit railway); https://www.td.gov.hk/en/about_us/history_of_transport_department/index.html
- 77 Op.cit., Siemiatycki, et al., pages 15-16 (Hong Kong) and pp. 17-20 (Elizabeth Line).
- 78 Hudson Yards and Seven Subway and Terminal; [https://en.wikipedia.org/wiki/Hudson_Yards_\(development\)](https://en.wikipedia.org/wiki/Hudson_Yards_(development)) and https://en.wikipedia.org/wiki/7_Subway_Extension
- 79 Oxford Properties website, at: <https://www.oxfordproperties.com/news/oxford-and-investa-top-out-sydney-citys-first-purpose-built-btr-tower>
- 80 An example is the capital levies provisions in the Municipal Act (Ontario), Part XII, sections 390-398; <https://www.ontario.ca/laws/statute/01m25>
- 81 Andrew Jeanrie and Vanessa Colton, “Builder Beware: Ontario Court of Appeal Allows Multiple Municipality Infrastructure Charges”, Bennett Jones blog (Toronto: November 25, 2022); <https://www.bennettjones.com/Blogs-Section/Builder-Beware-Ontario-Court-of-Appeal-Allows-Multiple-Municipality-Infrastructure-Charges>

“The Court of Appeal first analyzed the issue of whether the City was obligated to pass the Impost By-law under the more specific power of DCA [Development Charges Act (Ontario)], rather than the broad powers in the MA. The Court of Appeal found that the City has multiple sources of power to impose fees to recover capital costs and that it is not compelled to rely on the DCA. This is evidenced by the broad language in s. 391(2) of the MA, which encompasses charges and fees to recoup all capital costs payable by the municipality. Furthermore, the Court of Appeal highlighted that the legislative history of the MA and the DCA made it clear that the legislative intention was to create a dual regime to recover capital costs whereby the City could pass by-laws under its choice of statute. For example, s. 2(1) of Fees and Charges, O. Reg. 584/06 specifically contemplates the situation where a municipality could impose the same fee twice and prohibits such “double-dipping”.”



- 82 Op.cit., “An Overview of Municipal Budgets and an Estimate of the Financial Impact of the COVID-19 Pandemic”, Financial Accountability Office of Ontario, pg. 2.
- 83 Prof. Andrew Sancton, “Putting a Lid on Development Charges”, Intelligence Memos, C.D. Howe Institute (Toronto: Dec.9, 2022); https://www.cdhowe.org/sites/default/files/2022-12/IM_Sancton_2022_1209.pdf
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- 85 Investment commitments have been made to the Red-Seine-Rat (RSR) Wastewater Co-operative in Manitoba, comprised of the Rural Municipality of Taché, Rural Municipality of Hanover, Rural Municipality of Ritchot, Town of Niverville and City of Brandon.
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- 87 “Statement of Priorities and Accountabilities – Canada Infrastructure Bank”, Office of the Minister of Housing, Infrastructure and Communities (Ottawa: September 2023); <https://www.infrastructure.gc.ca/CIB-BIC/letter3-lettre3-eng.html>
- 88 “Green Bond Newsletter: 2023”, City of Toronto; “On December 14, 2022, the City successfully issued another C\$300 million green bond. The bond was priced to yield 4.419 per cent with a December 14, 2042 maturity...The issue was over-subscribed with orders from 32 domestic and international investors.” <https://www.toronto.ca/wp-content/uploads/2023/08/8ead-DS-23-0195-2023-Green-Bond-NewsletterFINAL.pdf>
- 89 “Use it: Optimizing Municipal Development Pipelines: A Review of the Need for and Implications of Prospective New “Use It or Lose It” Policies in Ontario”, (pg. 35) Keleher Planning & Economic Consulting Inc. for BILD and OHBA (Milton ON: Feb. 2024), 55pp.; <https://www.bildgta.ca/wp-content/uploads/2024/02/FINAL-Use-It-Optimizing-Municipal-Development-Pipelines-February-2024.pdf>
- 90 Mike Naples, “Subdivision Bonds v. Letters of Credit”, Masters Insurance Limited (Vaughan ON: November 16, 2020), 17 pp. [Prepared for Hamilton Development Industry Liaison Group (DILG)]; <https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=273705>
- 91 In Ontario, legislation was enacted to enable the Minister to expand the scope and type of sureties by regulation: *More Homes for Everyone Act, 2022*. *The Ontario Homebuilders Association asked for the regulation to make acceptance of surety bonds mandatory; the Association of Municipalities of Ontario has called for their use at the option of the municipality*. “More Homes for Everyone: AMO’s Submission to the Ministry of Municipal Affairs and Housing”, Association of Municipalities of Ontario (Toronto: April 27, 2022); <https://www.amo.on.ca/sites/default/files/assets/DOCUMENTS/Submissions/2022/AMO%20More%20Homes%20for%20Everyone%20Submission%20to%20MMAH%202022-04-27%20RPT.pdf>
- 92 Although in some provinces, there are restrictions on private ownership of existing municipal waterworks. For example in Ontario, O. Reg. 599/06, under the Municipal Act, 2001, S.O. 2001, c. 25, section 18 (5); <https://www.ontario.ca/laws/regulation/060599#BK13>
- 93 “Canada’s fastest growing and decreasing municipalities from 2016 to 2021”, Statistics Canada (Ottawa: Feb. 9, 2022); <https://www12.statcan.gc.ca/census-recensement/2021/as-sa/98-200-x/2021001/98-200-x2021001-eng.cfm> “As of 2021, there were 27 municipalities in Canada, all located within the country’s large urban centres, with more than 200,000 inhabitants and the top 25... municipalities have a combined population of over 16 million people, representing 44.1% of the total population living in Canada.”



- 94 “Ontario Municipalities”, Association of Municipalities of Ontario (Toronto: 2024); excluding the population ‘double-counting’ of the 30 “upper-tier” municipalities, from the total of 444 for the Province. <https://www.amo.on.ca/about-us/municipal-101/ontario-municipalities>
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- 96 The Honourable Madam Justice Denise E. Bellamy, Commissioner, “Toronto Computer Leasing Inquiry; Toronto External Contracts Inquiry”, City of Toronto (Toronto: 2005); https://www.toronto.ca/ext/digital-comm/inquiry/inquiry_site/report/pdf/TCLI_TECI_Report_Executive_Summary.pdf
- 97 “Improved Connectivity for Today and Tomorrow”, Eastern Ontario Regional Network (Sept. 2020); https://www.eorn.ca/en/projects/resources/Documents/EORN_AboutEORN2020_2.pdf
- 98 “Canadian Municipalities Primer - Version 2.0”, RBC Debt Capital Markets (Toronto: April 2018); found at: <https://www.rbccm.com/assets/rbccm/docs/news/2018/18-050a-dcm-2-canadian-municipalities-primer.pdf> and, James Chen, “Municipal Bond”, Investopedia (New York City and Edmonton AB: Jan. 04, 2022); found at: <https://www.investopedia.com/terms/m/municipal-bond.asp>
- 99 Resolution of Ontario Big City Mayors Caucus (Feb. 9, 2024); at: <https://www.ontariobigcitymayors.ca/wp-content/uploads/2024/01/Item-9b-OBCM-Motion-Municipal-Infrastructure-Bonds-in-Ontario-.pdf>
- 100 Michael Fenn, «More Affordable Infrastructure: Tax-Free Municipal Bonds», StrategyCorp Institute of Public Policy and Economy (Toronto/Ottawa: August 2022), 16pp.; <https://strategycorp.com/wp-content/uploads/2023/04/SCI-Institute-More-Affordable-Infrastructure-Tax-Free-Municipal-Bonds-Aug-2022.pdf>
- Podcast: <http://podcast.strategycorp.com/episode-50-a-fresh-look-at-tax-free-municipal-bonds> ;
- Michael Fenn, “*Unlocking affordable infrastructure through tax-free municipal bonds*”, The Hill Times (Ottawa: Nov. 30, 2022). <https://www.linkedin.com/pulse/more-affordable-infrastructure-tax-free-municipal-bonds-michael-fenn-2c/?trackingId=v2N%2FrZNwqSmRG4yFcPeVMg%3D%3D>
- 101 Op.cit., “Green Bond Newsletter: 2023”, City of Toronto.





Canadian Institute
Urban Institute
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Canada