

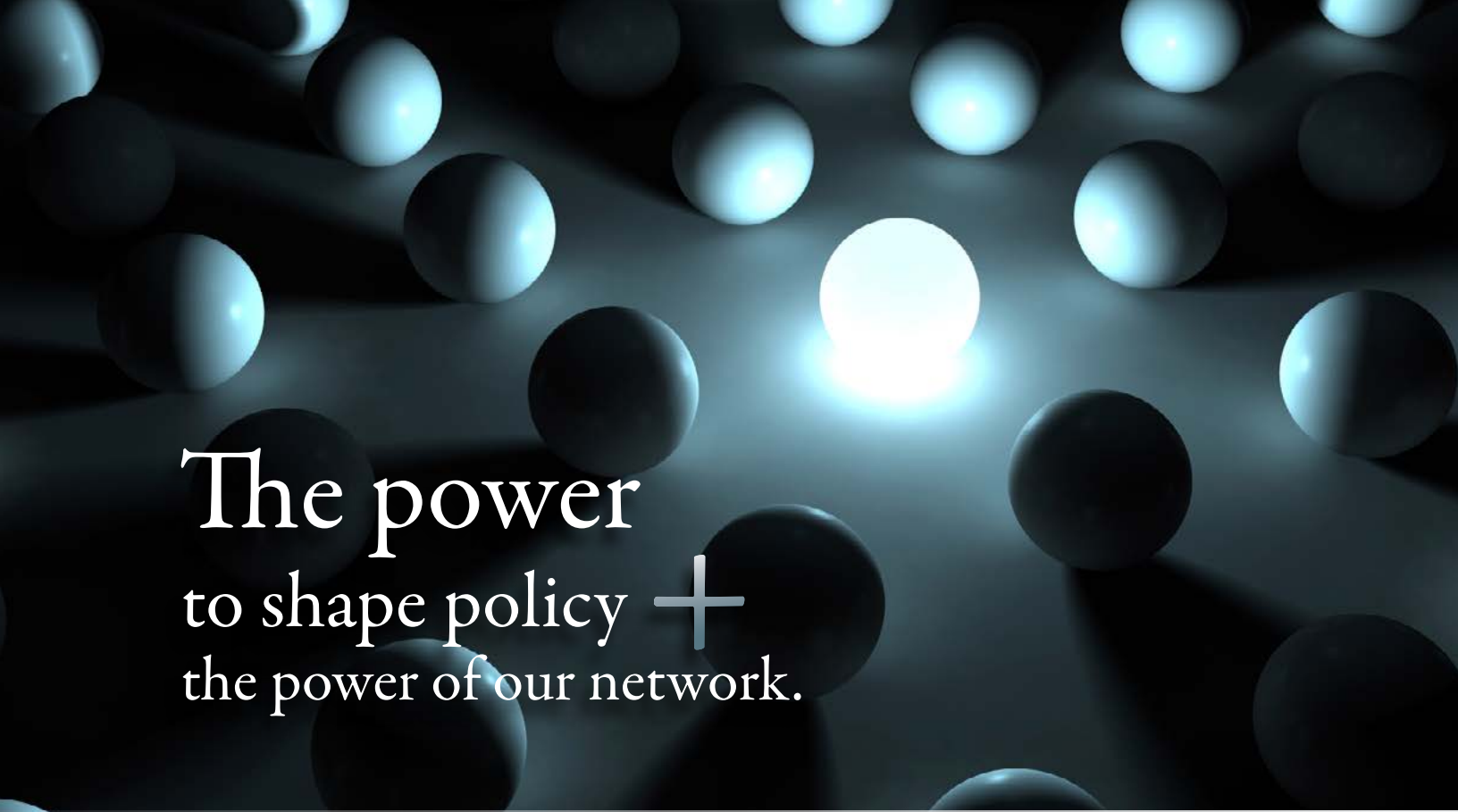


# THE FOUNDATIONS OF A COMPETITIVE CANADA:

## THE NEED FOR STRATEGIC INFRASTRUCTURE INVESTMENT

December 2013





The power  
to shape policy +  
the power of our network.

Get plugged in.

As Canada's largest and most influential business association, the Canadian Chamber of Commerce is the primary and vital connection between business and the federal government. It continually demonstrates impact on public policy and decision-making to the benefit of businesses, communities and families across Canada.

Experience the power of a network of over 450 chambers of commerce and boards of trade, representing 200,000 businesses of all sizes in all sectors of the economy and in all regions.

Be heard.

Research conducted by Friendship Bay Consulting.

# TABLE OF CONTENTS

<b>Executive Summary</b> .....	1
The Importance of Public Infrastructure Investment .....	1
<b>I. Infrastructure Investment and Economic Performance</b> .....	2
The Link Between Investment and Growth.....	2
<b>II. Infrastructure Investment in Canada</b> .....	5
Where Are We Now?.....	5
Recent Signs of Progress .....	13
<b>III. Taking Action to Improve Investment Levels</b> .....	15
Requirements for Enhanced Investment .....	15
Private Investment in Public Infrastructure: The Case for P3s .....	18
The Benefits of P3s .....	20
<b>IV. Making Investments More Effective</b> .....	24
Concrete Steps to More Effective Investment.....	24
<b>V. Conclusions and Recommendations</b> .....	26
Conclusions.....	26
Summary of Recommendations.....	27
<b>Bibliography</b> .....	28
<b>Appendix - List of Interviews</b> .....	29



# EXECUTIVE SUMMARY

## The Importance of Public Infrastructure Investment

Modern and efficient infrastructure is a core component of a competitive economy. Public infrastructure such as roads, bridges, highways, water systems and the electrical grid provide services critical to economic competitiveness, sustainability and quality of life. Without sufficient investment and upkeep of public infrastructure stock, countries rapidly fall behind.

The link between investment in core public infrastructure and productivity performance is clear. Equally clear are the consequences of underinvestment. From the mid-1990s until 2006, infrastructure investment in Canada declined while investment in infrastructure in the United States (U.S.) increased by 24 per cent. Over the same period, Canada went from near parity with U.S. productivity to 20 per cent lower.

Canadian public investment in infrastructure has not kept up with our economic needs. For example, the transportation infrastructure in our major cities can no longer keep up with demand. Congestion costs for the country as a whole approach \$15 billion per year. This is almost one per cent of our GDP.

The service life of public infrastructure extends only four or five decades. This poses a particular challenge for Canada where much of the existing public infrastructure was constructed during the middle of the last century. A large percentage of Canadian publically owned infrastructure needs to be refurbished or completely retired. While increasing usage, growing demand and environmental stressors have all contributed to this decay, much of the decline can be attributed to decades of underinvestment and poor maintenance. To make matters worse, thanks to the prolonged period of underinvestment, the costs of updating and maintaining existing infrastructure are increasing.

For years, Canada has failed to keep pace with its public infrastructure investment needs. Evidence of this failure is everywhere. According to the Federation of Canadian Municipalities (FCM), 30 per cent of our municipal infrastructure is at risk. Similarly, the Conference Board of Canada has recently stated that Canada needs to invest \$293.8 billion in electricity infrastructure between 2010 and 2030.

Fortunately, we are starting to see renewed attention to the vital importance of our core public infrastructure. In recent years, there have been significant increases in both attention to and funding for core public infrastructure. The challenge the nation faces now is to ensure current infrastructure investment levels are not viewed as a one-off contribution to recession fighting but rather as the start of a new sustained level of investment.

Unfortunately, our investment needs far outstrip the availability of public funds. To succeed, we not only need to attract new levels of private investment, but we must also ensure our investments are made strategically, effectively and efficiently.

Bringing infrastructure in Canada back to the level needed to support prosperity will not be easy. It will require an ongoing commitment by all levels of government and active engagement with private sector stakeholders. We have to change the dialogue from “catch-up” investments or “economic recovery” to investing in our competitiveness as a country.

For the past two years, the Canadian Chamber of Commerce has listed inadequate investment in our public infrastructure as one of the [top 10 barriers to Canadian competitiveness](#). In order to gain a better understanding of the current state of play in Canada, the Canadian Chamber of Commerce enlisted the aid of Friendship Bay Consulting. This report summarizes some of their key findings.

# I. INFRASTRUCTURE INVESTMENT AND ECONOMIC PERFORMANCE

## The Link Between Investment and Growth

*“Investments in infrastructure are expensive but they are among the best investments government can make. Our infrastructure shapes the long-run prosperity of our economy, society and communities. Economic development turns on more intensive and productive use of space and also on increasing the velocity of moving people, goods and ideas. The infrastructure we build now can help stimulate demand and provide good jobs for people who need them and plays an important role preparing our economy for the future.”*

*Richard Florida, Director of the [Martin Prosperity Institute](#) at the University of Toronto’s Rotman School of Management.*

Public infrastructure is the foundation of a healthy economy. It can include everything from transportation infrastructure, such as roads, highways and bridges, to support systems, such as water and wastewater management and electrical systems, to social infrastructure, such as parks, hospitals, libraries and community centers. Many of these facilities are characterized by a relatively long design life as well as a need for ongoing investments in rehabilitation and replacement.

This is a significant challenge for Canada where much of the existing public infrastructure was built over 50 years ago. Today, a large percentage of Canadian publically owned infrastructure desperately needs maintenance or even complete replacement. While increasing usage due to population growth and environmental stressors have contributed to

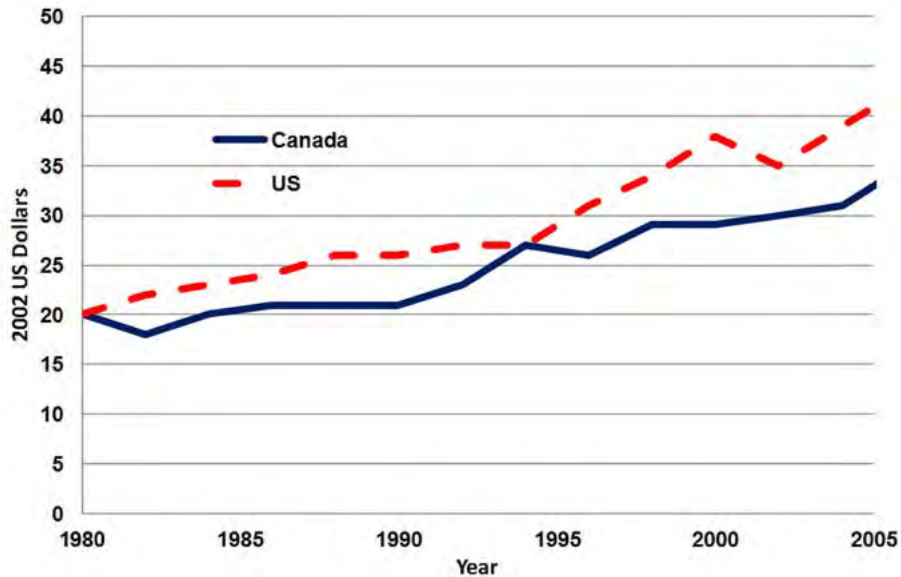


this decay, much of the decline can be attributed to decades of underinvestment and poor maintenance. To make matters worse, thanks to the prolonged period of underinvestment, the costs of updating and maintaining existing infrastructure are increasing.

Unfortunately, the years of underinvestment have not been without cost. The decline of Canada’s investment in public infrastructure coincided with a decreased productivity growth in the manufacturing sector. Manufacturing productivity levels were almost identical in Canada and the United States in the mid-1990s, but by 2006 the U.S. level was over 20 per cent higher (Graph 1). Over the same period, infrastructure investment in Canada declined by 3.5 per cent, compared with a 24 per cent increase in the U.S.

Graph 1

MANUFACTURING OUTPUT PER HOUR WORKED IN CANADA & USA 1980-2006<sup>3</sup>



Strategic investment in trade enabling and supporting infrastructure is vital if Canada wants to remain competitive. Canada needs a long-term and predictable infrastructure strategy. This strategy has to be flexible enough to adapt to evolving needs and must include targeted investments in Canada's major economic hubs, gateways and public transit systems.

### Recommendation

Canada needs a long-term, predictable, flexible and strategic investment strategy. This strategy must include targeted investments in Canada's major economic hubs, gateways and public transit systems.

Over the past several years, there have been numerous studies that examine the linkage between infrastructure investment and productivity. The Institute for Research on Public Policy (IRPP), the Conference Board of Canada, the Canada West Foundation and Statistics Canada have all come to similar conclusions. Statistics Canada's studies indicate that public infrastructure investment makes an important contribution to productivity growth. According to its research, investment in public infrastructure contributed to a nine per cent growth in labour productivity from 1962 to 2006.<sup>40</sup> Furthermore, the largest contribution to productivity growth occurs when public infrastructure investment is highest. Unsurprisingly, the effects of infrastructure investment vary widely across industries with the largest effects occurring for construction, transportation and the wholesale/retail sectors.

Similarly, the IRPP found that a sustained 10 per cent annual increase in infrastructure investment could reduce manufacturing unit production costs by nearly five per cent per year – equivalent to a five per cent increase in productivity.<sup>3</sup> This same study indicated that returns on investment in public infrastructure may be as high as 17 per cent to 25 per cent.

Research undertaken by the Conference Board of Canada found, that from 2000 to 2008, capital investment contributed to 25 per cent of overall labour productivity growth.<sup>12</sup> The impact of public infrastructure investment in Ontario from 2006 to 2014 is forecast to contribute to an increase in average Ontario income of \$1,044 in 2012 dollars.

The Canada West Foundation draws on earlier studies but makes two additional important points. First, there is virtually unanimity among academics that investments in public infrastructure enhance productivity and growth.<sup>5</sup> Second, public infrastructure investment must be strategic. It is not more infrastructure that contributes to growth and productivity but the right infrastructure in the right places.

For example, Canada's transportation infrastructure is in dire need of investment. Major roads and highways are crumbling and our ports of entry need continued investment to remain competitive and to sustain Canada's import and export base. Canada's multimodal transportation sector is also responsible for the movement of people. Without an efficient transportation network, not only do our businesses suffer, but our quality of life diminishes. Given the complicated nature of North American supply chains, it is not surprising to see a close linkage between manufacturing productivity and infrastructure investment.

The consequences of under-investment are real. The majority of municipal roads require immediate repair. One out of every four wastewater treatment plants needs to be upgraded, and congestion has become a crippling problem. The TD Bank Financial Group has estimated that the loss from congestion and shipment delays in the Greater Toronto Area was \$2 billion annually in 2004 while a 2008 study for Metrolinx put this congestion cost at \$6 billion annually when indirect costs were included. Congestion costs for the country as a whole approach \$15 billion per year.

## II. INFRASTRUCTURE INVESTMENT IN CANADA

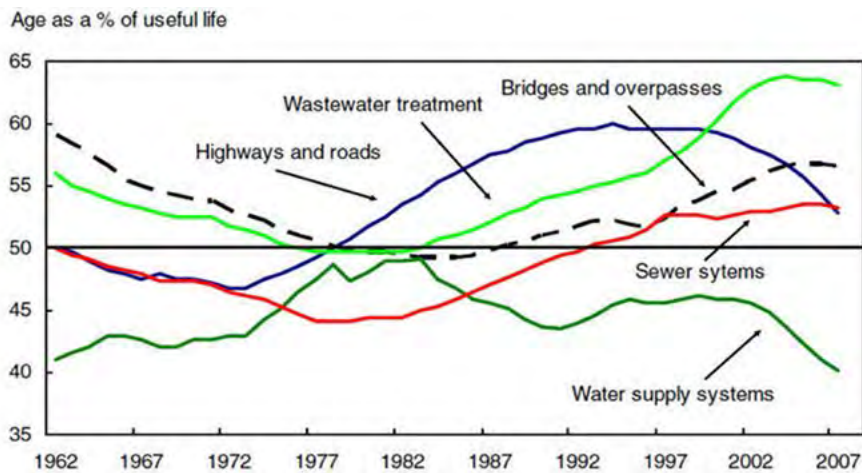
### Where Are We Now?

Following the end of World War II, Canada invested heavily in its public infrastructure stock. The high growth in the 1950s and 1960s coincided with a period of unprecedented infrastructure investment. As a consequence, a significant portion of our existing infrastructure stock was built during this period. Unfortunately, over the past 60 years, these levels have not been sustained. These failures to keep up with investment on upkeep and rehabilitation mean that a preponderance of Canada's public infrastructure is well along in its usage life.

A 2008 Statistics Canada study presents a useful summation of the state of public infrastructure over the course of several decades.<sup>39</sup> Graph 2 shows that the average remaining useful life varies significantly from one infrastructure type to another. Water supply systems are in a relatively good state of investment, and wastewater treatment facilities have suffered the most.

Graph 2

REMAINING USEFUL LIFE OF PUBLIC INFRASTRUCTURE 1962-2007<sup>39</sup>



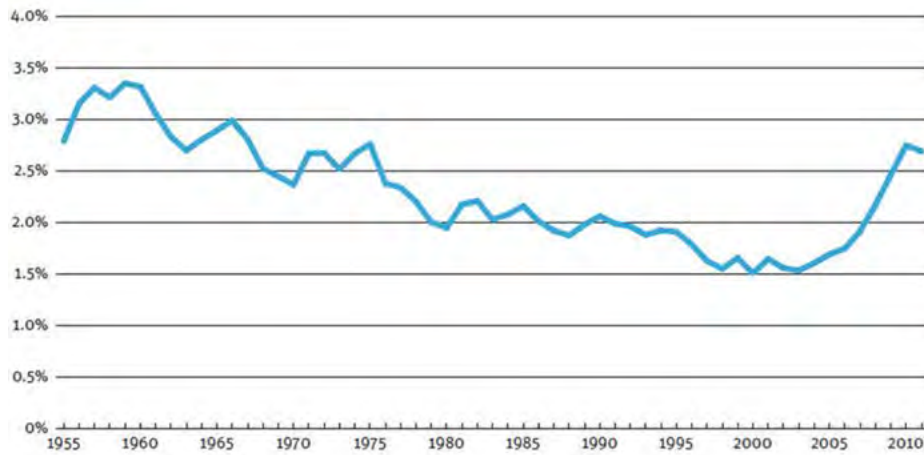
The public infrastructure types shown in Graph 2 account for more than 80 per cent of all public infrastructure owned by all levels of government.

The other issue that Graph 2 highlights is that the nation went through a period in the 1980s and 1990s of very low investment. Investment in public infrastructure terms as a percentage of GDP declined continuously from 1960 to 2004 (Graph 3). Only recently has investment increased, much of which can be attributed to stimulus programs. To put a sense of

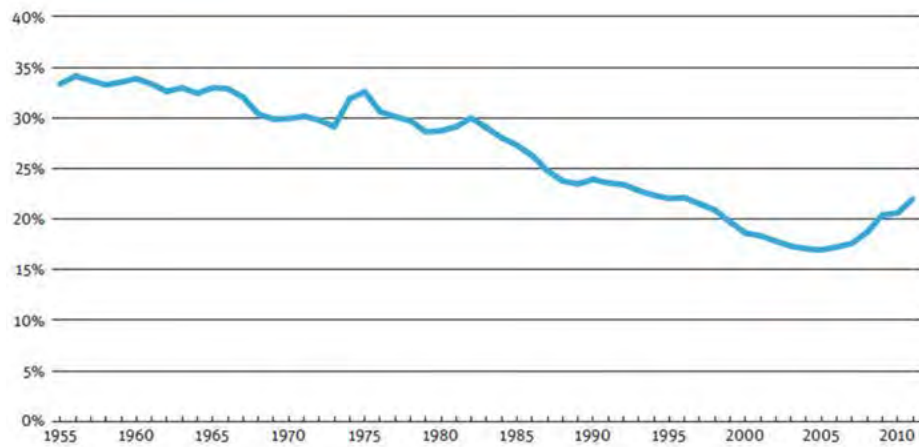
scale on Graph 3, the gap between the average three per cent of GDP in the 1960s and the average of 1.5 per cent in the 1990s represents \$24 billion in annual capital investment that was not made. By way of comparison, the world average long run expenditure on infrastructure is 3.8 per cent of GDP per year.<sup>16</sup>

As a result of these much lower levels of investment, public assets declined as a percentage of GDP from approximately 30 per cent in 1980 to 22 per cent in 2011 as shown in Graph 4.

**Graph 3**  
**INVESTMENT IN PUBLIC INFRASTRUCTURE AS PER CENT OF GDP 1955-2010<sup>6</sup>**



**Graph 4**  
**NET PUBLIC INFRASTRUCTURE ASSETS AS PER CENT OF GDP**  
**(NET OF DEPRECIATION) 1955-2010<sup>6</sup>**



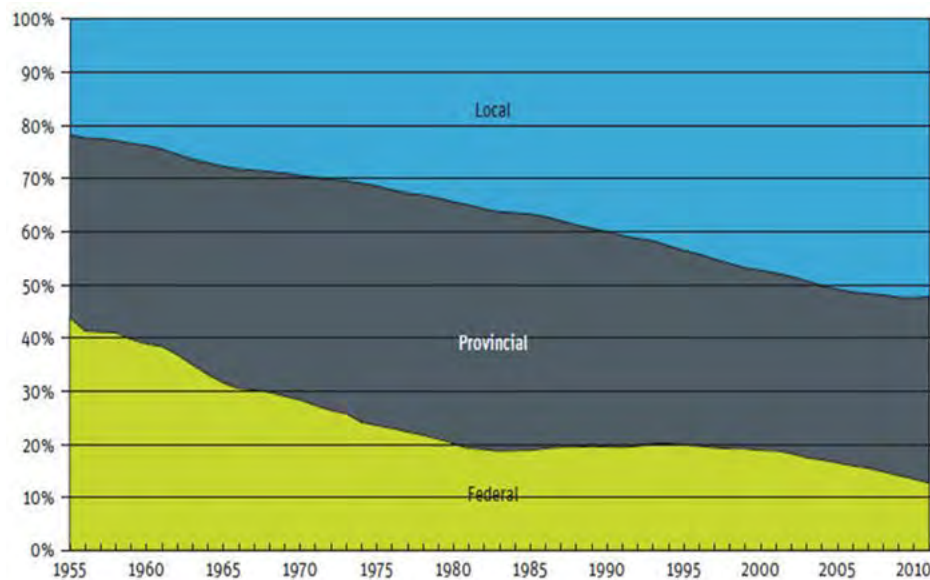
### How Did We Get Here?

Further complicating the problem, during the 1990s, when federal and provincial governments were struggling with deficits, much of the responsibility for infrastructure maintenance and upgrades was downloaded to the municipal level. Canadian municipalities now face the challenge of building and maintaining the majority of Canadian infrastructure.

As Graph 5 shows, municipalities are currently responsible for more than 50 per cent of public assets.



**Graph 5**  
**ASSET SHARES BY LEVEL OF GOVERNMENT 1955-2010<sup>6</sup>**



**A Staggering Conclusion:**

The amount of funding needed to put our country back on track is substantial. Depending on methodology, the infrastructure deficit is defined as being in the range of \$50 billion to \$570 billion. Although the range is large, the message is consistent. Canada needs to significantly increase its investment in public infrastructure or see its infrastructure continue to decay. It is clear that our national infrastructure stock is suffering from years of underinvestment and poor management.

Just to maintain the current infrastructure stock at the 2011 levels as a per cent of GDP would require an ongoing annual investment level of 2.9 per cent of GDP—a higher level than was achieved in the peak year of the recent stimulus program. Obviously, to achieve a higher level of public infrastructure (in terms of both capacity and condition) would require even more investment.

Given the linkage between infrastructure investment and productivity, it is clear that Canada has no choice but to make infrastructure investment one of its highest priorities.

The graph also shows that this increasingly high level of responsibility has only occurred over the past 50 years, as:

- More of the population has migrated to urban areas and the outward growth of these areas consumes more of the services historically provided by this order of government.
- Expectations increase for, and growth of, additional levels of municipal services other than core utilities and transportation.
- The federal government withdrew from asset intensive operations. This includes the privatization of CN, Air Canada and Petro Canada; DND base closures; the transfer of major airports, ports and air traffic control to local non-governmental authorities; and, the increased use of leasing private sector facilities for standard government office space since the mid-1990s.
- Some responsibilities have been downloaded from the federal and provincial governments.

How did Canada arrive at a point where it needs large investments simply to catch up on investments that should have been made in the past? On the surface, it would be easy to deduce that the answer is that municipalities have the bulk of the responsibility for investment in capital infrastructure, but only receive eight per cent of tax revenue.

In reality, the problem at all orders of government and public institutions (e.g., hospitals and universities) is much more complex and includes:

- Widespread routine deferral of annual maintenance and repair to meet short term budgetary and fiscal limitations, the costs of which increase exponentially with the period of deferral.

Urban Sprawl rather than intensification of land use: the expansion of municipalities outward to meet population growth rather than intensification thus requiring new infrastructure rather than utilizing existing capacity.

- Inconsistent public accounting , financial regulations and policies which:
  - Do not recognize the full economic life cycle costs of investment alternatives and decisions.
  - Do not permit proper asset cost accounting and reserve funding at the federal and provincial levels. The mechanisms are in place for municipalities to set aside reserves for asset management if they chose to do so.
  - Do not promote the necessary political will to sequester maintenance and recapitalization funding in annual budgets.
  - Do not link costs and consumption through consistent user fees for services where such models could be beneficial. This generally occurs where the full economic costs are not being levied from those who consume the services (e.g., many municipalities continue to fund water and sewer charges from general revenue or special taxes not linked to levels of consumption).
- Until recently, targeted funding by federal, provincial and territorial governments for municipal infrastructure assets that skewed investment decisions towards specific types of projects that may not have been the most critical investment needed by a municipality.
- Inconsistent asset management practices and information systems to ensure decision makers understand and address asset investment requirements. Many municipalities, through limitations of staff and money, lack the internal capacity to assess the state of their infrastructure. A significant percentage report that they have no information on the condition of their assets nor do they have any programs to collect condition or capacity information.



**From the June 2013 Toronto Magazine:**

“The cost of policing has gone up an astonishing 80 per cent in the past 13 years, far outstripping increases in population, inflation, police personnel and municipal taxes. City hall spends more than a quarter of its property tax revenues on police, and it has had to starve other city services as a result. Last year’s budget was \$1.013 billion, more than the Ontario Provincial Police’s budget.”

- Until recently, the unwillingness to use alternative public asset investment financing and delivery models that use increased participation of private sector partners;
- Public sector labour rates that consume municipal budgets (see text box above).
- Investment in politically appealing assets, such as professional sport venues, that divert resources and attention from core asset investment.

Unfortunately, the situation is likely to worsen. Not only will population growth and urbanization increase our infrastructure needs, but climate change is reducing the life cycle of roads, storm sewers and sanitary sewers. Such increasing burdens will only make timely maintenance and rehabilitation an even more pressing need. Engineers Canada, the Insurance Bureau of Canada and others have been warning that the pattern of more extreme weather conditions is damaging and destroying infrastructure. New infrastructure will need to be more robust and resilient, and more expenditures will be required to repair damages to existing assets.

The expected increased burden on our infrastructure assets underscores the need for proper asset management plans. Unfortunately, this is an area where Canada does not have a strong track record. Many jurisdictions across the country have a poor understanding of the state of their current infrastructure stock. This discrepancy makes proper long-term infrastructure planning and management even more difficult.

Public infrastructure in general has not been optimized for its life cycle nor has it been appropriately maintained. One of the primary reasons for this is the lack of political rewards for undertaking routine maintenance and rehabilitation.

“... I will say right at the outset that every government does a terrible job of managing its assets, so that’s a given. We are no better than most former communist countries in that regard, and there are lots of reasons why. I think that now many of the assets have been so badly managed over the period of time that we have to do something about it. I think the problems we face in Canada are no different from those faced by Australia or the U.K. or France or Switzerland, etc., and now we see the problems in emerging economies.”

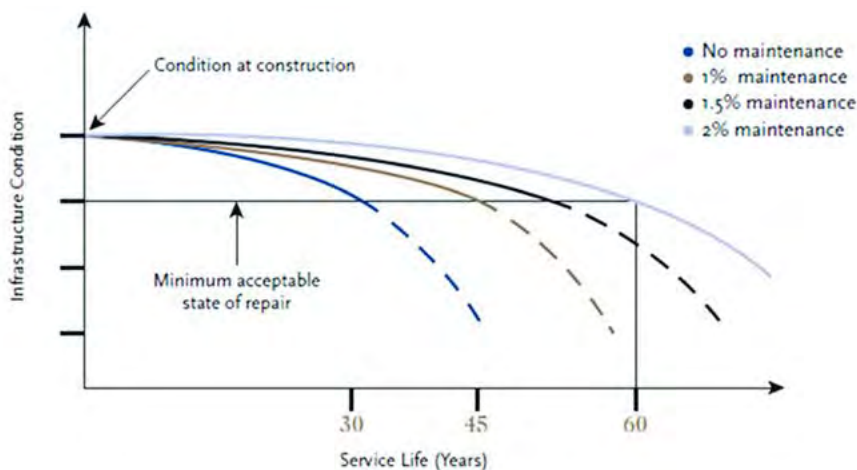
Professor James McKellar, Associate Dean and Director of the Real Estate Program at Shulich School of Business, testifying before the Canadian House of Commons Operations and Estimates Committee on May 1, 2007

### The Need for Asset Management Plans

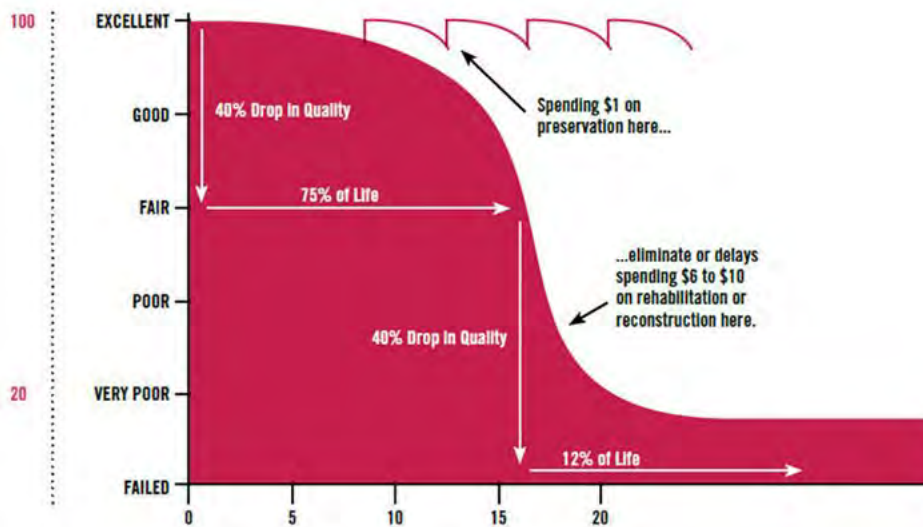
Effective asset management requires the ongoing assessment of an asset’s condition, the need for repairs, rehabilitation or replacement. Asset management also includes the timely use of preventative maintenance to avoid substantially higher repair costs at a later date. Good asset management is the subject of extensive

documentation and software systems, but the principles are simple. Early effective maintenance will extend the useful life of facilities (Graph 6), and the payback from investing in repairs and rehabilitation can be dramatic (Graph 7).

**Graph 6**  
**INFRASTRUCTURE CONDITION AS DETERMINED BY MAINTENANCE INVESTMENTS<sup>28</sup>**



**Graph 7**  
**MAINTENANCE EXPENDITURES AS A FUNCTION OF DESIGN LIFE**



Failure to maintain roads, bridges and ports can result in expenditures six to 20 times the cost of scheduled maintenance.<sup>15</sup> The extent of maintenance of infrastructure can be as important as the level of infrastructure in contributing to growth.

Asset management has traditionally been poor at all levels of government, but there is a new awareness of this and of the importance of effective asset management. Perhaps recognizing this need, Ontario municipalities moved to accrual accounting in 2009. In this model, an asset's cost is spread over its service life and recorded annually as an amortization cost. Full accrual accounting also depreciates the asset over its life. A municipality that is not spending to maintain its capital base will show a declining value of assets. The federal government has also adopted accrual accounting with the same potential impacts.

Good asset management starts and ends with the careful and proper definition of the initial and continuing underlying public program needed for the assets in question. The National Executive Forum on Public Property (representing about 30 public sector member organizations from all levels of government) has started a benchmarking initiative among members to illustrate best practices. This initiative will also provide respective governments with consistent comparative data on infrastructure funding requirements.

There are other signs of progress. In the 2013 federal budget, the federal government increased and extended the P3 Canada program. The federal government also indicated it would be encouraging recipient municipalities to undertake life-cycle assessments and develop asset management plans.

Similarly, recent Ontario budgets have noted that the province will require asset management plans from organizations seeking provincial capital, including municipalities and universities. Alberta has also increased its emphasis on the need for better asset management by developing software for municipal asset management that it sells to small municipalities.

While these signs of progress are encouraging, the implementation of asset management at the municipal level will be a lengthy process. Without significant political support at all levels of government, progress will remain slow. The federal government should continue to show leadership by supporting the development of asset management plans at both the provincial and municipal levels. Such support should go beyond merely funding to focus on capacity building at the earliest stages of project development.

## Recent Signs of Progress

Thankfully, the outlook is not completely grim. The federal government has taken several helpful steps in recent years to put Canada back on track.

As a response to the recent recession, the federal government created an economic recovery plan that included substantial contributions to municipal infrastructure. Importantly, several of these initiatives are intended to remain in place after the economic recovery to assist municipalities in achieving better outcomes in maintaining and replacing public infrastructure. These enduring federal investments include:

- \$1.25 billion per year through the Building Canada Fund (recently extended to 2023).
- \$2 billion per year through the Gas Tax Fund (now permanent and indexed at two per cent).

Canada has to improve how it tracks and maintains its infrastructure stock. Federal infrastructure investments should foster the capacity of communities to plan, build and maintain infrastructure assets over the long term.

### Recommendations

The federal government should encourage improvements and adherence to sound asset management policies and practices at all levels of government.

Governments across Canada should recognize the benefits of full economic cost accounting and accrual accounting at all levels of government.

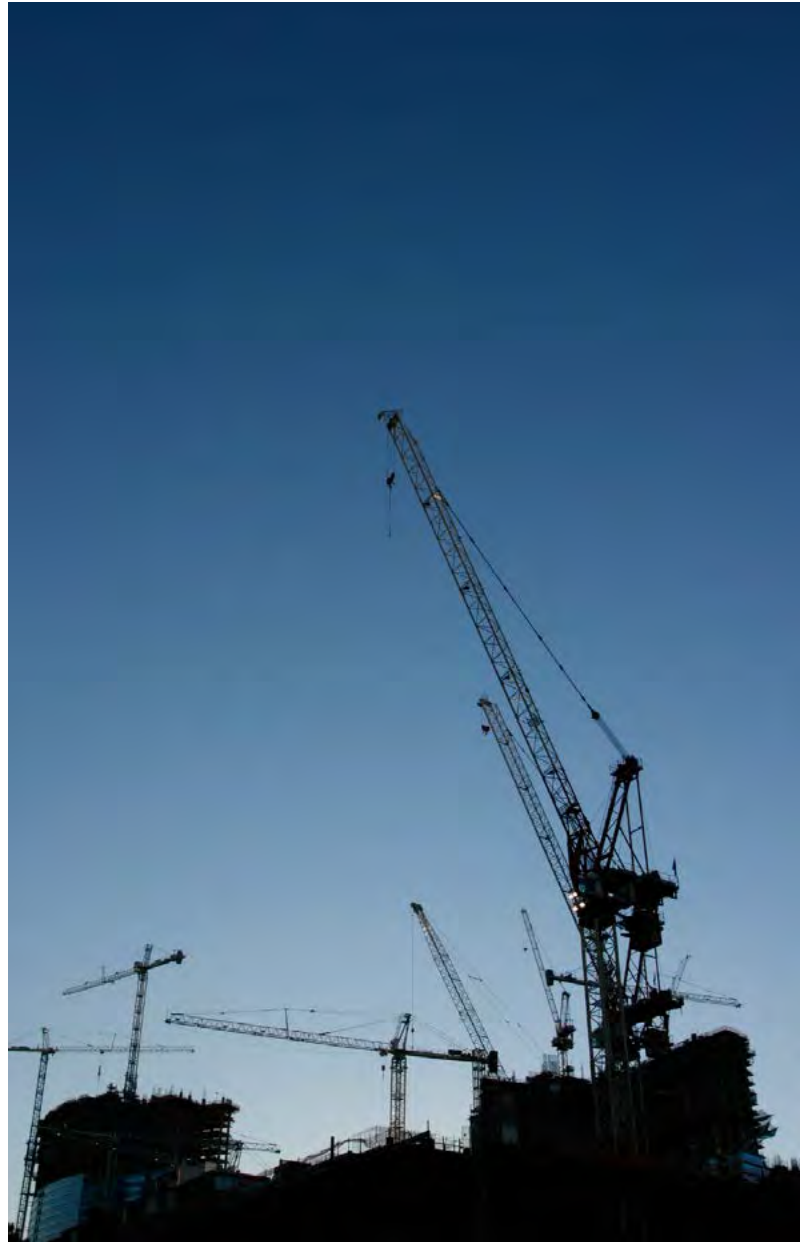
- \$800 million per year through the municipal GST rebate.
- \$400 million in dedicated transit funding (expired in 2010).
- P3 Canada, which exists to encourage the use of public private partnerships (PPP or P3) in infrastructure projects at the federal, provincial, territorial, municipal and First Nations levels, funded at \$1.25 billion until 2018.

There has also been movement at the provincial level. Many of the provinces have implemented their own short-term stimulus programs and have also acknowledged the need for more sustained investment in public infrastructure. Ontario, for example, increased its infrastructure spending from a level of \$2.6 billion in 2003-2004 to \$14.1 billion in 2010-2011.

### Challenges in Infrastructure Investment

Although governments at all levels are starting to recognize the linkage between infrastructure investment and economic growth, the way forward will not be easy. The hurdles extend well beyond political will including:

- **Catch up is harder than keep up.** Once investment has lagged behind need for 30 years or more, very high levels of investment are needed to catch up—more than is readily available for public spending.
- **Structural issues.** Governments do not establish sinking funds to finance repair and rehabilitation.
- **Fiscal imbalance.** Despite being responsible for the majority of public infrastructure assets, Canadian municipalities only receive eight per cent of taxes.
- **Resistance to private investment.** There are barriers to bringing more private investment in public infrastructure in Canada, including union resistance and subsidies for land development and utilities that hide the real costs of public investment.



# III. TAKING ACTION TO IMPROVE INVESTMENT LEVELS

*“Equally as important as money and methods is our message. There is a clear need to change the way we talk about infrastructure, its role in ensuring ...competitiveness and strong communities, and the importance of everyone – governments, advocacy groups, nonprofits, private-sector actors and taxpayers – to contribute. In the past, government has largely carried the burden of asking for more taxes and user fees. Moving forward, we’ll need businesses, both big and small, to play a critical role in making the case to the public for both traditional infrastructure, such as roads and bridges, as well as innovative infrastructure, such as broadband, smart electrical grids and construction that encompasses and enhances energy efficiency.”*

Judith Rodin and John Kitzhaber, *Raising the Grade on Infrastructure: Money, Methods and Message*

## Requirements for Enhanced Investment

There are two requirements for enhancing investment levels in public infrastructure: increasing the levels of investment and increasing the effectiveness of investments in infrastructure.

### Increasing the Availability of Public Funds

In order to meet the huge bulge of required investments, Canada needs to increase infrastructure investment levels and subsequently maintain these higher levels into the future. Doing so will not be easy. First, we will have to change the dialogue with the general public. Canadians from coast to coast have to understand the importance of infrastructure investment and the allocation of increased public funds. The message should shift away from “catch-up investments” to “investing in the prosperity of our country.”

Second, all levels of government should continue the shift to accrual accounting. Accrual accounting exposes a failure to reinvest and provides decision makers and the public with the information needed to monitor infrastructure investment levels.

Third, Canada needs a durable mechanism for cost sharing by higher levels of government in municipal capital programs. Funding levels will have to be predictable over a long-term time horizon to enable infrastructure investment decision making.

Fourth, Canada has to examine more seriously the viability of user fees for public utilities that would shift some of the burden away from tax revenues. Such a shift has the potential to provide additional efficiencies. For example, in many jurisdictions, utilities and land development are cross subsidized from general property taxes. The lack of full cost recovery through user fees is making funding obscure and causing bad consumer and investment decisions. The shift towards user fees could also encourage sustainability by limiting wastage. For example, Environment Canada reports that non-metered customers consume 60 per cent more water on average than metered customers.

Fifth, Canada should examine areas where outright privatization could be beneficial. Privatization has the potential to not only attract private capital for infrastructure investment but can also free up public capital for reallocation. For example, the privatization of the large Canadian airports that are currently on a ground lease with the federal government would not only ensure all future investments were private but would yield a minimum of \$5 billion to the

federal government for use on other infrastructure projects. One key advantage of privatization is the potential for economies of scale across several political jurisdictions. In comparison to numerous, small municipal utilities providing water, for example, a private entity can operate and finance water treatment and distribution in multiple jurisdictions, creating efficiencies in both operations and capital investment. This regional private utility service company model has been universally used for water, sewer and electrical generation and distribution in the entire U.K. since the 1990s.

A key disadvantage of the privatization of utilities in monopolistic position is the need for an economic regulatory environment and a structure to monitor performance.

### The Need for Innovative Funding Models

Even with the changes mentioned above, the required investments will exceed the availability of public funds. Many countries face the same challenge as Canada and have begun to examine alternate financing models. Some of the options that could be worth considering include:

- **Tax increment financing.** Under tax increment financing, a specific project or a district is granted a share of the incremental taxes that occur as a result of the development. In terms of infrastructure, it is most applicable to rapid transit development where increases in property values and densities near new stations can dramatically increase tax revenues. It is specifically enabled in Ontario and Manitoba and has been used for brownfield developments. It has been extensively used in the U.S. but is somewhat controversial, with opponents arguing that it is a subsidy for private development.
- **Credit guarantee finance.** In the United Kingdom, the Treasury launched a program called Credit Guarantee Finance (CGF) to reduce the costs of borrowing to finance private finance initiative (PFI) schemes. Under the credit guarantee program, the government provides funds to the PFI project through cash advances governed under the terms of a loan agreement. The private firm repays these loans to the government after completing the project. The government receives an unconditional repayment guarantee from the private financier for providing this loan facility in return for a fee.<sup>15</sup>
- **National infrastructure bank.** This model has been proposed in the United States. One proposal is to fund \$30 billion in public loans over 10 years to leverage an additional \$130 billion in private funds. The concept is that the national infrastructure bank would be particularly effective in large projects where public-private partnerships are needed to bring large capital projects to fruition. This would be different from Infrastructure Canada in that it would be at arm's length from direct political control and would be "seeded" with public funds—but would bring other investors and lenders to the table. It is likely that legislation would be needed to create such an entity and provincial support might be required if the bank was investing in areas of provincial jurisdiction.

## Recommendations

- There is a need for increased dialogue with the public and other stakeholders to highlight the importance of effective infrastructure to economic growth. Such dialogue will set the stage for public acceptance of the need for these higher levels of investment.
- All levels of government should emphasize the importance of full economic cost accounting and accrual accounting.
- A long-term, predictable infrastructure plan should include a durable mechanism for cost sharing by higher levels of government in municipal capital programs.
- Canadian governments should undertake a serious examination of the viability of user fees and other innovative funding models.

- **Provincial or city infrastructure trusts/banks/ revolving funds/utility corporations.** There are a wide variety of models in the U.S. of state or city funding mechanisms independent of general revenue. For example, Chicago has created an infrastructure trust. The mandate of this not-for-profit trust is to bring a mix of public and private investment to infrastructure projects. Investors are repaid and earnings are returned from revenue gains or from cost savings from specific projects.

The trust's board of directors is comprised of a mix of city politicians and private sector individuals nominated by the mayor. It is only quasi-independent in that it must conform to municipal procurement rules. Although it cannot borrow in the city's name, it must have city approval for all projects affecting city funds, zoning changes, land acquisition or any other area of governance that the city currently controls.

New York State has also established an infrastructure bank to finance capital works, primarily transportation projects such as bridge replacement. One feature of the bank is that it is intended to coordinate capital spending among 45 agencies and authorities, including the state Department of Transportation, the New York MTA, the Port Authority of New York and New Jersey, the Thruway Authority, the Department of Environmental Conservation and others. The governing body will prioritize and coordinate state projects. The coordination may, in itself, make infrastructure investment more effective and efficient. It has started with new spending of \$1.2 billion, consisting of \$247 million in state capital funds and \$917 million in new federal funds. When it is fully constituted, the fund is supposed to draw in private capital. From a Canadian perspective, a key point of interest is that the funding is a mix of federal and state funding, with the potential of additional private funding.

- **Tax exempt bonds.** Although somewhat controversial, tax exempt bonds continue to enjoy strong support in the United States and are widely used for municipal infrastructure. Supporters believe that in the absence of new federal money, tax exempt bonds are a good way to attract additional private investment. Opponents claim tax exempt bonds are an inefficient and costly federal subsidy as 10 per cent to 20 per cent of the subsidy is taken by individual bond holders in upper income tax brackets.<sup>10</sup> Due to this discrepancy it is likely that there would be federal resistance to this approach in Canada.
- **Local not-for-profit asset corporations.** The airport authority model in Canada is a model of a local not-for-profit corporation with the ability to finance, operate, maintain and develop airports. The translation of this model to water or wastewater infrastructure could open new avenues for investment.
- **Locally voted project specific financing.** The U.S. experience has been that if a specific, locally beneficial package is put to voters, it will typically be approved. A 73 per cent approval rating for this type of project specific funding, whether public or private, has been achieved in the U.S.<sup>15</sup> These are often funded by locally voted (through referenda, not general elections) sales taxes. Enabling locally voted sales taxes in Canada would open new financing opportunities.
- **Expansion of the use of P3s.** Development of programs and structures to bring in more private sector involvement in the financing, development, operation and maintenance of public capital assets through public-private partnerships (P3s).

## Private Investment in Public Infrastructure: The Case for P3s

Increasingly, governments have also been outsourcing investment in infrastructure, asset management and maintenance functions to private firms through public-private partnerships (P3s). The use of P3s in Canada is relatively new but is already extensive and increasing. The federal government and all the provinces and Nunavut have P3 projects completed or underway in a variety of sectors.

Private investment in public infrastructure can take many forms. In the most traditional models, design and construction are typically undertaken by the private sector. When P3s are being discussed, however, it is the newer models of private involvement that are the subject – from design-build-operate through buy-build-operate. In these models, the private partner finances, designs, builds and operates the facility for the life of the contract. At the end of the contract period, the infrastructure, fully maintained, reverts to the government partner. While other countries, such as the United Kingdom and Australia, pioneered the concept of alternative financing procurement, Canada has since become a P3 leader and has in many ways surpassed the trailblazing P3 countries. In fact, all of the big European players are active in the Canadian market.

One challenge in Canada is that the market is fragmented into many smaller markets. To be really active in a market, P3 bidders need a reliable potential project pipeline, without the risk that a change in politics will re-direct approach to publicly financed and operated projects. Despite the fragmented nature of the Canadian market, it remains attractive to investors. As of November 2011, half of the P3 concessions that had reached financial close in 2011 used long-term publically rated bonds, and new issues are oversubscribed.<sup>13</sup> Due in part to the standardized approaches to P3 delivery taken by Canadian provinces, and the very positive response to P3s in the Canadian capital markets, the Canadian P3 market is now known as a whole to be one of the most stable in the world.<sup>13</sup>

P3s have longer and costlier development periods for both public and private participants. Nonetheless, these costs are being reduced in Canada. Local law firms are becoming more familiar with the transactions, and tested templates are used on all but the most unique projects. According to Professor James McKellar, Canada has been relatively successful in reducing these costs. Over the years, we've been able to improve inter-jurisdictional lesson sharing and the development and sharing of legal templates. Transaction costs are now on average about 20 per cent of what they used to be. More experience with P3s in each infrastructure area could further reduce these costs. If conventional projects were subject to a similarly rigorous process, it is anticipated that the costs would be comparable.

An analysis of project data does not show a trend toward smaller deals in Canada as transaction costs are reduced. Of the 68 projects since 2005 for which agreement cost data are readily available, 62 exceeded \$60 million.<sup>13</sup>

According to the May 2013 edition of *Infrastructure Investor*, a survey of 62 institutional investors (representing \$1.9 trillion of capital) indicated that infrastructure is at the very top of their shopping lists. If projects or infrastructure firms of the right scale and return were available for investment in Canada, the funds would likely be available to finance these ventures.

### A Growing Trend

The Canadian government was an early leader in the adoption of P3s. Its Confederation Bridge project stands as a perfect example of a benchmark P3. While it is a relative neophyte with respect to more specialized infrastructure, there are a few significant projects underway. As examples, the new Communications Security Establishment Canada high security headquarters in Ottawa and the concessionary arrangement to finance, provide, manage and maintain all infrastructure for RCAF's primary flight training in Moosejaw, Saskatchewan.

At the provincial/territorial level, Ontario and B.C. appear to have developed the most P3 projects. In fact, infrastructure Ontario has used the P3 model to bring to market more than 50 projects valued at close to \$21 billion in capital construction.

Private investment in infrastructure is growing at the provincial level. B.C., for example, requires all projects over \$20 million to be put through a P3 screen.

Although municipalities have been the least active in P3s, there has been recent growth. From 2009 to 2012, there were 15 municipal projects that reached the procurement stage.

## The Benefits of P3s

While P3s are by no means the only solution to Canada's infrastructure financing needs, they do offer numerous benefits. First, there is increasing evidence that P3s are providing a value for money (VfM) benefit when compared to conventional procurement. Public projects frequently are characterized by cost overruns. A study of public projects around the world showed that public bridge projects overrun budgets by an average of 33.8 per cent and public roads projects overrun by an average of 20.4 per cent.<sup>39</sup> A U.K. Treasury report in 2000 found that among a sample of 29 P3 projects for which public sector comparisons were available, the average savings through P3 were close to 17 per cent.<sup>15</sup> Similarly, the P3 delivery of the E470 toll road in Colorado reduced the capital costs by 32 per cent.<sup>15</sup>

The Canadian experience has been that P3s provide a 10 per cent to 15 per cent VfM benefit, with the likelihood that the gap will increase as transaction costs decline.

Importantly, the VfM calculation takes into consideration that the private sector will normally pay a higher rate for borrowings than governments. For example, the Communications Security Establishment

Canada (CSEC) Long-Term Accommodation Project was financed by a two-part bond offering, with both achieving "A" ratings by DBRS. The financing was priced at a spread of 115 bps for the short-term bond (covering the construction period) and at 200 bps for the long-term bond (covering the O&M phase of the projects).<sup>13</sup>

The VfM experience is being repeated in Ontario, with the Alternative Financing and Procurement Initiative (essentially a P3). This program contributes to on-time and on-budget project delivery and overall value for money because of the necessity to carefully define scope risks and strategies. It also requires the careful definition and output specifications as part of the P3 contracting process. Significant cost savings are realized even at the construction stage by avoiding "over-build", prevalent when conventional procurement enables over programming and over-design.

Proponents of P3s argue that the government's borrowing cost cannot be compared to private sector borrowing costs in evaluating the potential for benefits from P3s. The real comparison should be the risk weighted cost of capital for the government (including the risk of cost overrun) to private sector costs.



## Graph 8

### COST PERFORMANCE OVER PROJECT INITIATION AND DELIVERY<sup>40</sup>

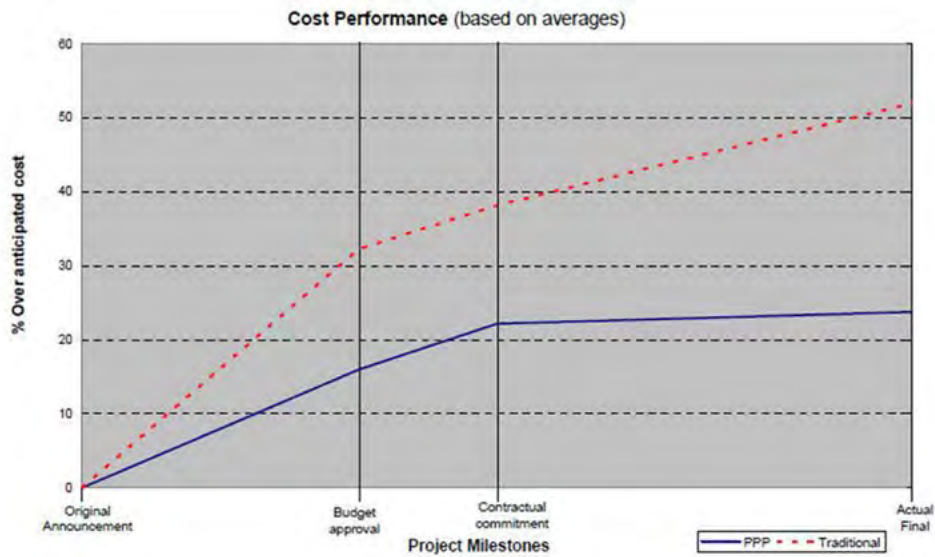


Figure S1: Cost performance over project initiation and delivery (source: Duffield 2008)

Second, P3s are financially transparent. Full economic life cycle costs are included in the contract and the financial payment and accounting systems. Maintenance and recapitalization funding is protected (ring-fenced) through such mechanisms as sinking funds. The transaction costs are valuable, as they bring experts to the table and help with clear project definition.

Third, asset management is a measurable, enforceable part of P3 contracts. In fact, one of the greatest strengths of P3s is that they include asset management plans. At the end of the contract, when the project is turned over to the public partners, it is done so in peak condition.

## The Downside of P3s

While useful, it is important to remember that P3s are not the only solution. They are, by no means, applicable to all projects, and there are barriers to widespread application. Some of their limitations are outlined below.

First, P3s are generally complex and inflexible. The inherent complexity of P3 structures can, when structured inappropriately, lead to unforeseen effects or distorted incentives. P3s are long-term contracts (as long as 50 years) and can be more difficult to adapt to changing governmental, societal or policy requirements. Incredible client discipline is required at the front end to provide technical and program performance standards and criteria. This is relatively easy on cookie cutter projects, such as schools, but gets more difficult with complex multi-function facilities like hospitals. Furthermore, as P3s become more numerous, the pool of government owned directly funded infrastructure gets smaller. Thus, when periodic restraint programs demand spending reductions, these reductions must come out of a diminished non-P3 infrastructure funding pool. This, in turn, further accelerates the deterioration of that infrastructure.

Second, P3s are not always a good solution if there are high and undefined levels of risk, such as underground rapid transit lines. However, sophisticated risk allocation strategies can and have been used to make P3s feasible in this environment. Still, not all projects will be attractive to investors due to slow returns on projects in remote or rural areas. This does not mean that such projects should not be built as they could still present broader economic, social or security benefits.

Third, there is often a lack of expertise for P3s at the municipal level. For example, roughly half of the applications for the first wave of P3 Canada funding were not P3 projects, reflecting the lack of knowledge on the part of many municipalities. More recent applications have not suffered from the same problem,

highlighting the growing familiarity.<sup>13</sup> One of the goals of P3 Canada, Partnerships BC, and Infrastructure Ontario is to provide a centre of expertise to help build capacity in government departments and among their client proponents. P3 Canada does make funding contingent on having a proponent team with sufficient capacity.

Finally, there is real political resistance to embrace P3s in a manner found in several other countries. There are several reasons for this hesitancy, including the fact that governments may face political backlash if a project does not proceed as intended. In these cases, the government may be required to step in to achieve the public policy benefits the project was designed to achieve. Perhaps unsurprisingly, governments (particularly at the municipal level) remain hesitant to examine P3s as a viable option. In comparison to the U.K. and Australia, and even Chile, Canada remains ambiguous about its commitment to the P3 model. This resistance is largely driven by a political fear over what is commonly referred to as “privatization.”

Governments may reflect opposition to P3s by certain sectors of civil society. For example, there have been numerous examples of strong union resistance to P3s, particularly at the municipal level. A well-known case involved a municipal election in Abbotsford, B.C. and a potential P3 water project. In the end, 74 per cent of voters rejected the P3 and the mayor was defeated in favour of a first time politician who opposed the P3.<sup>13</sup> Most recently, a strong, union-led disinformation campaign was waged in Regina. Called *Save our Water*, this campaign forced a referendum on a P3 sewage treatment plant. The outcome of the referendum was 57 per cent support for the P3. It is important to note that not all unions oppose P3s, and some construction unions recognize that access to private capital for public infrastructure means more projects.

## Conclusion

P3s are a valuable tool but must remain merely one tool at our disposal. They will not address the fundamental political questions of sufficient overall infrastructure funding. Although the use of P3s is increasing in Canada, there is clearly a need to bring additional capital investment into public infrastructure to catch up from past underinvestment and to keep up in the future. Financial institutions and advisors in Canada and elsewhere have been working on developing P3 models that are applicable to a wider variety of projects, including bundling, risk sharing, competitive partnerships, incremental partnerships and the use of integrators.

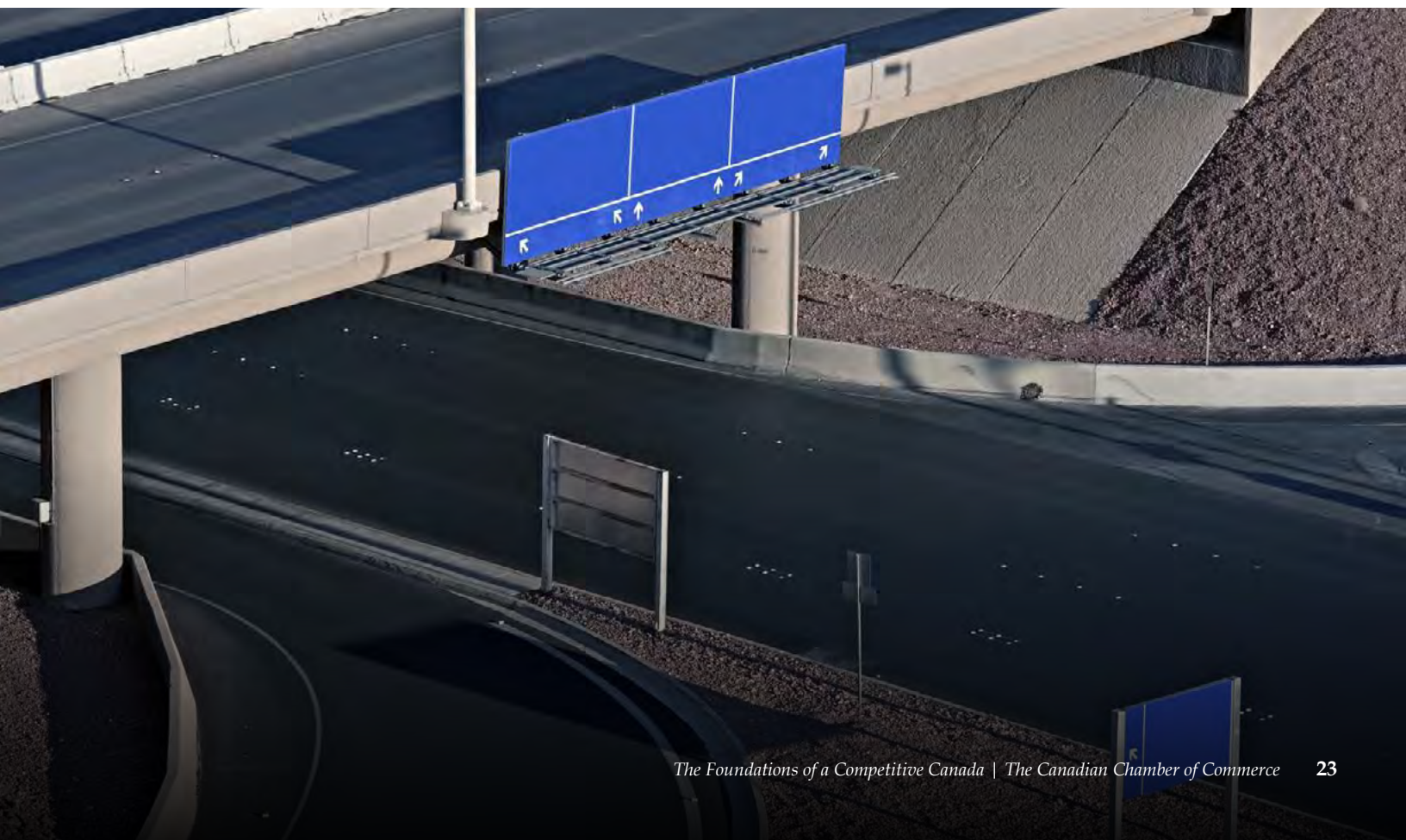
Even with a slew of alternate funding options, a specific approach needs to be tailored to each location and circumstances. Regardless of the funding and operation model used, in the end, either the users pay or the taxpayers pay. The method of financing and operating is a question of access to capital and efficiency in delivery.

## Recommendations

The federal government should provide technical support to assist municipalities and provinces and territories with developing business cases to analyze the most effective financing model for a particular project.

All levels of government should ensure the relevant public sector employees are able to efficiently manage P3s and deliver quality P3 investment in a timely manner.

Promote the viability of P3 projects in mid-sized urban centers across Canada. This promotion should include specific messaging designed to address the concerns of potential opponents of P3.



## IV. MAKING INVESTMENTS MORE EFFECTIVE

The second opportunity for enhancing infrastructure investment in Canada is to make investments more effective. This can be accomplished through stronger emphasis on project definition, better asset management, more widespread use of P3s, bundling of smaller projects and consideration of new forms of public-private partnerships.

### Concrete Steps to More Effective Investment

A stronger emphasis on project definition would make all investments in public infrastructure more effective. The lesson learned from the on-time and on-budget performance of P3s is that all projects benefit from a complete project definition at the outset. The perceived relatively high transaction cost of P3s can be attributed to the full transparency of P3 cost accounting and to the rigour of the process, which reduces cost escalation and schedule risks going forward. If conventional public projects were subject to the same transparency requirements, the costs would be substantially lower.

**Improvements to value for money.** In addition to more clarity and detail in project definition, there are other measures for improving the value for money (vfm) of project infrastructure investments. For example, the West Coast Infrastructure Exchange, a non-profit entity created by B.C., Oregon, Washington and California is a coordinated effort to increase the value for money of investments in public infrastructure through:

- Identifying public project development and delivery methods that yield more measurable value for the public dollar while meeting public policy, accountability and transparency objectives.



- Creating and advancing new mechanisms for project finance, including those that could be attractive to private investors that have traditionally not invested in public infrastructure.
- Connecting investors to opportunities by providing consistent, comprehensive and high-quality data.
- Helping investors and project sponsors identify, understand and mitigate risk.
- Sharing and developing best practices as well as strengthening public sector capacity and expertise in these new approaches.
- Ensuring an estimated \$1 trillion in future West Coast infrastructure investment considers climate risk factors.

**Improved asset management** is important so that investments are not wasted on too-late rehabilitations that could have been prevented through timely repair and replacement. Recent actions by the federal government and provinces to promote asset management are a step in the right direction.

**More extensive use of P3s** will not only bring additional funds to infrastructure but also improve the performance of the investments. P3s are characterized by lower initial and life cycle costs, more rigorous project definition and payment over the design life of the asset, and built-in performance measures to ensure both asset management and service delivery.

**Bundling of similar projects within a single jurisdiction** could contribute to additional projects reaching a size that is more attractive to large investors. There is abundant private capital in Canada, but many municipal projects are simply too small to be considered for P3s. The federal government or provinces could help this market by creating standardized documentation for typical municipal projects. The U.K. has experience with such bundling through its *Building Schools for Tomorrow* program. To be successful, bundling requires that a single government body hold responsibility.

Similarly, the Ontario government has successfully bundled several smaller projects through Infrastructure Ontario (IO) to facilitate P3 delivery. According to IO, bundling of several projects with similar characteristics and risk profiles, and within a single program or political jurisdiction (e.g., several Ontario Provincial Police detachments), is the optimum scenario. IO has noted that it could be difficult to try to bundle several projects across more than one jurisdiction (e.g., several water treatment plants in neighbouring but independent municipalities) due to complex governance issues.

While bundling can be an attractive option, it is not without its opponents. For example, some municipal governments are concerned that local firms would be cut out of such projects as they are too small to bid on larger, bundled projects.

## Recommendations

That all levels of Canadian government apply an equal level of attention to project definition and delivery for conventional, publicly funded projects and for projects delivered by alternative structures, such as local utility corporations and authorities, and to P3s.

Examine ways to further improve the value for money of infrastructure projects.

Examine the feasibility of bundling similar projects within a single jurisdiction.

## V. CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Investment in public infrastructure is critically important to Canada's competitiveness and future prosperity. There is an indisputable strong link between investment in the core public infrastructure of roads, transit and utilities and productivity performance in all sectors of the Canadian economy. The success of Canadian business and the quality of life of our citizens depend on modern and efficient infrastructure. Due to years of low levels of infrastructure investment, Canada is now faced with a huge bulge of required investments.

Fortunately, there have recently been signs of progress. Federal funding for infrastructure has increased and more provincial and municipal governments are noting the linkage between infrastructure investment and productivity. It is critical that the current levels of investment in public infrastructure be viewed as a new sustained level of investment rather than short-term economic stimulus. A long-term plan for sustained, consistent, reliable investment in infrastructure by all levels of government is needed.

Permanent infrastructure funding is required, similar to "permanent" investment in healthcare, education, recreation and public safety. Infrastructure is what enables and underpins the economy and, therefore, quality of life. A strategic vision, along with a public dialogue that explains the importance of effective infrastructure to economic growth, will set the stage for public acceptance of the need for these higher levels of investment.

As a first step on the road to sustainable infrastructure investment, governments should consider policies to constrain growth in infrastructure demand. There is considerable precedent in the fiscal and regulatory reforms that have reduced demand for energy in transportation, residential and industrial sectors through conservation initiatives and the development of innovative technologies.

Notwithstanding the "capital" provided by conservation measures, there will be a continuing requirement to increase capital investment in infrastructure. At the same time, governments at all levels will continue to face opposition to increasing conventional fiscal revenues to supply this capital. There is a more than adequate supply and appetite in the private sector to bring infrastructure capital and management capacity to the table. However, lenders and operators will only provide this capital and expertise in a disciplined environment in which operational and financial risks are predictable and manageable.

In this regard, governments should also take steps to ensure that public investments are as effective as possible. This can be accomplished by focusing on core infrastructure, emphasizing project definition and encouraging better asset management.

---

*For further information, please contact:*

*Leah Littlepage | Director, Canada-U.S. & Transportation Policy | [llittlepage@chamber.ca](mailto:llittlepage@chamber.ca) | 613.238.4000 (250)*

## Summary of Recommendations

Although investment in public infrastructure has recently improved, there is more that could be done to ensure Canada does not fall back into a pattern of under-funding infrastructure.

Canada needs a long-term infrastructure investment strategy that:

- 1) Involves all levels of government in the development and implementation of this plan.
- 2) Includes sustained, consistent, transparent and reliable investment in strategic infrastructure by all levels of government. Infrastructure spending cannot be viewed as a short-term economic recovery plan. These investments must be viewed as a long-term commitment to our economic growth.
- 3) Includes a durable mechanism for cost sharing by higher levels of government in municipal capital programs.
- 4) Prioritizes public infrastructure investments that will result in net gains for the whole of the Canadian economy. This must include targeted investments in Canada's major economic hubs, gateways and public transit systems.
- 5) Applies an equal level of attention to project definition and delivery for conventional, publicly funded projects and for projects delivered by alternative structures such as local utility corporations and authorities, and to P3s.
- 6) Increases dialogue with the public and other stakeholders to highlight the importance of effective infrastructure to economic growth. Such dialogue will set the stage for public acceptance of the need for these higher levels of investment.
- 7) Is flexible enough to adapt to the evolving needs of our society without encouraging inefficiencies such as urban sprawl.
- 8) Continues to support institutions like P3 Canada, Partnerships BC and Ontario Infrastructure that are improving the delivery of public infrastructure projects at all levels of government.
- 9) Provides technical support to assist municipalities and provinces/territories on developing business cases to analyze the most effective financing model for a particular project.
- 10) Promotes the viability of P3 projects in mid-sized urban centers across Canada. This promotion should include specific messaging designed to address the concerns of potential opponents of P3.
- 11) Ensures all relevant public sector employees are able to efficiently manage P3s and deliver quality P3 investment in a timely manner
- 12) Encourages improvement and adherence to sound asset management policies and practices at all levels of government.
- 13) Maintains an emphasis on full economic cost accounting and accrual accounting at all levels of government.
- 14) Examines ways to further improve the value for money of infrastructure projects.
- 15) Examines the feasibility of bundling similar projects within a single jurisdiction.
- 16) Includes an examination of the viability of user fees and other innovative funding models.

# BIBLIOGRAPHY

1. Alan Arcand (Conference Board of Canada), *The Role of Canada's Major Cities in Attracting Foreign Direct Investment*, 2012
2. Bombardier Inc., *Public-Private Partnerships: Analysis of a financing model for transit infrastructure – Notes June 27, 2013*
3. Brox, James A., *Infrastructure Investment: The Foundation of Canadian Competitiveness*, IRPP Policy Matters, 2008
4. Canada West Foundation, *New Tools for New Times: Innovative Infrastructure Financing, Funding, and Delivery*, 2011
5. Canada West Foundation, *At the Intersection – The Case for Sustained and Strategic Public Infrastructure Investment*, 2013.
6. Canadian Centre for Policy Alternatives, *Canada's Infrastructure Gap – Where it Came from and Why it will Cost so Much to Close*, 2013
7. Canadian Electricity Association, *Maximizing Benefits in an Evolving Energy Landscape*, 2013
8. Canadian Urban Transit Association, *The Economic Impact of Transit Investment: A National Survey*, 2010
9. Canadian Urban Transit Association, *Transit Infrastructure Needs for the Period 2012- 2016*, 2012
10. Center for American Progress, *Meeting the Infrastructure Imperative An Affordable Plan to Put Americans Back to Work - Rebuilding Our Nation's Infrastructure*, 2012
11. CEOs for Cities, *The Changing Dynamics of Urban America*, 2004
12. Conference Board of Canada, *The Economic Impact of Ontario's Infrastructure Program*, 2013
13. Conference Board of Canada, *Canada as a Global Leader Delivering Value through Public- Private Partnerships at Home and Abroad*, August 2013
14. Cool Communities Group (Pembina Institute, Canadian Environmental Law Association, Ecojustice Canada, Zisso Allan Climate Law LLP), *Live Where You Go, Encouraging location-efficient development in Ontario*, July 2012
15. Deloitte LLP, *Closing America's Infrastructure Gap – the Role of Public-Private Partnerships*, 2007
16. Economist Magazine, 28 September, 2013
17. Ernst & Young, *Infrastructure 2012- Spotlight n Leadership, for the Urban Land Institute*, 2012
18. Federation of Canadian Municipalities et al, *Canadian Infrastructure Report Card – Volume 1:2012 Municipal Roads and Water Systems*, 2012
19. Federation of Canadian Municipalities, *FCM Analysis of Budget 2013*, 2013
20. Federation of Canadian Municipalities, *The State of Canada's Cities and Communities 2013*, May 2013
21. Infrastructure Canada, *Report on Plans and Priorities 2011-2012*, 2011
22. Infrastructure Funding Council (Manitoba), *New Relationships: A New Order A balanced approach to funding municipal infrastructure in Manitoba*, May 2011
23. *Infrastructure Investor*, June 2011 and 30 May 2013
24. International Transport Forum, *Funding Urban Public Transit, a Case Study Compendium*, 2013
25. McKellar, Prof. James, *A Primer on Public Private Partnerships*
26. McKellar, Prof. James, *Presentation to the Government Operations and Estimates Committee*, 1 May 2007
27. McKellar, Prof. James, *Risk Management: A Framework for Discussion, National Executive Forum on Public Property*, 15 April 2013
28. Mirza, Saeed, *Danger Ahead: The Coming Collapse of Canada's Municipal Infrastructure, for the Federation of Canadian Municipalities*, 207
29. National Roundtable on Sustainable Infrastructure, *Infrastructure Financing*, 2007
30. National Roundtable on Sustainable Infrastructure, *An Innovative Approach to Sustainable Infrastructure in Canada*, 2007
31. National Roundtable on Sustainable Infrastructure, *Innovation as a Solution*, 2007
32. National Roundtable on Sustainable Infrastructure, *Smaller Community Infrastructure*, 2007
33. Ontario Ministry of Infrastructure, *Building Together – Jobs and Prosperity for Ontarians*, 2012
34. Puentes, Robert and Thompson, Jennifer, *Banking on Infrastructure: Enhancing State Revolving Funds for Transportation*, Brookings-Rockerfeller Project on State and Metropolitan Innovation, Sept 2012
35. RBC Capital Markets, *Canada - Infrastructure Finance*, July 2013
36. Rodin, Judith and Kitzhaber, John, *Raising the Grade on Infrastructure: Money, Methods and Message*, <http://www.governing.com>, 23 May 2013.
37. Siemiatycki, Matti & Farooqi, Naeem, *Value for Money and Risk in Public-Private Partnerships*, *Journal of the American Planning Association*, 78:3, 286-299, 2012
38. Slack, Enid, *Funding Municipal Infrastructure in Canada: Challenges & Opportunities*, 2012
39. Statistics Canada, *Age of Public Infrastructure: A Provincial Perspective*, 2008
40. Statistics Canada, Wulong Gu and Ryan Macdonald, *The Impact of Public Infrastructure on Canadian Multifactor Productivity Estimates*, 2009
41. Statistics Canada, John R. Baldwin and Jay Dixon, *Infrastructure Capital: What is it? Where is it? How Much of It is There?*, 2008
42. University of Melbourne, *National PPP Forum – Benchmarking Study, Phase II Report on the performance of PPP projects in Australia when compared with a representative sample of traditionally procured infrastructure projects*, 2008

# APPENDIX - LIST OF INTERVIEWS

- Michael Bernstein, President and CEO, Capstone Infrastructure Corporation
- Nadege Adam, Manager, Government and Parliamentary Relations, Bombardier Inc.
- Claire-Anne Bundy, Account Executive, Infrastructure and Financial Services Group, Export Development Canada
- Cherise Burda, Ontario Director, Pembina Institute
- Ian Clapp, Vice President, Project Finance, Carillion Canada Inc.
- Scott Gibson, Director, Special Projects Development Section, Department of Transportation and Infrastructure of New Brunswick
- Tristan Laflamme, Executive Director, Canadian Marine Pilots Association
- Fergal Lalor, Director Canada, LeighFisher Inc.
- Chris Lorenc, Chair, Infrastructure Funding Council, and President, Manitoba Heavy Construction Association
- Cathie MacDonald, Convenor, National Executive Forum on Public Property
- John McBride, CEO, P3 Canada
- James McKellar, Associate Dean and Head of Real Estate and Infrastructure Program, Schulich School of Business, York University
- John McKendrick, Executive Vice President, Infrastructure Ontario
- Wendy Reuter, Director of Research and Technical Services, Canadian Urban Transit Association

*This report was made possible by the  
generous support of our sponsors*

---

*Diamond*



ASSOCIATION OF CONSULTING  
ENGINEERING COMPANIES | CANADA  
ASSOCIATION DES FIRMES  
D'INGÉNIEURS-CONSEILS | CANADA

**BOMBARDIER**  
the evolution of mobility

---

*Platinum*



CANADIAN MARINE PILOTS' ASSOCIATION  
L'ASSOCIATION DES PILOTES MARITIMES DU CANADA



---

*Gold*

**Bison Transport**  
**McKinsey and Co.**  
**Ontario Power Authority**  
**Port Alberni Port Authority**  
**Thunder Bay Port Authority**

**OTTAWA**  
420-360 Albert Street  
Ottawa, ON  
K1R 7X7  
☎ 613.238.4000  
☎ 613.238.7643

**TORONTO**  
901-55 University Avenue  
Toronto, ON  
M5J 2H7  
☎ 416.868.6415  
☎ 416.868.0189

**MONTREAL**  
709-1155 University Street  
Montreal, QC  
H3B 3A7  
☎ 514.866.4334  
☎ 514.866.7296

**CALGARY**  
PO Box 38057  
Calgary, AB  
T3K 5G9  
☎ 403.271.0595  
☎ 403.226.6930