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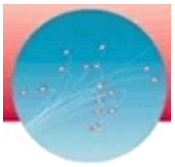

Connecting Capital to Sustainable Infrastructure Opportunities

White Paper for Sustainable Infrastructure Symposium

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Table of Contents

Introduction

Infrastructure touches every aspect of our lives. A well maintained public infrastructure system is essential to the economy and well being of a country. A significant portion of Canada's current infrastructure was built during the post World War II period, between the 1950s and 1970s. With an expected utility period of approximately 40 to 50 years, Canada's infrastructure is showing signs of age and decline. Today, both the infrastructure and the institutional framework that funds and finances these assets in Canada are in need of repair.[1] Michael Fenn aptly notes that: "[o]ur current prosperity and quality of life stand on the shoulders of past investments and past visionaries" (Recycling Ontario's Assets, 2014).[2]

In recent years, in the aftermath of the Global Financial Crisis, the conditions for infrastructure investment, particularly sustainable infrastructure investments, have become particularly favorable. Investors are becoming increasingly interested in sustainable infrastructure projects which promote positive social and environmental impact and 'Corporate Social Responsibility'.[3] However, investors lack: a) an understanding of the risk involved; b) a common set of metrics to measure social and environmental impact; c) concrete examples and financial alternatives; and d) a forum though which to come together with project sponsors to find investment opportunities with embedded ESG characteristics.

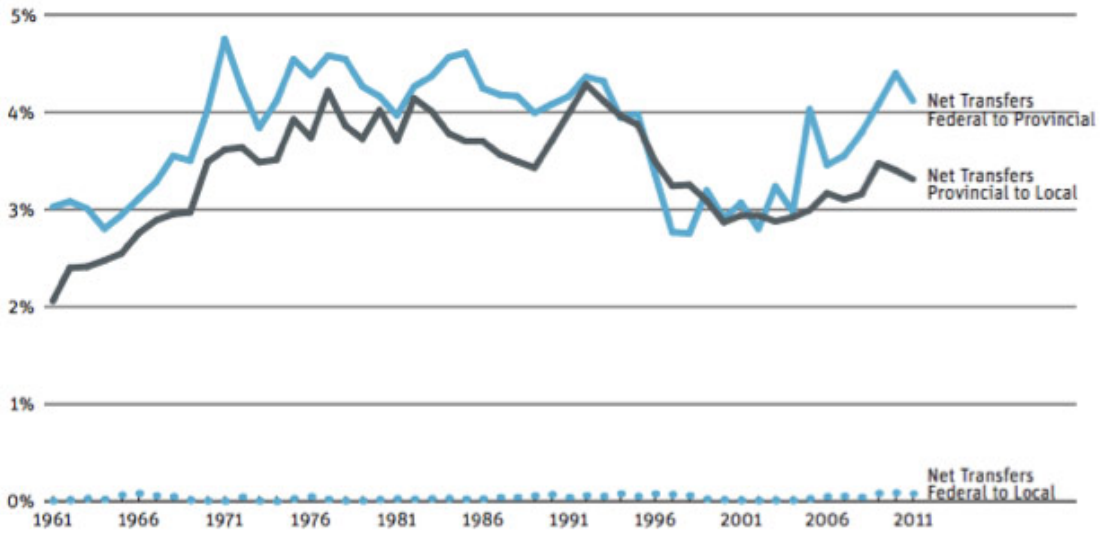
Infrastructure Needs in Canada

Over the past 50 years, there has been a general decline in Canadian federal government ownership of public infrastructure, as well as a transfer of ownership and funding responsibility between the various levels of government (federal, provincial and municipal). In 1955, the federal government owned 44 percent of public infrastructure, the provinces owned 34 percent and municipalities 22 percent.[4] Today, provincial, territorial and municipal governments own and maintain approximately 95 percent of Canada's infrastructure.[5] The federal government provides infrastructure development funding to provincial/territorial governments and municipalities across Canada through federal departments such as Infrastructure Canada.

In a study on the roles and responsibilities of the three levels of government for Infrastructure in Canada, Mackenzie wrote "when it comes to Canada's physical infrastructure, the federal government has the money; the provincial governments have the constitutional authority; and local governments (municipalities) have the responsibility for making the actual investments."[6]

Exhibit 1 illustrates the net transfers of funding between the three levels of government.

Exhibit 1: Intergovernmental Transfer Payments, Percentage of GDP, 1961- 2011



Source: Centre for Policy Alternatives, 2013[7]

Municipalities in Canada are responsible for over 60 percent of the country's infrastructure but collect just eight cents of every tax dollar paid in Canada, with the other 92 cents going to federal and provincial/territorial governments.[8] Today, municipalities are faced with a problem of aging infrastructure and declining investments in infrastructure. Simply put, Canadian municipalities lack the means to sustain their current infrastructure.

There is an ever increasing infrastructure "gap" or deficit, totaling $123 billion. This infrastructure deficit is growing at a rate of $2 billion a year. This is not the only infrastructure funding challenge facing Canada, it is also estimated that an additional $110 billion is needed for new infrastructure.

Exhibit 2: Municipal Infrastructure Deficit in Canada[9]

Source: Crisis and Opportunity: Time for a National Infrastructure Plan for Canada, Canada 2020

It is worth noting that almost all current infrastructure funding is restricted to road improvements, public transit, water and waste-water projects. There is chronic underfunding for all other infrastructure needs. Exhibit 2 provides a breakdown of the magnitude of municipal infrastructure deficit in Canada.

Provincial and territorial governments are responsible for approximately 35 percent of Canada's infrastructure (schools, hospitals, roads). They also provide assistance and financial support to municipalities.

In the past 20 years, both federal and provincial governments have handed over infrastructure responsibilities to municipal governments without a matching increase in funding. This has resulted in an ever increasing infrastructure 'gap' (or deficit) of $123 billion which is growing at a rate of $2 billion every year.[10] A study by the Canada West Foundation estimated that while the accumulated infrastructure deficit stands at $123 billion for existing infrastructure, an additional $110 billion is needed for new infrastructure.[11] The primary source of revenue for municipalities is property tax collection. Municipalities also receive tax transfers from other levels of governments, and collect taxes on the sale of goods and services. The Gas Tax and Municipal GST rebate provide funds to municipalities by the Federal

Government targeted to infrastructure investment.

Through organizations such as Infrastructure Ontario, the provinces oversee the infrastructure needs in each province. They also provide project management and funding support to municipalities through initiatives such as Ontario's Municipality Infrastructure Investment Initiative. Exhibit 3 is a list of estimates derived from findings recorded in different infrastructure studies on the cost to maintain, repair or build infrastructure in Canada.

Exhibit 3: Estimated Cost for Infrastructure Repair, Maintenance and Upgrades

Study	Estimated Infrastructure Funding Needs
McKinsey Global Institute[12]	$66 billion to maintain and repair urban roads and bridges between 2013 and 2023
Mirza (2007)[13]	$22.8 billion to repair and maintain existing transit infrastructure and approximately $7.7 billion for new transit infrastructure.
Canadian Chamber of Commerce[14]	Congestion is costing Canada, $15 billion per year, which is equivalent to almost one percent of Canada's GDP
Canadian Chamber of Commerce[15]	$293.8 billion to upgrade Canada's electricity infrastructure between 2010 and 2030

Source: McKinsey Global Institute, Mirza, and Canadian Chamber of Commerce.

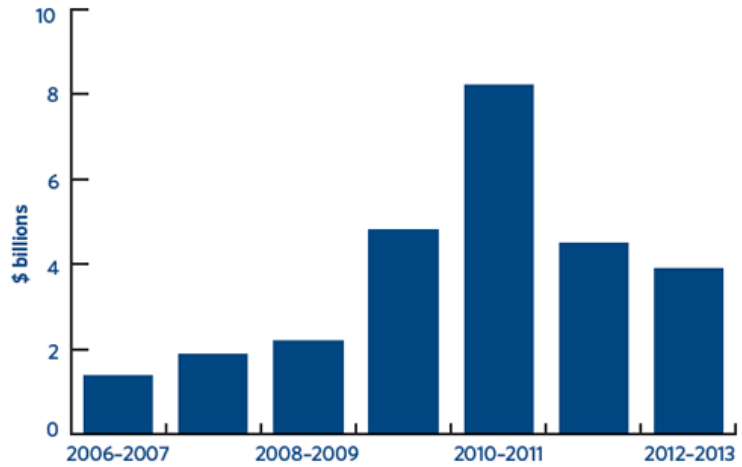
Over the past decade, the Federal Government of Canada introduced infrastructure stimulus programs such as *The New Building Canada Plan* providing $53 billion for provincial, territorial and municipal infrastructure. A component of the *The New Building Canada Plan* includes the Gas Tax Fund which provides funding to municipalities to support infrastructure programs. During the 2007-2014 periods, the federal government committed nearly $40 billion to *The* New *Building Canada Plan* and the *Economic Action Plan* to support improvements to Canada's public infrastructure (see Exhibit 4). However, in spite of nearly two decades of federal infrastructure investment, [16] the infrastructure deficit continues to grow.

Competing priorities such as health care and education have resulted in underinvestment in infrastructure, by all levels of government, for many years. The problem is further compounded by the increasing cost of raw materials needed for infrastructure projects, thus resulting in increased project costs. It should be noted that the federal infrastructure funding is not expected to increase[17] in the near future. Moving forward, it will be difficult for all levels of government to address the

Over the past decade, the Federal Government of Canada introduced infrastructure stimulus programs such as *The New Building Canada Plan.*

infrastructure gap as they wrestle with budget deficits and competing priorities.

Exhibit 4: Annual Federal Infrastructure Spending



Source: Library of Parliament using data from *Public Accounts of Canada* and Canada's Economic Action Plan

A 2013 study by the Canadian Chamber of Commerce[18] estimated that the magnitude of investment needed to address Canada's infrastructure deficit could be as high as $570 billion. This is in addition to a report by the Association of Consulting Engineers of Canada which estimated that 50 percent of public infrastructure in Canada will reach the end of its utility by 2027.[19] Regardless of the actual magnitude of the investment needed in infrastructure, it is evident that increased levels of private investments are needed.

Sustainable/Impact Infrastructure

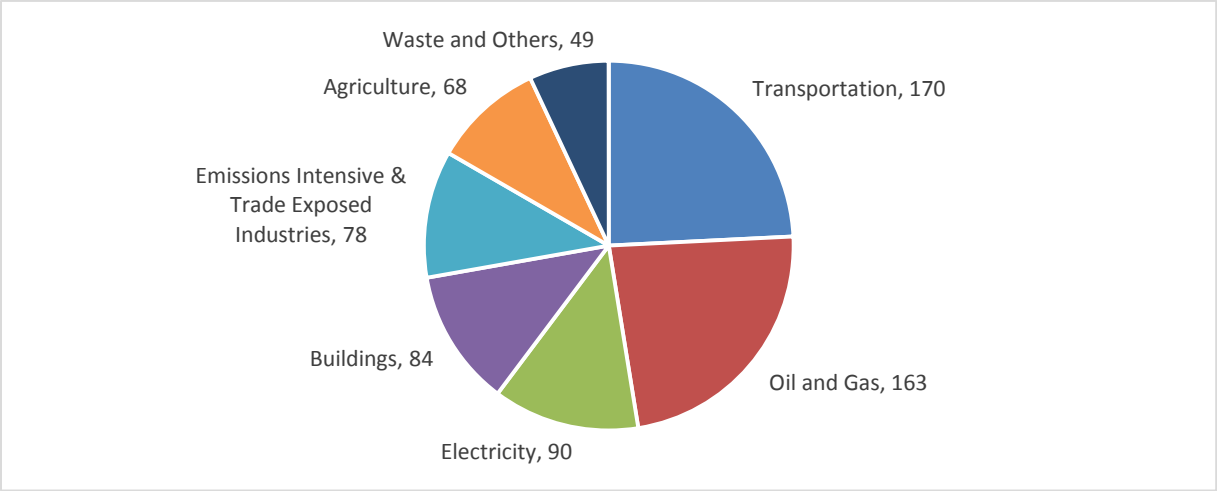
Sustainability means the 'ability to endure.' Sustainable infrastructure projects consider environmental, economic and social impacts in the design, building and operating of infrastructure. Sustainable or impact infrastructure projects strive to improve social, environmental and governance (ESG) performance of a project while also accounting for economic benefits and long term value for the community.[20] Some examples of impact infrastructure considerations are: accounting for climate change, optimizing energy savings, reducing natural resource depletion, and utilizing renewable energy. Since impact infrastructure takes ESG concerns into account, it reduces the risk of future litigation and non-compliance with laws and regulations.

Canada originally made a commitment under the Kyoto Protocol to reduce greenhouse gas emissions by 17% from its 2005 levels by the year 2020. However, Canada's emissions rate is actually expected to go up due to an increase in oil extraction activity in the oil sands. International pressure is mounting for Canada to reduce

greenhouse gas emissions and the country must find new ways to reduce its global footprint. Impact infrastructure is a key consideration to help to reduce Canada's global carbon footprint.

Although Canada makes up less than one half of one percent of the world's population, it is the world's eighth largest producer of greenhouse gases (702 million metric tonnes in 2011).[21] The transportation and oil/gas sectors (the two largest emitters of greenhouse gases) account for 24 percent and 23 percent of the greenhouse gas emissions in Canada respectively.[22] It is in the transportation sector where impact infrastructure can help reduce greenhouse gas emissions by promoting the use of solar and wind energy, hybrid and electric cars and greener buildings. Exhibit 5 is a breakdown of greenhouse gas emissions in Canada by sector.

Exhibit 5: Canada's Greenhouse Gas Emissions by Sector 2011 (Mt CO2 eq.)



Source: Environment Canada [23]

Canada has seen an increase in natural disasters in recent years. The International Panel on Climate Change noted that extreme weather is likely to become more common in the next 50 years. It is therefore necessary to factor in new environmental considerations when making decisions on infrastructure to ensure that future infrastructure is sustainable and capable of adapting to the needs of the environment and community.

The need for sustainable infrastructure continues to be highlighted by the numerous and serious environmental problems facing Canada, as well as continued social problems around the world. One of the best ways Canada can meet its international greenhouse gas and environmental obligations is through sustainable and innovative infrastructure.

In the 2008 budget, the Government of Canada announced a public-private partnership program, providing a $1.25 billion fund and creating PPP Canada, a Crown Corporation to support the partnerships. [24] Australia has adopted a novel approach to effectively leverage the domestic investment community and pension fund industry.

In 2011 the Financial Services Council of Australia undertook a review of Australia's pension industry's appetite for investment in public infrastructure. The review suggested that the Australian government should adopt a formal policy of "recycling" infrastructure assets. Under this policy the federal government would review operating assets held by the government, identify those that could be sold or recycled and use the proceeds to build and finance infrastructure. The approach includes attracting pension funds to invest in core infrastructure projects, in particular brownfield projects with a strong operating history. [25] In July 2014, the Australian government created the Asset Recycle Fund to fund infrastructure projects.[26]

The United Kingdom introduced a National Infrastructure Plan in 2010. This plan sets out a broad vision for the UK's infrastructure needs. Under this plan, the government specifies the country's infrastructure needs, provides a comprehensive framework for evaluating and prioritizing infrastructure investments across the country, identifies barriers to investment and mobilizes both public and private resources.[27]

Noted expert Dr Ann Dale's study [28] on sustainable infrastructure in Canada noted that certain considerations should be taken into account when planning sustainable infrastructure projects. These areas include: a) consideration of innovative infrastructure options, e.g., retrofitting existing infrastructure to improve energy conservation and improve the quality of life for inhabitants and b) environmental and climate change impact mitigation. Dale also believes that there must be improvements to long term planning for infrastructure, as well as to infrastructure governance.

Governments globally are taking decisive steps to attract private investments into infrastructure projects.

New Approaches by Responsible Investors in Infrastructure Investment

Pension funds managers are increasingly finding that investment in infrastructure projects meet their investment criteria and asset characteristics and are excellent assets for inclusion in their portfolios. In most cases these assets are held for the long term, particularly as these infrastructure investment opportunities are increasingly structured as design/ build/ finance/ operate (DBFO) projects.

Sustainable infrastructure has increasingly emerged as an excellent investment opportunity. With a strong reward to risk ratio, low volatility, and excellent durability, sustainable infrastructure is the smart choice for many private investors.

Pension funds and other institutional investors are increasingly aware that as long-term investors they need to take environmental, social and governance (ESG) factors into consideration in their investment decision-making. The United Nations-backed Principles for Responsible Investing (PRI) currently has 1,300 signatories who manage assets over $45 trillion. The PRI comprises 6 Principles that encourage ESG integration by institutional investors. Eight out of the ten[29] of Canada's largest pension funds are signatories to the PRI or have a responsible investment policy. While initially focused on their public equity portfolios, ESG considerations are now being taken into account in fixed income and alternative assets such as private equity, real estate and infrastructure. Sustainable infrastructure projects can open doors to increased capital from responsible investors with an interest in integrating environmental, social and governance issues into all aspects of their investment portfolios.

Canada's trusteed pension funds currently hold assets in excess of $1.2 trillion.[30] The ten largest pension funds by the end of 2011, collectively managed approximately $714 billion.[31] In recent years, Canadian pension funds have invested in some of the largest infrastructure deals in the world such as: the operator of seven UK airports including Heathrow, one of the largest electricity transmission and distribution companies in the U.S., and three Chilean water utilities.[32] In 2011, a Canadian pension fund, OPSEU Pension Trust, invested $969 million in infrastructure (7.1 percent of the total fund value) and received a 29.6 percent return on investment.[33]

Sustainable infrastructure provides a good investment opportunity (see appendix A for list of international pension funds that invest in infrastructure). In addition to integrating ESG in this asset class there are three other characteristics associated with sustainable infrastructure which makes it appealing to prospective investors. These are: a) the strong reward-to-risk ratio,[34] b) low volatility (cash flow) and c) duration.

Infrastructure is a good asset class for liability matching.

Since pension funds tend to have long term and relatively stable excepted payments to their beneficiaries, infrastructure investments can match inflation-linked stable returns with the liabilities they face in the future. Also, infrastructure has low correlation to other markets and therefore adds diversification thereby reducing a portfolio's total risk. The expected return on investment for infrastructure investments, as with any investment, is directly correlated to the risk of the project. A recent study conducted by the Institute for Research on Public Policy found that the return on investment for infrastructure investments can be anywhere between 17-25 percent.[35] Given the infrastructure gap in Canada (estimated at over $100 billion in Ontario alone) [36] there are ample opportunities for infrastructure investments. Ontario is also home to three large pension funds that already actively invest in infrastructure projects. Exhibit 6 lists some of their investments in infrastructure projects.

Pension funds invest billions of dollars in infrastructure assets but almost none of these investments are made in Canada.[37] The absence of a public policy framework that clearly outlines the challenges and defines the opportunities appears to be a major reason why large institutional investors, such as pension funds have been reluctant to invest in Canada. Given a policy framework and the right opportunity [38] Canadian and international pension funds, both those who are PRI signatories and those that are not, would find investing in Canadian infrastructure that embeds ESG considerations more appealing.

CIIX a Platform to Deliver Positive Impacts

The CIIX is designed to help stimulate investment in impact infrastructure projects in order to overcome the current infrastructure deficit. There is no doubt that private investment is needed in infrastructure projects. However, to date local, provincial and territorial governments have not been able to measure the environmental and social impact of infrastructure projects using reliable, quantifiable and comparable metrics. CIIX can help by introducing robust metrics to measure ESG indicators and by linking impact infrastructure investment opportunities to potential investors.

The CIIX supports private-public investment partnerships that provide positive economic, social and environmental impact, in addition to job

The Canadian Impact Infrastructure Exchange (CIIX) will provide an investment platform that connects investors (including Canada's largest pension plans) to impact infrastructure investment opportunities. It will also provide investors with high quality, consistent and comprehensive data that measure both the financial and extra-financial returns[i] of impact infrastructure investment opportunities.

creation, community resiliency and financial return. It will also help to improve transparency of infrastructure requirements by including an analysis of the environmental, social and governance (ESG) aspects of investment opportunities. Increased transparency raises investor confidence and the likelihood that they will invest in infrastructure assets. In addition transparency lowers the transactional risk associated with these projects by reducing their required returns, thus making it less costly for the municipalities when utilizing such private funding.

The CIIX will review infrastructure assets in the various categories such as water management, telecommunications, waste management, energy transmission and distribution (e.g., wind, nuclear, solar), transportation (e.g., roads, airports), public transit, health care, and other social and civil infrastructure. Due diligence will be observed when assessing the total cost and benefit of different impact infrastructure projects. Externalities (such as the valuation of risks, social impact, employment impact, and environmental impact) will be included in the assessment of various infrastructure investment options and investors will have the opportunity to select optimal investments opportunities using information provided by CIIX.

When evaluating the environmental results of infrastructure projects, Impact Infrastructure LLC assigns a dollar value to various economic factors such as the environmental costs, benefits, and risks of infrastructure projects. In particular, carbon benefits of projects are quantified using a range of values for CO_2. These values can be over-ridden with known values for carbon credits or ranges for expected prices from carbon finance schemes. In addition to these economic factors, other possible benefits such as the societal, business, low income, health, recreational or flooding risk benefits of infrastructure will be considered. By taking into consideration all of the aforementioned factors, Impact Infrastructure LLC is able to compare designs within projects and between different projects (allowing for prioritization). When assessing projects, geographically specific variables are taken into consideration in order to provide more relevant and accurate values. Such comparable metrics that include ESG considerations are vital in infrastructure investment.

Another important area where CIIX can be useful is in attracting large institutional

investors to smaller infrastructure deals, by bundling smaller investment opportunities together to make them more attractive to large institutional investors. This is important for areas where community-based projects are small and require less investment, e.g. social enterprise, community economic development, and small scale renewable energy projects (as seen in many northern and aboriginal communities in Canada). These small scale investments on their own lack the scale necessary to interest large institutional investors.

The CIIX draws on the US model, the West Coast Infrastructure Exchange (WCX)[39] as an example. Launched in November 2012, the WCX connects West Coast Infrastructure needs within an ESG framework. See Carleton Centre for Community Innovation's detailed case study of the WCX to explore lessons learned and best practices in ESG infrastructure exchanges. It is hoped that a similar platform could be developed in Canada to meet our ESG infrastructure investment needs.

CIIX Partners

The Carleton Centre for Community Innovation (3ci) provides the program management and home base for the CIIX. It is deeply committed to extending impact investing to large institutional investors in Canada, particularly those declared as responsible investors who integrate social, environmental and governance factors into their investment decision-making. 3ci will act as a convener of the key players required to establish the CIIX in Canada and drive this process forward. 3ci has a strong expertise in responsible investing and impact investing.

Impact Infrastructure LLC brings its expertise in the development of impact infrastructure exchanges that integrate ESG in infrastructure deals. Impact Infrastructure LLC is the driving force behind the Business Case Evaluator, a tool designed to "assess risk; value social, environmental and economic costs and benefits; and balance risk/reward returns from structured deals (Impact Infrastructure LLC, 2012) " The Business Case Evaluator (TM) will be fully integrated into the CIIX and will ensure that such an exchange delivers real, tangible and measurable results for investors, government and communities. Impact Infrastructure LLC has a deep understanding of sustainable infrastructure and ESG integration through the infrastructure investment life cycle.

Often overlooked in the development of public infrastructures are challenges related to public procurement and deal structuring. These a crucial points in the infrastructure development cycle. If public entities are not demanding sustainable assets and are not structuring them in a manner that achieves an optimal allocation of risks, value-for-money for the public purse across the asset life cycle, cannot be achieved.

CIIX partner, the **International Institute for Sustainable Development (IISD,)** will assist in designing tender specifications, award criteria and contract conditions that embed sustainable performance. As public

private partnerships are now becoming the default manner in which governments procure infrastructure, IISD will also bring to CIIX expertise on project finance and deal structure. These aspects are particularly challenging in the case of sustainable infrastructure as they are usually, more expensive to build and encompass new technologies that have limited market penetration and track records.

Capital markets, hence, have insufficient information to price these assets and moreover, insufficient incentives to prioritise them. To address this issue, IISD will also work through CIIX to explore innovative financing solutions to reduce the cost of capital for sustainable infrastructure. These include 'green' guarantees, 'green' project bonds, 'green' credit enhancement and green securitization.

Additionally we will explore CIIX's ability to act as a platform to aggregate smaller impactful infrastructure deals. **Purpose Capital** brings a wealth of expertise on impact investing from across Canada and internationally. As a national advisory and intermediary firm, Purpose Capital brings its expertise in community-level deal flow and aggregation of smaller impact investing deals to CIIX. There is a significant variability around investor preferences and risk, return and impact/ESG considerations, as well as investment opportunities across different infrastructure-focused sectors across various provinces. Additionally, the search, transaction and monitoring costs of individual transactions are relatively high. Purpose Capital will share perspectives from how these challenges could be addressed via the CIIX, drawing on its experience and research from impact investing and responsible investing.

Appendix A: International Pension Funds that Invest in Infrastructure

Fund	Infrastructure Investment (CAD)	% of Total Portfolio
Australian Future Fund	$5.01 Billion	6.4
BT Pension Scheme	$610.9 Million	1
Folksam	$157.1 Million	0.33
Pensioensfonds Zorg en Welzijn	$24.36 Billion	14.5
Construction & Building Unions Superannuation	$744 Million	4
National Pensions Reserve Fund	$461.33 Million	2.25
New Zealand Superannuation Fund	$1.58 Billion	9
VicSuper	$225 Million	2.5

Source: Author, Carleton Centre for Community Innovation, 2013.

End Notes

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[15] ibid

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[18] Friendship Bay Consulting. 2013. The Foundations of a Competitive Canada, the Need for Strategic Infrastructure Investment, The Canadian Chamber of Commerce (p.1). http://www.chamber.ca/media/blog/131218-The-Foundations-of-a-Competitive-Canada/131218_The_Foundations_of_a_Competitive_Canada.pdf (accessed October 21, 2014)

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[24] P3s engages the private sector for the life of the infrastructure asset through the use of a bundled contract. It also transfer a major share of the risk associated with infrastructure development to the private sector.
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[31] Boston Consulting Group, The Top 10, Investing for Canada on the World Stage, Canada's Top Ten Pension Funds: Helping Drive National Prosperity. https://hoopp.com/uploadedFiles/Content/Newsroom/newsdocs/Top_10_Funds_Investing_for_Canada.pdf (accessed October 20, 2014)

[32] ibid

[33] OPSEU Pension Trust. 2012. Delivering Sustainability: Annual Report 2011. http://www.optrust.com/AnnualReports/AR2011/OPTrust_AR_2011.pdf. (Pg 12)

[34] The risk of impact infrastructure is divided according to the types of investments. For example, Greenfield infrastructure investments are considered riskier than say Brownfield investments which are considered the least risky. Mangraviti, N. 2010. Benefits Canada, Infrastructure: Fields of Dreams. http://www.benefitscanada.com/investments/alternatives/infrastructure-fields-of-dreams-330 Accessed November 12 2014.

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[36] Borque, J.C. 2013. Ontario Needs to Think about Investing in Infrastructure, The Globe and Mail. http://www.theglobeandmail.com/news/politics/ontario-needs-to-think-about-investing-in-infrastructure/article11675582/ (accessed October 20, 2014)

[37] ibid

[38] International pension funds such as New Zealand Superannuation Fund and BT Pension Fund invest anything between 0.33 per cent to 14.5 per cent of their total portfolio value on infrastructure investments.

[39] The West Coast Infrastructure Exchange. http://westcoastx.com/